BRAC Program Management Office East
Philadelphia, Pennsylvania

Final
Technical Memorandum – September 2019 Groundwater Sampling

Site 3 – Ninth Street Landfill Groundwater
(Operable Unit 10)

Former Naval Air Station Joint Reserve Base Willow Grove
Horsham, Pennsylvania

July 2020

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FINAL
TECHNICAL MEMORANDUM - SEPTEMBER 2019 GROUNDWATER SAMPLING

SITE 3 – NINTH STREET LANDFILL GROUNDWATER (OPERABLE UNIT 10)

FORMER NAVAL AIR STATION JOINT RESERVE BASE WILLOW GROVE
HORSHAM, PENNSYLVANIA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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Base Realignment and Closure Program Management Office East
4911 South Broad Street
Philadelphia, Pennsylvania 19112

Submitted by:
Tetra Tech
5700 Lake Wright Drive, Suite 102
Norfolk, Virginia 23502

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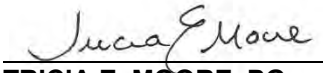
PREPARED UNDER THE DIRECTION OF:



TRICIA E. MOORE, PG
PROJECT MANAGER
TETRA TECH
KING OF PRUSSIA, PENNSYLVANIA

APPROVED FOR SUBMISSION BY:

STEVEN H. RUFFING, P.E.
PROGRAM MANAGER
TETRA TECH
NORFOLK, VIRGINIA

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Acronyms and Abbreviations

1,1,1,2-PCA	1,1,1,2-Tetrachloroethane
µg/L	Microgram per Liter
BRAC	Base Realignment and Closure
CASRN	Chemical Abstracts Service Registry Number
CF	Chloroform
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Contaminant of Concern
CTO	Contract Task Order
DCE	Dichloroethene
DOD	United States Department of Defense
DOE	United States Department of Energy
DON	United States Department of the Navy
FS	Feasibility Study
gpm	Gallons Per Minute
HAGS	Horsham Air Guard Station
HHRA	Human Health Risk Assessment
JRB	Joint Reserve Base
MCL	Maximum Contaminant Level
MDC	Minimum Detectable Concentration
MDL	Method Detection Limit
mrem/yr	Millirem per Year
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAS	Naval Air Station
NAVD 88	North American Vertical Datum of 1988

NAVFAC	Naval Facilities Engineering Command
OU	Operable Unit
PAL	Project Action Limit
PCE	Tetrachloroethene
pCi/L	Picocuries per Liter
PMO	Program Management Office
PQL	Practical Quantitation Limit
PRAP	Proposed Remedial Action Plan
PRG	Proposed Remediation Goal
Ra-226	Radium-226
RB	Rinsate Blank
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SDWA	Safe Drinking Water Act
Sr-90	Strontium-90
TB	Trip Blank
TCE	Trichloroethene
Tetra Tech	Tetra Tech, Inc.
U-238	Uranium-238
USEPA	United States Environmental Protection Agency
VC	Vinyl Chloride
VOCs	Volatile Organic Compounds

1.0 Introduction

The Technical Memorandum was prepared by Tetra Tech, Inc. (Tetra Tech) for the United States Department of the Navy (DON) Naval Facilities Engineering Command (NAVFAC) Base Realignment and Closure (BRAC) Program Management Office (PMO) East as part of Contract Task Order (CTO) WE04 under Comprehensive Long-Term Environmental Action Navy (CLEAN) contract number N6247016D9008. This report summarizes the methodology and analytical results of the September 2019 groundwater sampling event conducted at Site 3 – Ninth Street Landfill (Site 3) at the former Naval Air Station (NAS) Joint Reserve Base (JRB) Willow Grove located in Horsham Township, Pennsylvania. Groundwater sampling was performed in accordance with the Final Groundwater Sampling and Analysis Plan (SAP) (Tetra Tech, 2019a).

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2.0 Background

The former NAS JRB Willow Grove is in Horsham Township, Montgomery County in southeastern Pennsylvania, approximately 20 miles north of Philadelphia. The former NAS JRB Willow Grove (hereafter referred to as the Base) occupies approximately 900 acres. The Horsham Air Guard Station (HAGS) occupies approximately 200 acres of adjacent land to the northeast of the Base. Figure 2-1 shows the location of the Base and HAGS. The Base is composed of flat to slightly rolling terrain and is generally bounded by State Route 611 to the east, State Route 463 to the southwest, and Keith Valley Road to the north.

The primary mission of the Base was to provide support for operations involving aviation training activities and to train Navy reservists. The Base supported United States Department of Defense (DOD) tenants such as the Marine Reserve, Pennsylvania National Guard, and the Army Reserve; and shared facilities/services with the Air Force Reserve. The Base provided facilities, services, materials, and training in direct support of all assigned units. The Base was selected for closure by the BRAC Commission in recommendations that became law on November 9, 2005 and was officially disestablished on March 30, 2011. The base continued to provide services and facilities on a limited basis until September 2011, at which time it was transferred to the BRAC PMO and entered caretaker status. The Base is an inactive facility and environmental investigations and remediation at the Base are funded under the BRAC program.

Site 3 occupies approximately 9 acres and is located immediately north-northwest of Ninth Street along the western boundary of the Base (Figure 2-2). The Hangar Area, located east of the landfill area, is also included as part of Site 3. From approximately 1960 to 1967, Site 3 was used as a landfill by the Public Works Department and as an open disposal ground by various operations at the Base. The landfill disposal method consisted of burning the refuse and burying the residue in trenches. Reportedly, the landfill wastes consisted mainly of general refuse, but also included: paint wastes; paint stripper; trichloroethene (TCE); sewage sludge; petroleum, oils and lubricants; and industrial pretreatment plant sludge. After closure of the landfill, a salvage yard operated in the eastern portion of Site 3. Between 1980 and 1983, clean fill and construction debris were deposited in the area southwest of the storm water retention basin within Site 3.

Site 3 is divided in to two Operable Units (OUs) addressing soil and groundwater, known as OU6 (soils) and OU10 (groundwater), respectively.

Site 3 was previously investigated as part of the Preliminary Assessment /Site Inspection , and Remedial Investigation (RI)/Feasibility Study (FS) processes. A Human Health Risk Assessment (HHRA) for Site 3 was performed to evaluate risks to current and future human receptors potentially exposed to groundwater, surface soil, total (surface and subsurface) soil, surface water, and sediment; and was included in the Site 3 RI Report (Tetra Tech, 2011).

A radiological scoping survey was conducted in response to findings of a Historical Radiological Assessment for the Base. The final scoping survey report was submitted in March 2017 (Tetra Tech, 2017).

Results of the FS, incorporating the results of the RI and the radiological scoping survey, were submitted in the Site 3 Final FS (Tetra Tech, 2019b).

A Proposed Remedial Action Plan (PRAP) for Site 3 detailing the preferred alternatives for the remedial actions for OU6 (soil) and OU10 (groundwater) was developed and submitted as the Site 3 Draft Final Proposed Plan in January 2020 (NAVFAC, 2020). Proposed Remediation Goals (PRGs) for groundwater were developed using information from the HHRA and FS and included as part of the PRAP submittal. Groundwater analytical results from the September 2019 sampling event are compared to the PRGs for evaluation purposes. An evaluation of groundwater analytical results and additional details about the PRAP PRGs are provided in Section 5.

Detailed background information for Site 3, including a detailed site history and key submittals, a discussion of physical and hydrogeological characteristics and the conceptual site model can be found in the Site 3 RI Report (Tetra Tech, 2011) and Site 3 FS (Tetra Tech, 2019b).

3.0 Groundwater Gauging and Sampling

September 2019 groundwater gauging and sampling activities were performed in accordance with the Final SAP (Tetra Tech, 2019a). Sample locations were chosen to take advantage of the broad spatial distribution of existing wells, and to ensure comparability of data with previous investigations. All groundwater gauging and sampling activities were performed by Tetra Tech staff. Site 3 well locations are provided as Figure 3-1.

Prior to groundwater sampling activities, a synoptic round of groundwater gauging was performed on September 16, 2019. Depth to water measurements were collected from each of the 14 wells including in the SAP. Artesian flow conditions were observed at three monitoring well locations: 03MW03I; 03MW03SI; and 03MW04I. As described in the FS (Tetra Tech, 2019b), these monitoring well locations are screened within the confined bedrock zone underlying the site. Monitoring well location 03MW09O was gauged and found to be dry. Well construction details and groundwater gauging information from the September 2019 sampling event are summarized in Table 3-1. The gauging log sheet is included in Appendix A.

Groundwater flow directions beneath Site 3 were determined from the contouring of the static-water level elevations measured during September 2019 gauging activities. The groundwater elevation contour maps indicate that the groundwater flow direction beneath Site 3 differs between the unconfined and the confined groundwater zones. A pair of geologic transect figures included as part of the FS that show subsurface geology and hydrologic conditions, including the transition zone from unconfined to confined conditions, are included for reference as Appendix B.

A potentiometric surface map showing groundwater elevation conditions in the unconfined aquifer is provided as Figure 3-2. Groundwater at the water table and within the unconfined groundwater zone flows in an overall northwestward direction. The configuration of the water table appears to be a subdued reflection of the surface topography, as is typical for this area.

Potentiometric surface maps showing groundwater elevation conditions in the intermediate and deep zones within confined aquifer are provided as Figures 3-3 and 3-4, respectively. Groundwater in the intermediate confined zone flows in a generally northeast direction. Groundwater in the deep confined zone flows in a generally northward direction. The orientation of the piezometric contour lines for the confined groundwater zone is generally parallel to bedrock strike. This groundwater flow pattern may in part reflect steady-state drawdown conditions caused by an uncapped flowing

artesian well (73 feet deep) that is located off-base on private property, about 500 feet to the northwest of monitoring well cluster 03MW04.

Following groundwater gauging activities, groundwater samples were collected from 13 monitoring well locations between September 16 through 20, 2019. One monitoring well location, 03MW09O could not be sampled due to insufficient water within the well (dry well).

Groundwater samples were collected using United States Environmental Protection Agency (USEPA) low-flow methodology, except for two monitoring well locations (03MW03SI and 03MW04I), which were sampled using volume purge methodology due to artesian flow conditions. Artesian flow of approximately 2 gallons per minute (gpm) and 5 gpm were observed at 03MW03SI and 03MW04I, respectively. Monitoring well location 03MW03I also exhibited artesian conditions during gauging activities, but the artesian flow rate was minimal enough to collect the groundwater sample using low-flow methodology. Groundwater sampling logs are included in Appendix A.

Groundwater quality field parameters including pH, specific conductance, temperature, dissolved oxygen, oxidation-reduction potential and turbidity were collected at monitoring well locations during purging to ensure sampling conditions were stable prior to collecting the sample, and to provide additional groundwater characterization data. Groundwater quality parameters collected during the September 2019 sampling event are summarized in Table 3-2.

Samples were placed in laboratory-provided containers, preserved as required per analytical methods, stored on ice, and transported under chain-of-custody to ALS of Middletown, Pennsylvania. This laboratory is approved by the DOD Environmental Laboratory Accreditation Program and certified by the State of Pennsylvania. All samples were analyzed for the following parameters, as outlined in the SAP (Tetra Tech, 2019a):

- Volatile organic compounds (VOCs) via SW-846 8260C.
- Total metals via SW-846 6020/7470A.
- Radium-226 (Ra-226) via USEPA 903.1.
- Strontium-90 (Sr-90) via HASL300 and United States Department of Energy (DOE) Sr-02.
- Uranium-238 (U-238) via HASL 300 and DOE U-02.

4.0 Quality Assurance/Quality Control Sampling

Field quality assurance/quality control samples collected during the September 2019 sampling event included blind duplicate samples, matrix spike/matrix spike duplicate (MS/MSD) samples, equipment rinsate blank (RB) samples and trip blank (TB) samples.

Blind duplicate samples were collected at a rate of one per 10 field samples. Two blind duplicate samples were collected during the September 2019 event.

MS/MSD and RB samples were collected at a rate of one per 20 field samples. One MS/MSD and one RB sample were collected during the September 2019 event.

TB samples were collected at a rate of one per sample cooler containing samples collected for VOC analysis. Three TB samples were collected during the September 2019 event.

Blind duplicate, MS/MSD and RB samples were analyzed for the following parameters, as outlined in the SAP (Tetra Tech, 2019a):

- VOCs via SW-846 8260C
- Total metals via SW-846 6020/7470A
- Ra-226 via USEPA 903.1
- Sr-90 via HASL300 and DOE Sr-02
- U-238 via HASL 300 and DOE U-02

TB samples were analyzed only for VOCs via SW-846 8260C, as outlined in the SAP (Tetra Tech, 2019a).

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5.0 Data Evaluation

The groundwater analytical results of the Site 3 September 2019 groundwater sampling event are presented in the following sections. Historical results from previous groundwater sampling events conducted in 1991, 1997, 2008, 2009, 2010 and 2017 are referenced and used for trend analysis where appropriate. Laboratory analytical reports are provided as Appendix C. Data validation reports are provided as Appendix D.

5.1 Reference Limits

Groundwater analytical results presented in this report were compared to both the PRGs included in the PRAP (NAVFAC, 2020) and the Project Action Limits (PALs) defined in the Final SAP (Tetra Tech, 2019a).

Groundwater PRGs, developed using data from the RI and HHRA, are the primary reference criteria for Site 3. The Site 3 PRAP established that tetrachloroethene (PCE) and its degradation products TCE, cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), 1,1-dichloroethene (1,1-DCE) and vinyl chloride (VC) are the only contaminants of concern (COCs) within Site 3 groundwater (NAVFAC, 2020). PRGs included in the PRAP are provided in Table 5-1, below.

Table 5-1: Groundwater Proposed Remediation Goals

Analyte	Proposed Remediation Goal (µg/L)
Tetrachloroethene	5
Trichloroethene[1]	5
cis-1,2-Dichloroethene[1]	70
trans-1,2-Dichloroethene[1]	100
1,1-Dichloroethene[1]	7
Vinyl Chloride[1]	2

[1] – These chemicals are degradation products of PCE and are included as COCs.
µg/L – Micrograms per liter.

Groundwater PALs are the secondary reference criteria for Site 3 and are used to monitor concentrations of additional analytes (VOCs, metals, radionuclides) that are not considered groundwater COCs in the PRAP to ensure that the proposed remedial action remains protective of human health and the environment. PALs are included in a summary table provided as Appendix E.

September 2019 groundwater analytical results compared to applicable PRGs and PALs are provided as Tables 5-2 and 5-3, respectively. Historical groundwater

analytical results compared to applicable PRGs and PALs are provided as Tables 5-4 and 5-5, respectively.

5.2 VOCs Analytical Results Compared to PRGs

As shown in Table 5-1, PRGs have been proposed for six VOC COCs. This section discusses the results from the September 2019 sampling event in comparison to the PRGs proposed in the PRAP (Table 5-2). Groundwater concentrations of analytes in exceedance of PRGs are shown on Figure 5-1.

Concentrations of PCE ranged from non-detect to 7.3 micrograms per liter (µg/L) (03MW03SI), and were detected above the laboratory method detection limit (MDL) in 9 of 13 wells sampled. The only well location with concentrations of PCE exceeding the PRG of 5 µg/L was 03MW03SI (7.3 µg/L).

Concentrations of cis-1,2-DCE ranged from non-detect to 1.8 µg/L (03MW02I), and were detected above the laboratory MDL in 2 of 13 wells sampled. Concentrations of cis-1,2-DCE did not exceed the PRG of 70 µg/L in any of the 13 well locations sampled during the September 2019 groundwater sampling event.

Concentrations of 1,1-DCE ranged from non-detect to 0.72 J µg/L (03MW07S), and were detected above the laboratory MDL in 1 of 13 wells sampled. Concentrations of 1,1-DCE did not exceed the PRG of 7 µg/L in any of the 13 well locations sampled during the September 2019 groundwater sampling event.

Concentrations of TCE, trans-1,2-DCE, VC were not detected above the laboratory MDL in any of the 13 well locations sampled during the September 2019 groundwater sampling event.

Concentration trend charts for primary COC PCE were developed for wells included in the SAP and sampled during September 2019, and are included as Appendix F. PCE concentrations in the Site 3 groundwater appear to be decreasing or stable with time. The consistency and the magnitude of the decreases in PCE concentrations among the most highly contaminated monitoring wells make it unlikely that the decreases are attributable to fluctuations in the data, and suggest that the original source (or sources) of the contamination has been depleted to the extent that it is no longer significantly contributing PCE to the contaminant plume (Tetra Tech, 2019b).

5.3 VOCs and Total Metals Analytical Results Compared to PALs

As shown in Appendix E, PALs have been established for all sampled analytes as outlined in the SAP (Tetra Tech, 2019a), with the exception of one VOC (methyl cyclohexane) and two total metals (calcium and potassium). This section discusses the results from the September 2019 sampling event in comparison to the PALs established by the SAP (Table 5-3) for all analytes except the six COCs with PRGs noted above (Table 5-1), and the radionuclides (radionuclide results are discussed in Section 5.4). Groundwater concentrations of analytes in exceedance of PALs are shown on Figure 5-2.

5.3.1 Volatile Organic Compounds

Concentrations of two VOCs (1,1,1,2-tetrachloroethane [1,1,1,2-PCA] and chloroform [CF]) were detected at concentrations exceeding their applicable PALs.

The only detection of 1,1,1,2-PCA above the laboratory MDL was at well 03MW02I, and that was at a concentration exceeding the PAL of 0.076 of µg/L (0.98 J µg/L).

The only detection of CF above the laboratory MDL was at well 03MW02I, and that was at a concentration exceeding the PAL of 0.22 of µg/L (3 µg/L).

5.3.2 Total Metals

Concentrations of five total metals (arsenic, barium, iron, manganese and sodium) were detected at concentrations exceeding their applicable PALs.

Concentrations of arsenic ranged from non-detected to 2.1 J µg/L (03MW03I), and were detected above the laboratory MDL in 3 of 13 wells sampled, all of which were at concentrations that exceeded the PAL of 0.052 µg/L: 03MW02I (1.5 J µg/L); 03MW03I (2.1 J µg/L); and 03MW03S (1 J µg/L).

Concentrations of barium ranged from 36 µg/L (03MW06S) to 1,300 µg/L (03MW07S), and were detected above the laboratory MDL in each of the 13 wells sampled. Concentrations of barium exceeded the PAL of 380 µg/L at two well locations: 03MW04I (430 µg/L); and 03MW07S (1,300 µg/L).

Concentrations of iron ranged from non-detected to 560 µg/L (03MW04S), and were detected above the laboratory MDL in 7 of 13 wells sampled. Concentrations of iron exceeded the PAL of 300 µg/L at three well locations: 03MW02I (500 µg/L); 03MW03S (440 µg/L); and 03MW04S (560 µg/L).

Concentrations of manganese ranged from non-detected to 170 µg/L (03MW04S), and were detected above the laboratory MDL in 7 of 13 wells sampled. Concentrations of manganese exceeded the PAL of 43 µg/L at two well locations: 03MW02I (57 µg/L); and 03MW04S (170 µg/L).

Concentrations of sodium ranged from 7,600 µg/L (03MW02S) to 46,300 µg/L (03MW07S) and were detected above the laboratory MDL in each of the 13 wells sampled. Concentrations of sodium exceeded the PAL of 20,000 µg/L at one well location: 03MW07S (46,300 µg/L).

The Site 3 HHRA concluded that arsenic is the only total metal that is a significant contributor of risk to Site 3 groundwater; however, the RI concluded that the arsenic detected in Site 3 groundwater is naturally occurring and therefore not related to waste disposal (Tetra Tech, 2011).

5.4 Radionuclide Analytical Results Compared to PALs

The PALs for radionuclides were derived from the USEPA Preliminary Remediation Goal Calculator for Radionuclides and were calculated based on a 10^{-6} Target Risk Range. All PAL values were significantly less than the laboratory Minimum Detectable Concentration (MDC) as defined in the SAP. A comparison of these values is provided in Table 5-6.

Table 5-6: PAL and MDC Values for Radionuclides

Analyte	PAL (pCi/L)	MDC (pCi/L)
Radium-226	0.0004	1.0
Strontium-90	0.065	1.0
Uranium-238	0.00039	0.2

pCi/L – Picocuries per liter.

As summarized in Table 5-3, groundwater concentrations in three samples collected in September 2019 exceeded the PAL for both Ra-226 and U-238. Groundwater concentrations in seven samples collected in September 2019 exceeded the PAL for U-238 only. Sr-90 was not detected above the laboratory MDL in any of the samples collected in September 2019.

An alternate sample evaluation was performed comparing the sample results to the concentration limits listed in the Safe Drinking Water Act (SDWA) Radionuclide Rules (USEPA, 2000). The SDWA Maximum Contaminant Levels (MCLs) for Ra-226/228, Sr-90 (as a beta particle and photo emitter) and uranium are listed in Table 5-7.

Table 5-7: Safe Drinking Water Act MCLs

Analyte	MCL (pCi/L)[1]
Radium-226/228	5.0
Strontium-90 (as a beta particle and photo emitter)	4 millirem/year
Uranium	30 µg/L

[1] – Unless otherwise noted.

The SDWA MCL for beta emitters is 4 millirem/year (mrem/yr). A table is provided on the USEPA website that provides concentrations in picocuries per liter (pCi/L) for beta emitters that equate to a dose of 4 mrem/yr and is included as Appendix G. The value listed in Appendix G for Sr-90 is 8 pCi/L.

The SDWA MCL of 30 µg/L for uranium is in mass units. The USEPA Directive on the use of uranium Drinking Water Standards (USEPA, 2001) is included as Appendix H, and provides the mass to activity conversion of uranium stating that the MCL of 30 µg/L is equivalent to 27 pCi/L.

The converted SDWA MCL values and the maximum detected groundwater concentrations for each analyte during the September 2019 sampling event are listed in Table 5-8.

Table 5-8: Converted Safe Drinking Water Act MCLs

Analyte	MCL (pCi/L)	Maximum Detected Concentration (pCi/L)
Radium-226/228	5.0	1.61 (03MW03SI)
Strontium-90	8.0	Not Detected
Uranium-238	27.0	0.94 (03MW07S)

As summarized in Table 5-3, a majority of the radionuclide groundwater analytical results (including all concentrations of Sr-90) were reported as non-detect values. None of the detected radionuclide groundwater concentrations of Ra-226 or U-238 exceed the converted SDWA MCLs of 5.0 pCi/L and 27 pCi/L, respectively.

September 2019 results indicate that radionuclides concentrations do not exceed and are significantly below the MCLs contained in the SDWA. Additionally, background concentrations are not known. Therefore, sample results may overestimate the contaminant concentrations that are attributable to site activities.

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6.0 Conclusions

September 2019 groundwater VOCs results indicate that groundwater within Site 3 contains PCE above its associated PRG at one well location (03MW03SI). Overall, concentration trends at 03MW03SI indicate that PCE concentrations are decreasing or stable over time and are naturally attenuating. An evaluation of risk in the HHRA concluded that, although concentrations of PCE exceeded the MCL for PCE one well location (03MW03SI), there was no unacceptable risk for PCE in groundwater at Site 3, and therefore PCE was not considered a COC. Remediation of groundwater is not required because there is no discernible plume to treat. The results of the September 2019 groundwater sampling event continue to support these conclusions.

September 2019 groundwater total metals results indicate that arsenic, although present at the site and identified as a COC in the HHRA, is naturally occurring and therefore not related to waste disposal activities in Site 3.

September 2019 groundwater radionuclides results indicate that radionuclides concentrations do not exceed and are significantly below the MCLs contained in the SDWA. Additionally, background concentrations are not known. Therefore, sample results may overestimate the contaminant concentrations that are attributable to site activities.

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7.0 References

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TABLES

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Table 3-1: Site 3 Well Construction and September 2019 Gauging Information

Well ID	Aquifer	Well Diameter (in)	Screened/Open Interval (ft bgs)		Gauging Date	TOC Elevation (ft amsl)	Depth to Water (ft bTOC)	Groundwater Elevation (ft amsl)
			Top	Bottom				
03MW02S	Unconfined	4	4.5	22.5	9/16/2019	326.12	11.57	314.55
03MW02SI	Confined	2	55	65	9/16/2019	326.33	12.87	313.46
03MW02I	Confined	2	134	144	9/16/2019	326.38	6.00	320.38
03MW03S	Unconfined	4	5	20	9/16/2019	313.15	5.53	307.62
03MW03SI	Confined	2	60	80	9/16/2019	314.23	-3.87	318.10
03MW03I	Confined	4	148.5	168.5	9/16/2019	314.99	-4.35	319.34
03MW04S	Unconfined	4	5	35	9/16/2019	324.95	13.73	311.22
03MW04SI	Confined	2	60	80	9/16/2019	324.08	4.30	319.78
03MW04I	Confined	4	148	168	9/16/2019	323.54	-5.10*	328.64*
03MW06S	Unconfined	2	26	36	9/16/2019	367.00	34.69	332.31
03MW06SI	Unconfined	2	75	85	9/16/2019	366.86	31.06	335.80
03MW07S	Unconfined	2	34	44	9/16/2019	324.90	12.70	312.20
03MW090	Unconfined	2	5	10	9/16/2019	319.22	DRY	--
03MW09S	Unconfined	4	18	33	9/16/2019	318.24	11.26	306.98

Notes:

Negative depth to water values indicate artesian flow conditions.

Static water levels in the flowing artesian wells were obtained by extending the riser of the wells and measuring the height of the water above the reference point.

in = Inches.

ft bgs = Feet below ground surface.

ft amsl = Feet above mean sea level (NAVD 88).

ft bTOC = Feet below top of inner casing.

NAVD 88 = North American Vertical Datum of 1988.

* = Measurement is approximate.

-- = Not calculated.

Table 3-2: Site 3 Groundwater Quality Parameters - September 2019

Well ID	Sample Date	pH (s.u.)	Specific Conductance (mS/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)
03MW02S	9/17/2019	5.41	0.103	18.66	1.04	3.20	405
03MW02SI	9/17/2019	6.84	0.203	15.53	0.25	4.63	250
03MW02I	9/17/2019	5.38	0.234	16.81	3.28	5.69	92
03MW03S	9/16/2019	4.14	0.201	17.52	1.31	0.53	250
03MW03SI	9/20/2019	6.72	0.199	11.98	0.21	6.08	379
03MW03I	9/20/2019	8.17	0.272	12.91	0.30	5.97	237
03MW04S	9/18/2019	6.35	0.305	13.06	3.71	6.44	223
03MW04SI	9/18/2019	6.22	0.295	13.54	0.13	6.89	244
03MW04I	9/20/2019	6.86	0.320	12.30	0.51	5.25	335
03MW06S	9/17/2019	5.35	0.150	17.89	0.87	8.50	461
03MW06SI	9/17/2019	3.22	0.156	17.79	0.87	2.17	319
03MW07S	9/18/2019	6.86	1.090	15.28	2.39	4.33	217
03MW09O	--	Dry - Not Sampled					
03MW09S	9/18/2019	6.24	0.221	13.95	4.47	4.10	93

Notes:

s.u. = Standard pH units.

mS/cm = MilliSiemens per centimeter.

°C = Degrees Celsius.

mg/L = Milligrams per liter.

ORP = Oxidation-reduction potential.

mV = Millivolts.

NTU = Nephelometric Turbidity Units.

Table 5-2: Site 3 September 2019 Groundwater Results Compared to Proposed Remediation Goals

				Location	03MW02I	03MW02S	03MW02SI	03MW03I	03MW03S	03MW03SI		03MW04I	03MW04S
				Sample ID	03MW02I-20190917	03MW02S-20190917	03MW02SI-20190917	03MW03I-20190920	03MW03S-20190916	03MW03SI-20190920	03MW03SI-20190920-D	03MW04I-20190920	03MW04S-20190918
				Sample Date	9/17/2019	9/17/2019	9/17/2019	9/20/2019	9/16/2019	9/20/2019	9/20/2019	9/20/2019	9/18/2019
				Sample Code	N	N	N	N	N	N	FD	N	N
Analyte	**CASRN**	**PRG**	**Units**										
Volatile Organic Compounds													
1,1-Dichloroethene	75-35-4	7	µg/L		0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ
Cis-1,2-Dichloroethene	156-59-2	70	µg/L		**1.8**	0.75 U	0.75 U	**0.52 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene	127-18-4	5	µg/L		0.75 U	**1.2 J+**	0.75 U	**1.4**	**3.1**	**7.2**	**7.3**	0.75 U	**2.8**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L		0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ
Trichloroethene	79-01-6	5	µg/L		0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride	75-01-4	2	µg/L		0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U

Data Qualifiers:
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.

Table 5-2: Site 3 September 2019 Groundwater Results Compared to Proposed Remediation Goals

				Location	03MW04SI		03MW06S	03MW06SI	03MW07S	03MW09S
				Sample ID	03MW04SI-20190918	03MW04SI-20190918-D	03MW06S-20190917	03MW06SI-20190917	03MW07S-20190918	03MW09IS-20190918
				Sample Date	9/18/2019	9/18/2019	9/17/2019	9/17/2019	9/18/2019	9/18/2019
				Sample Code	N	FD	N	N	N	N
Analyte	**CASRN**	**PRG**	**Units**							
Volatile Organic Compounds										
1,1-Dichloroethene	75-35-4	7	µg/L		0.75 UJ	0.75 U	0.75 U	0.75 U	**0.72 J**	0.75 UJ
Cis-1,2-Dichloroethene	156-59-2	70	µg/L		0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene	127-18-4	5	µg/L		**3.7**	**3.4 J+**	**0.47 J**	0.75 U	**0.65 J**	**3.8**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L		0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 UJ
Trichloroethene	79-01-6	5	µg/L		0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride	75-01-4	2	µg/L		0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U

Data Qualifiers:
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.

Table 5-3: Site 3 September 2019 Groundwater Results Compared to Project Action Limits

					Location	03MW02I	03MW02S	03MW02SI	03MW03I	03MW03S	03MW03SI		03MW04I	03MW04S
					Sample ID	03MW02I-20190917	03MW02S-20190917	03MW02SI-20190917	03MW03I-20190920	03MW03S-20190916	03MW03SI-20190920	03MW03SI-20190920-D	03MW04I-20190920	03MW04S-20190918
					Sample Date	9/17/2019	9/17/2019	9/17/2019	9/20/2019	9/16/2019	9/20/2019	9/20/2019	9/20/2019	9/18/2019
					Sample Code	N	N	N	N	N	N	FD	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**										
Volatile Organic Compounds														
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	**0.98 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	**0.33 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ	0.75 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	62.5 U	62.5 U	62.5 U	62.5 UJ	62.5 U	62.5 UJ	62.5 UJ	62.5 UJ	62.5 UJ	62.5 UJ
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	3.8 U	3.8 U	3.8 U	3.8 UJ	3.8 U	3.8 UJ	3.8 UJ	3.8 UJ	3.8 UJ	3.8 UJ
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	**7.8**	**3.5 J**	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	**3.5 J**
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	**3**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	**1.8**	0.75 U	0.75 U	**0.52 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ
Methyl Cyclohexane	108-87-2	--	--	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Methylene Chloride	75-09-2	5	MCL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Styrene	100-42-5	100	MCL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	0.75 U	**1.2 J+**	0.75 U	**1.4**	**3.1**	**7.2**	**7.3**	0.75 U	**2.8**	
Toluene	108-88-3	110	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ	0.75 UJ
Trans-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U

Table 5-3: Site 3 September 2019 Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW02I	03MW02S	03MW02SI	03MW03I	03MW03S	03MW03SI		03MW04I	03MW04S
					Sample ID	03MW02I-20190917	03MW02S-20190917	03MW02SI-20190917	03MW03I-20190920	03MW03S-20190916	03MW03SI-20190920	03MW03SI-20190920-D	03MW04I-20190920	03MW04S-20190918
					Sample Date	9/17/2019	9/17/2019	9/17/2019	9/20/2019	9/16/2019	9/20/2019	9/20/2019	9/20/2019	9/18/2019
					Sample Code	N	N	N	N	N	N	FD	N	N
Metals (Total)														
Aluminum[3]	7429-90-5	200	MCL	µg/L		**140**	59 U	59 U	59 U	59 U	59 U	59 U	59 U	**190**
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L		1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L		**1.5 J**	2 U	2 U	**2.1 J**	**1 J**	2 U	2 U	2 U	2 U
Barium	7440-39-3	380	Tap Water RSL	µg/L		**320**	**100**	**320**	**250**	**160**	**300**	**300**	**430**	**380**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L		0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L		0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Calcium	7440-70-2	--	--	µg/L		**22200**	**8500**	**24900**	**28000**	**18800**	**22500**	**22200**	**35500**	**30600**
Chromium	7440-47-3	100	MCL	µg/L		**6.6**	**2.9**	**2.2**	**0.79 J**	**1 J**	1.5 U	1.5 U	1.5 U	**2.9**
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L		3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Copper	7440-50-8	80	Tap Water RSL	µg/L		**23**	2.8 U	3.7 U	3.7 U	3.7 U	3.9 U	3.7 U	4.6 U	2.4 U
Iron[3]	7439-89-6	300	MCL	µg/L		**500**	37 U	37 U	37 U	**440**	37 U	37 U	37 U	**560**
Lead	7439-92-1	15	MCL	µg/L		**1.8 J**	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Magnesium	7439-95-4	NC	None	µg/L		**10500**	**3900**	**12800**	**15500**	**7100**	**9200**	**9100**	**10900**	**12000**
Manganese	7439-96-5	43	Tap Water RSL	µg/L		**57**	3.7 U	3.7 U	3.7 U	**27**	3.7 U	3.7 U	3.7 U	**170**
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L		0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L		**5 J**	**2.5 J**	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	**2.4 J**
Potassium	7440-09-7	--	--	µg/L		**810**	**1100**	**770**	**1400**	**1000**	**590**	**580**	**810**	**720**
Selenium	7782-49-2	10	Tap Water RSL	µg/L		3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	**1.9 J**	3.7 U
Silver	7440-22-4	9.4	Tap Water RSL	µg/L		1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Sodium	7440-23-5	20000	Health Advisory	µg/L		**8100**	**7600**	**11500**	**8400**	**8900**	**9100**	**8800**	**15600**	**13900**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L		0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.4 U	0.7 U	0.7 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L		**2.4**	1.5 U	**2 J**	**1.9 J**	**1.3 J**	**1.8 J**	**1.8 J**	1.5 U	**1.4 J**
Zinc	7440-66-6	600	Tap Water RSL	µg/L		**47**	4.5 U	2.3 U	3.2 U	4.3 U	5 U	3.1 U	5.6 U	**6.1**
Radionuclides														
Radium-226	13982-63-3	0.0004	--	pCi/L		0.19 U	**0.49**	**0.61**	0.16 U	0.31 U	0.13 U	**1.61**	0.04 U	0.11 U
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L		0.15 U	0.12 U	0.39 U	-0.21 U	0.35 U	-0.16 U	-0.27 U	0.08 U	0.38 U
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L		**0.2**	**0.199**	**0.166**	0.1 U	**0.101**	0.066 U	**0.119**	**0.128**	**0.167**

Data Qualifiers:

J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.

Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-3: Site 3 September 2019 Groundwater Results Compared to Project Action Limits

					Location	03MW04SI		03MW06S	03MW06SI	03MW07S	03MW09S
					Sample ID	03MW04SI-20190918	03MW04SI-20190918-D	03MW06S-20190917	03MW06SI-20190917	03MW07S-20190918	03MW09IS-20190918
					Sample Date	9/18/2019	9/18/2019	9/17/2019	9/17/2019	9/18/2019	9/18/2019
					Sample Code	N	FD	N	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**							
Volatile Organic Compounds											
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	**0.42 J**	0.75 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	**0.53 J**	0.75 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	0.75 UJ	0.75 U		0.75 U	0.75 U	**0.72 J**	0.75 UJ
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 UJ	0.75 U	0.75 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	2.5 U	2.5 U		2.5 U	2.5 U	2.5 U	2.5 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	62.5 UJ	62.5 UJ		62.5 U	62.5 UJ	62.5 UJ	62.5 UJ
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	3.8 UJ	3.8 U		3.8 U	3.8 U	3.8 UJ	3.8 UJ
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	3.8 U	3.8 U		3.8 U	3.8 U	3.8 U	3.8 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	3.8 U	3.8 U		3.8 U	3.8 U	3.8 U	3.8 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	**5.6**	**5.3 J**		3.8 U	3.8 U	3.8 U	3.8 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	0.75 UJ	0.75 UJ		0.75 U	0.75 U	0.75 UJ	0.75 UJ
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	0.75 UJ	0.75 U		0.75 U	0.75 U	0.75 UJ	0.75 UJ
Methyl Cyclohexane	108-87-2	--	--	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Methylene Chloride	75-09-2	5	MCL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Styrene	100-42-5	100	MCL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**3.7**	**3.4 J+**		**0.47 J**	0.75 U	**0.65 J**	**3.8**
Toluene	108-88-3	110	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	2.3 U	2.3 U		2.3 U	2.3 U	2.3 U	2.3 U
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	0.75 UJ	0.75 U		0.75 U	0.75 U	0.75 UJ	0.75 UJ
Trans-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	0.75 U	0.75 U		0.75 U	0.75 U	0.75 U	0.75 U

Table 5-3: Site 3 September 2019 Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW04SI	03MW04SI	03MW06S	03MW06SI	03MW07S	03MW09S
					Sample ID	03MW04SI-20190918	03MW04SI-20190918-D	03MW06S-20190917	03MW06SI-20190917	03MW07S-20190918	03MW09IS-20190918
					Sample Date	9/18/2019	9/18/2019	9/17/2019	9/17/2019	9/18/2019	9/18/2019
					Sample Code	N	FD	N	N	N	N
Metals (Total)											
Aluminum[3]	7429-90-5	200	MCL	µg/L		59 U	59 U	**47 J**	59 U	**160**	**200**
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L		1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L		2 U	2 U	2 U	2 U	2 U	2 U
Barium	7440-39-3	380	Tap Water RSL	µg/L		**300**	**300**	**36**	**110**	**1300**	**200**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L		0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L		0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Calcium	7440-70-2	--	--	µg/L		**32400**	**30300**	**10400**	**10700**	**123000**	**24000**
Chromium	7440-47-3	100	MCL	µg/L		**2.8**	**4.5**	**4**	**4.7**	**2.4**	**5.3**
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L		3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Copper	7440-50-8	80	Tap Water RSL	µg/L		3.7 U	**12**	4.5 U	2.2 U	2.7 U	**26**
Iron[3]	7439-89-6	300	MCL	µg/L		37 U	37 U	**78**	**40 J**	**97**	**200**
Lead	7439-92-1	15	MCL	µg/L		1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Magnesium	7439-95-4	NC	None	µg/L		**8400**	**9400**	**5600**	**3700**	**37000**	**7600**
Manganese	7439-96-5	43	Tap Water RSL	µg/L		3.7 U	3.7 U	**5.8**	**3.9 J**	**13**	**12**
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L		0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L		3.7 U	**2.3 J**	**4.2 J**	**4.9 J**	**3.9 J**	**3.8 J**
Potassium	7440-09-7	--	--	µg/L		**710**	**860**	**1400**	**1100**	**1300**	**880**
Selenium	7782-49-2	10	Tap Water RSL	µg/L		**2.2 J**	3.7 U	**4.1 J**	3.7 U	3.7 U	**2 J**
Silver	7440-22-4	9.4	Tap Water RSL	µg/L		1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Sodium	7440-23-5	20000	Health Advisory	µg/L		**15800**	**17500**	**10900**	**11200**	**46300**	**11500**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L		0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L		1.5 U	1.5 U	1.5 U	1.5 U	**0.95 J**	**0.93 J**
Zinc	7440-66-6	600	Tap Water RSL	µg/L		3 U	**7.3**	**6.2**	3.8 U	3.1 U	4.5 U
Radionuclides											
Radium-226	13982-63-3	0.0004	--	pCi/L		0.12 U	0.04 U	-0.04 U	-0.04 U	0.26 U	0.21 U
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L		0.23 U	0.03 U	0.08 U	-0.18 U	0 U	0.05 U
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L		**0.082**	0.044 U	0.05 U	0.03 U	**0.94**	**0.134**

Data Qualifiers:

J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.

Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

				Location	03MW02I	03MW02I	03MW02I	03MW02I		03MW02I	03MW02I	03MW02S
				Sample ID	03MW02I_19970707	03MW02I-20080318	03MW02I-20081020	03MW02I-L-20081020	03MW02I-L-20081020-D	03MW02I-20170519	03MW02I-20190917	03MW02S_19910918
				Sample Date	7/7/1997	3/18/2008	10/20/2008	10/20/2008	10/20/2008	5/19/2017	9/17/2019	9/18/1991
				Sample Code	N	N	N	N	FD	N	N	N
Analyte	**CASRN**	**PRG**	**Units**									
Volatile Organic Compounds												
1,1-Dichloroethene	75-35-4	7	µg/L		10 U	1 U	1 U	1 U	1 U	0.8 U	0.75 U	5 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L		--	1 U	1 U	1 U	1 U	0.4 U	**1.8**	--
Tetrachloroethene	127-18-4	5	µg/L		**8 J**	**7.8**	**9.1**	**7.3**	**7.6**	**4.7**	0.75 U	5 U
Trans-1,2-Dichloroethene	156-60-5	100	µg/L		--	1 U	1 U	1 U	1 U	0.4 U	0.75 U	--
Trichloroethene	79-01-6	5	µg/L		10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Vinyl Chloride	75-01-4	2	µg/L		10 U	1 U	1 U	1 U	1 U	0.2 U	0.75 U	10 U

Data Qualifiers:

J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW02S	03MW02S	03MW02S	03MW02S	03MW02S	03MW02SI	03MW02SI	03MW02SI
			Sample ID	03MW02S_19970626	03MW02S-20080318	03MW02S-20081016	03MW02S-20170519	03MW02S-20190917	03MW02SI_19970707	03MW02SI-20080318	03MW02SI-20081017
			Sample Date	6/26/1997	3/18/2008	10/16/2008	5/19/2017	9/17/2019	7/7/1997	3/18/2008	10/17/2008
			Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	10 U	1 U	1 U	0.8 U	0.75 U	10 U	1 U	1 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
Tetrachloroethene	127-18-4	5	µg/L	10 U	1 U	1 U	0.4 U	**1.2 J+**	**6 J**	**3.3**	**3.3**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
Trichloroethene	79-01-6	5	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Vinyl Chloride	75-01-4	2	µg/L	10 U	1 U	1 U	0.2 U	0.75 U	10 U	1 U	1 U

Data Qualifiers:

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J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW02SI	03MW02SI	03MW03I		03MW03I		03MW03I	03MW03I
			Sample ID	03MW02SI-20170519	03MW02SI-20190917	03MW03I_19910923	03MW03I_19910923-D	03MW03I_19970630	03MW03I_19970630-D	03MW03I-20080317	03MW03I-20081021
			Sample Date	5/19/2017	9/17/2019	9/23/1991	9/23/1991	6/30/1997	6/30/1997	3/17/2008	10/21/2008
			Sample Code	N	N	N	FD	N	FD	N	N
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	0.8 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
Tetrachloroethene	127-18-4	5	µg/L	**1**	0.75 U	**5**	**5**	**6 J**	**6 J**	**6.9**	**10.4**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
Trichloroethene	79-01-6	5	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Vinyl Chloride	75-01-4	2	µg/L	0.2 U	0.75 U	10 U	10 U	10 U	10 U	1 U	1 U

Data Qualifiers:

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J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:

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Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW03I	03MW03I	03MW03I	03MW03S	03MW03S	03MW03S	03MW03S	03MW03S
			Sample ID	03MW03I-200904011	03MW03I-20170522	03MW03I-20190920	03MW03S_19910918	03MW03S_19970625	03MW03S-20080317	03MW03S-20081020	03MW03S-L-20081020
			Sample Date	4/1/2009	5/22/2017	9/20/2019	9/18/1991	6/25/1997	3/17/2008	10/20/2008	10/20/2008
			Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	1 U	0.8 U	0.75 UJ	5 U	10 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	1 U	0.4 U	**0.52 J**	--	--	1 U	1 U	1 U
Tetrachloroethene	127-18-4	5	µg/L	**4.3**	**2.1**	**1.4**	**8**	**5 J**	**2.5**	**2.6**	**2.1**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	1 U	0.4 U	0.75 UJ	--	--	1 U	1 U	1 U
Trichloroethene	79-01-6	5	µg/L	1 U	0.48 J	0.75 U	5 U	10 U	1 U	1 U	1 U
Vinyl Chloride	75-01-4	2	µg/L	1 U	0.2 U	0.75 U	10 U	10 U	1 U	1 U	1 U

Data Qualifiers:

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Notes:

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MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW03S		03MW03S		03MW03S	03MW03SI	03MW03SI	03MW03SI
			Sample ID	03MW03S-20090401	03MW03S-20090401-D	03MW03S-20170522	03MW03S-20170522-D	03MW03S-20190916	03MW03SI_19910920	03MW03SI_19970625	03MW03SI-20080317
			Sample Date	4/1/2009	4/1/2009	5/22/2017	5/22/2017	9/16/2019	9/20/1991	6/25/1997	3/17/2008
			Sample Code	N	FD	N	FD	N	N	N	N
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	5 U	10 U	1 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
Tetrachloroethene	127-18-4	5	µg/L	**3**	**3.2**	**3.1**	**2.6**	**3.1**	**35**	**18**	**12**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
Trichloroethene	79-01-6	5	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Vinyl Chloride	75-01-4	2	µg/L	1 U	1 U	0.2 U	0.2 U	0.75 U	10 U	10 U	1 U

Data Qualifiers:

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Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

				Location	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW04I	03MW04I
				Sample ID	03MW03SI-20080317-D	03MW03SI-20081021	03MW03SI-20090401	03MW03SI-20170519	03MW03SI-20190920	03MW03SI-20190920-D	03MW04I_19910920	03MW04I_19970630
				Sample Date	3/17/2008	10/21/2008	4/1/2009	5/19/2017	9/20/2019	9/20/2019	9/20/1991	6/30/1997
				Sample Code	FD	N	N	N	N	FD	N	N
Analyte	**CASRN**	**PRG**	**Units**									
Volatile Organic Compounds												
1,1-Dichloroethene	75-35-4	7	µg/L		1 U	1 U	1 U	0.8 U	0.75 UJ	0.75 UJ	5 U	10 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	--
Tetrachloroethene	127-18-4	5	µg/L		**11.7**	**12.4**	**10.8**	**5.2**	**7.2**	**7.3**	5 U	10 U
Trans-1,2-Dichloroethene	156-60-5	100	µg/L		1 U	1 U	1 U	0.4 U	0.75 UJ	0.75 UJ	--	--
Trichloroethene	79-01-6	5	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Vinyl Chloride	75-01-4	2	µg/L		1 U	1 U	1 U	0.2 U	0.75 U	0.75 U	10 U	10 U

Data Qualifiers:

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J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW04I	03MW04I	03MW04I	03MW04I	03MW04I	03MW04S	03MW04S	03MW04S
			Sample ID	03MW04I-20080314	03MW04I-20081014	03MW04I-20090402	03MW04I-20170519	03MW04I-20190920	03MW04S_19910918	03MW04S_19970625	03MW04S-20080314
			Sample Date	3/14/2008	10/14/2018	4/2/2009	5/19/2017	9/20/2019	9/18/1991	6/25/1997	3/14/2008
			Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	1 U	1 U	1 U	0.8 U	0.75 UJ	5 U	10 U	1 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	--	--	1 U
Tetrachloroethene	127-18-4	5	µg/L	**0.45 J**	1 U	**0.41 J**	**0.22 J**	0.75 U	**61**	**21**	**4.5**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	1 U	1 U	1 U	0.4 U	0.75 UJ	--	--	1 U
Trichloroethene	79-01-6	5	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Vinyl Chloride	75-01-4	2	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	10 U	10 U	1 U

Data Qualifiers:

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UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:

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Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW04S	03MW04S	03MW04S	03MW04S	03MW04SI	03MW04SI		03MW04SI
			Sample ID	03MW04S-20081016	03MW04S-20090402	03MW04S-20170519	03MW04S-20190918	03MW04SI_19910920	03MW04SI_19970625	03MW04SI_19970625-D	03MW04SI-20080314
			Sample Date	10/16/2008	4/2/2009	5/19/2017	9/18/2019	9/20/1991	6/25/1997	6/25/1997	3/14/2008
			Sample Code	N	N	N	N	N	N	FD	N
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	1 U	1 U	0.8 U	0.75 UJ	5 U	10 U	10 U	1 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	1 U	1 U	0.4 U	0.75 U	--	--	--	1 U
Tetrachloroethene	127-18-4	5	µg/L	**2.7**	**3.1**	**3.2**	**2.8**	**56**	**20**	**22**	**4.6**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	1 U	1 U	0.4 U	0.75 UJ	--	--	--	1 U
Trichloroethene	79-01-6	5	µg/L	1 U	1 U	**0.17 J**	0.75 U	5 U	10 U	10 U	1 U
Vinyl Chloride	75-01-4	2	µg/L	1 U	1 U	0.2 U	0.75 U	10 U	10 U	10 U	1 U

Data Qualifiers:

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Notes:

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Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW04SI	03MW04SI	03MW04SI	03MW04SI	03MW04SI		03MW06S	03MW06S
			Sample ID	03MW04SI-20081014	03MW04SI-L-20081014	03MW04SI-20090402	03MW04SI-20170519	03MW04SI-20190918	03MW04SI-20190918-D	03MW06S_19970630	03MW06S-20080313
			Sample Date	10/14/2008	10/14/2008	4/2/2009	5/19/2017	9/18/2019	9/18/2019	6/30/1997	3/13/2008
			Sample Code	N	N	N	N	N	FD	N	N
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	1 U	1 U	1 U	0.8 U	0.75 UJ	0.75 U	10 U	1 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	1 U
Tetrachloroethene	127-18-4	5	µg/L	**3.9**	**4**	**5.7**	**3.2**	**3.7**	**3.4 J+**	**29**	**0.76 J**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	1 U	1 U	1 U	0.4 U	0.75 UJ	0.75 U	--	1 U
Trichloroethene	79-01-6	5	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Vinyl Chloride	75-01-4	2	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	0.75 U	10 U	1 U

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Notes:

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MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW06S	03MW06S	03MW06S	03MW06SI	03MW06SI	03MW06SI	03MW06SI	03MW07S
			Sample ID	03MW06S-20081015	03MW06S-20170522	03MW06S-20190917	03MW06SI_19970618	03MW06SI-20080313	03MW06SI-20081015	03MW06SI-20190917	03MW07S_19970707
			Sample Date	10/15/2008	5/22/2017	9/17/2019	6/18/1997	3/13/2008	10/15/2008	9/17/2019	7/7/1997
			Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	1 U	0.8 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
Tetrachloroethene	127-18-4	5	µg/L	**1.8**	**0.44 J**	**0.47 J**	10 U	1 U	1 U	0.75 U	10 U
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
Trichloroethene	79-01-6	5	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Vinyl Chloride	75-01-4	2	µg/L	1 U	0.2 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U

Data Qualifiers:

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U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

			Location	03MW07S	03MW07S	03MW07S	03MW07S	03MW07S	03MW09O	03MW09O	
			Sample ID	03MW07S-20080319	03MW07S-20081021	03MW07S-20090402	03MW07S-20170522	03MW07S-20190918	03MW09O-20100217	03MW09I-20170522	03MW09I-20170522-D
			Sample Date	3/19/2008	10/21/2008	4/2/2009	5/22/2017	9/18/2019	2/17/2010	5/22/2017	5/22/2017
			Sample Code	N	N	N	N	N	N	N	FD
Analyte	**CASRN**	**PRG**	**Units**								
Volatile Organic Compounds											
1,1-Dichloroethene	75-35-4	7	µg/L	1 U	1 U	1 U	0.8 U	**0.72 J**	0.5 U	0.8 U	0.8 U
Cis-1,2-Dichloroethene	156-59-2	70	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Tetrachloroethene	127-18-4	5	µg/L	**1.1**	**0.41 J**	**0.74 J**	**0.68 J**	**0.65 J**	**0.35 J**	**2.9**	**2.9**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L	1 U	1 U	1 U	0.4 U	0.75 UJ	0.5 U	0.4 U	0.4 U
Trichloroethene	79-01-6	5	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Vinyl Chloride	75-01-4	2	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	0.5 U	0.2 U	0.2 U

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U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-4: Site 3 Historical Groundwater Results Compared to Proposed Remediation Goals

				Location	03MW09S	03MW09S	03MW09S
				Sample ID	03MW09S-20100217	03MW09S-20170522	03MW09IS-20190918
				Sample Date	2/17/2010	5/22/2017	9/18/2019
				Sample Code	N	N	N
Analyte	**CASRN**	**PRG**	**Units**				
Volatile Organic Compounds							
1,1-Dichloroethene	75-35-4	7	µg/L		0.5 U	0.8 U	0.75 UJ
Cis-1,2-Dichloroethene	156-59-2	70	µg/L		0.5 U	0.4 U	0.75 U
Tetrachloroethene	127-18-4	5	µg/L		**6.8**	**0.45 J**	**3.8**
Trans-1,2-Dichloroethene	156-60-5	100	µg/L		0.5 U	0.4 U	0.75 UJ
Trichloroethene	79-01-6	5	µg/L		**0.11 J**	0.4 U	0.75 U
Vinyl Chloride	75-01-4	2	µg/L		0.5 U	0.2 U	0.75 U

Data Qualifiers:

J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate

Notes:

Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PRG.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PRG = Proposed Remediation Goal.
µg/L = Micrograms per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

				Location	03MW02I	03MW02I	03MW02I	03MW02I		03MW02I	03MW02I	03MW02S
				Sample ID	03MW02I_19970707	03MW02I-20080318	03MW02I-20081020	03MW02I-L-20081020	03MW02I-L-20081020-D	03MW02I-20170519	03MW02I-20190917	03MW02S_19910918
				Sample Date	7/7/1997	3/18/2008	10/20/2008	10/20/2008	10/20/2008	5/19/2017	9/17/2019	9/18/1991
				Sample Code	N	N	N	N	FD	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**								
Volatile Organic Compounds												
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.8 U	**0.98 J**	5 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.8 U	0.75 U	5 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	1.6 U	**0.33 J**	--
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.8 U	0.75 U	5 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	10 U	1 U	1 U	1 U	1 U	0.8 U	0.75 U	5 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	--	2 U	2 U	2 U	2 U	0.8 U	0.75 U	--
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	--	2 U	2 U	2 U	2 U	0.8 U	0.75 U	--
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	--	7 U	7 U	7 U	7 U	1.6 U	2.5 U	--
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.4 U	0.75 U	--
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.4 U	0.75 U	--
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.4 U	0.75 U	--
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.4 U	0.75 U	--
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	--	--	320 U	320 U	320 U	0.5 U	62.5 U	--
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 U	10 UR	10 UR	10 UR	10 UR	4 U	3.8 U	10 U
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	10 U	5 U	5 U	5 U	5 U	4 U	3.8 U	10 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	10 U	5 U	5 U	5 U	5 U	3.2 U	3.8 U	10 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 U	10 UR	10 U	10 U	10 U	6.4 U	**7.8**	10 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.2 U	0.75 U	--
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.8 U	0.75 U	10 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	1.6 U	0.75 U	5 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	10 U	**0.38 J**	1 U	1 U	1 U	**0.3 J**	0.75 U	5 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	1.6 U	0.75 U	10 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	**3**	5 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.8 U	0.75 U	10 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.4 U	**1.8**	--
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.8 U	0.75 U	--
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.8 U	0.75 U	--
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.4 U	0.75 U	--
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	--	2 U	2 U	2 U	2 U	4 U	0.75 U	--
Methyl Cyclohexane	108-87-2	--	--	µg/L	--	1 U	1 U	1 U	1 U	0.8 U	0.75 U	--
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.8 U	0.75 U	--
Methylene Chloride	75-09-2	5	MCL	µg/L	**21 B**	1 U	1 U	1 U	1 U	0.8 U	0.75 U	5 U
Styrene	100-42-5	100	MCL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**8 J**	**7.8**	**9.1**	**7.3**	**7.6**	**4.7**	0.75 U	5 U
Toluene	108-88-3	110	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	**0.66 J**	0.75 U	5 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	10 U	--	--	--	--	--	2.3 U	5 U
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.4 U	0.75 U	--
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.4 U	0.75 U	5 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	--	1 U	1 U	1 U	1 U	0.8 U	0.75 U	--
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	10 U	1 U	1 U	1 U	1 U	0.2 U	0.75 U	10 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

				Location	03MW02I	03MW02I	03MW02I	03MW02I		03MW02I	03MW02I	03MW02S
				Sample ID	03MW02I_19970707	03MW02I-20080318	03MW02I-20081020	03MW02I-L-20081020	03MW02I-L-20081020-D	03MW02I-20170519	03MW02I-20190917	03MW02S_19910918
				Sample Date	7/7/1997	3/18/2008	10/20/2008	10/20/2008	10/20/2008	5/19/2017	9/17/2019	9/18/1991
				Sample Code	N	N	N	N	FD	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**								
Metals (Total)												
Aluminum[3]	7429-90-5	200	MCL	µg/L	50 U	80 U	--	--	--	--	**140**	**214 B**
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L	20 U	2 U	--	--	--	--	1.5 U	45 U
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L	1 U	**1 J**	--	--	--	--	**1.5 J**	2 U
Barium	7440-39-3	380	Tap Water RSL	µg/L	**226**	**268**	--	--	--	--	**320**	**99**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L	1 U	1 U	--	--	--	--	0.7 U	**3 B**
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L	5 U	1 U	--	--	--	--	0.7 U	4 U
Calcium	7440-70-2	--	--	µg/L	**21600**	**21400**	--	--	--	--	**22200**	**6820**
Chromium	7440-47-3	100	MCL	µg/L	5 U	**2 B**	--	--	--	--	**6.6**	7 U
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L	5 U	6 U	--	--	--	--	3.7 U	10 U
Copper	7440-50-8	80	Tap Water RSL	µg/L	10 U	**0.7 B**	--	--	--	--	**23**	**6 B**
Iron[3]	7439-89-6	300	MCL	µg/L	**228 J**	70 U	--	--	--	--	**500**	**328**
Lead	7439-92-1	15	MCL	µg/L	1 U	2 U	--	--	--	--	**1.8 J**	**1.4**
Magnesium	7439-95-4	--	--	µg/L	**9440**	**9550**	--	--	--	--	**10500**	**2940**
Manganese	7439-96-5	43	Tap Water RSL	µg/L	**14.6**	**1.8 J**	--	--	--	--	**57**	**15**
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L	0.2 U	0.5 U	--	--	--	--	0.33 U	0.2 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L	20 U	**1.4 J**	--	--	--	--	**5 J**	12 U
Potassium	7440-09-7	--	--	µg/L	1500 U	**660**	--	--	--	--	**810**	2140 U
Selenium	7782-49-2	10	Tap Water RSL	µg/L	1 UL	6 U	--	--	--	--	3.7 U	4 U
Silver	7440-22-4	9.4	Tap Water RSL	µg/L	5 U	**0.6 B**	--	--	--	--	1.5 U	6 U
Sodium	7440-23-5	20000	Health Advisory	µg/L	**7240**	**7020**	--	--	--	--	**8100**	**6680**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L	1 U	1 U	--	--	--	--	0.7 U	2 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L	5 U	**1.8**	--	--	--	--	**2.4**	4 U
Zinc	7440-66-6	600	Tap Water RSL	µg/L	5 U	6 U	--	--	--	--	**47**	**8 B**
Radionuclides												
Radium-226	13982-63-3	0.0004	--	pCi/L	--	--	--	--	--	--	0.19 U	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L	--	--	--	--	--	--	0.15 U	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L	--	--	--	--	--	--	**0.2**	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable.
Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

					Location	03MW02S	03MW02S	03MW02S	03MW02S	03MW02S	03MW02SI	03MW02SI	03MW02SI
					Sample ID	03MW02S_19970626	03MW02S-20080318	03MW02S-20081016	03MW02S-20170519	03MW02S-20190917	03MW02SI_19970707	03MW02SI-20080318	03MW02SI-20081017
					Sample Date	6/26/1997	3/18/2008	10/16/2008	5/19/2017	9/17/2019	7/7/1997	3/18/2008	10/17/2008
					Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**									
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	10 U	1 U	1 U	0.8 U	0.75 U	10 U	1 U	1 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	10 U	1 U	1 U	0.8 U	0.75 U	10 U	1 U	1 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	--	1 U	1 U	1.6 U	0.75 U	--	1 U	1 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	10 U	1 U	1 U	0.8 U	0.75 U	10 U	1 U	1 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	10 U	1 U	1 U	0.8 U	0.75 U	10 U	1 U	1 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	--	2 U	2 U	0.8 U	0.75 U	--	2 U	2 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	--	2 U	2 U	0.8 U	0.75 U	--	2 U	2 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	--	7 U	7 U	1.6 U	2.5 U	--	7 U	7 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	--	--	320 U	0.5 U	62.5 U	--	--	320 U
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 U	10 UR	10 UR	4 U	3.8 U	10 U	10 UR	10 UR
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	10 U	5 U	5 U	4 U	3.8 U	10 U	5 U	5 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	10 U	5 U	5 U	3.2 U	3.8 U	10 U	5 U	5 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 U	10 UR	10 U	6.4 U	**3.5 J**	10 U	10 UR	10 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	--	1 U	1 U	0.2 U	0.75 U	--	1 U	1 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	10 U	1 U	1 U	0.8 U	0.75 U	10 U	1 U	1 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	10 U	1 U	1 U	1.6 U	0.75 U	10 U	1 U	1 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	10 U	1 U	1 U	1.6 U	0.75 U	10 U	1 U	1 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	10 U	1 U	1 U	0.8 U	0.75 U	10 U	1 U	1 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	--	1 U	1 U	0.8 U	0.75 U	--	1 U	1 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	--	1 U	1 U	0.8 U	0.75 U	--	1 U	1 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	--	2 U	2 U	4 U	0.75 U	--	2 U	2 U
Methyl Cyclohexane	108-87-2	--	--	µg/L	--	1 U	1 U	0.8 U	0.75 U	--	1 U	1 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	--	1 U	1 U	0.8 U	0.75 U	--	1 U	1 U
Methylene Chloride	75-09-2	5	MCL	µg/L	**12 B**	1 U	1 U	0.8 U	0.75 U	**5 B**	1 U	1 U
Styrene	100-42-5	100	MCL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	10 U	1 U	1 U	0.4 U	**1.2 J+**	**6 J**	**3.3**	**3.3**
Toluene	108-88-3	110	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	10 U	--	--	--	2.3 U	10 U	--	--
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	--	1 U	1 U	0.4 U	0.75 U	--	1 U	1 U
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	10 U	1 U	1 U	0.4 U	0.75 U	10 U	1 U	1 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	--	1 U	1 U	0.8 U	0.75 U	--	1 U	1 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	10 U	1 U	1 U	0.2 U	0.75 U	10 U	1 U	1 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW02S	03MW02S	03MW02S	03MW02S	03MW02S	03MW02SI	03MW02SI	03MW02SI
					Sample ID	03MW02S_19970626	03MW02S-20080318	03MW02S-20081016	03MW02S-20170519	03MW02S-20190917	03MW02SI_19970707	03MW02SI-20080318	03MW02SI-20081017
					Sample Date	6/26/1997	3/18/2008	10/16/2008	5/19/2017	9/17/2019	7/7/1997	3/18/2008	10/17/2008
					Sample Code	N	N	N	N	N	N	N	N
Metals (Total)													
Aluminum[3]	7429-90-5	200	MCL	µg/L		50 U	80 U	--	--	59 U	50 U	80 U	--
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L		20 U	2 U	--	--	1.5 U	20 U	2 U	--
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L		1 U	6 U	--	--	2 U	1 U	**0.4 J**	--
Barium	7440-39-3	380	Tap Water RSL	µg/L		**111**	**123**	--	--	**100**	**325**	**347**	--
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L		1 U	1 U	--	--	0.7 U	1 U	1 U	--
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L		5 U	1 U	--	--	0.7 U	5 U	1 U	--
Calcium	7440-70-2	--	--	µg/L		**9190**	**9590**	--	--	**8500**	**24200**	**23700**	--
Chromium	7440-47-3	100	MCL	µg/L		5 U	**1.9 B**	--	--	**2.9**	5 U	**2.1 B**	--
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L		5 U	6 U	--	--	3.7 U	**10.3**	**0.2 J**	--
Copper	7440-50-8	80	Tap Water RSL	µg/L		10 U	**0.3 B**	--	--	2.8 U	10 U	**0.3 B**	--
Iron[3]	7439-89-6	300	MCL	µg/L		50 U	70 U	--	--	37 U	**108 J**	**30 J**	--
Lead	7439-92-1	15	MCL	µg/L		1 U	2 U	--	--	1.5 U	1 U	2 U	--
Magnesium	7439-95-4	--	--	µg/L		**3710**	**4060**	--	--	**3900**	**9150**	**9150**	--
Manganese	7439-96-5	43	Tap Water RSL	µg/L		5 U	**2.5 J**	--	--	3.7 U	**5.4**	**1.6 J**	--
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L		0.2 U	0.5 U	--	--	0.33 U	0.2 U	0.5 U	--
Nickel	7440-02-0	39	Tap Water RSL	µg/L		20 U	**1.6 J**	--	--	**2.5 J**	20 U	**1.3 J**	--
Potassium	7440-09-7	--	--	µg/L		1500 U	**930**	--	--	**1100**	1500 U	**640**	--
Selenium	7782-49-2	10	Tap Water RSL	µg/L		5 U	6 U	--	--	3.7 U	5 U	6 U	--
Silver	7440-22-4	9.4	Tap Water RSL	µg/L		5 U	**0.6 B**	--	--	1.5 U	5 U	**0.6 B**	--
Sodium	7440-23-5	20000	Health Advisory	µg/L		**7540**	**7580**	--	--	**7600**	**8140**	**7600**	--
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L		1 U	1 U	--	--	0.7 U	1 U	1 U	--
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L		5 U	**0.3 B**	--	--	1.5 U	5 U	**2.6**	--
Zinc	7440-66-6	600	Tap Water RSL	µg/L		5 U	**2.7 J**	--	--	4.5 U	**5**	**2 J**	--
Radionuclides													
Radium-226	13982-63-3	0.0004	--	pCi/L		--	--	--	--	**0.49**	--	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L		--	--	--	--	0.12 U	--	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L		--	--	--	--	**0.199**	--	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable.
Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

				Location	03MW02SI	03MW02SI	03MW03I		03MW03I		03MW03I	03MW03I
				Sample ID	03MW02SI-20170519	03MW02SI-20190917	03MW03I_19910923	03MW03I_19910923-D	03MW03I_19970630	03MW03I_19970630-D	03MW03I-20080317	03MW03I-20081021
				Sample Date	5/19/2017	9/17/2019	9/23/1991	9/23/1991	6/30/1997	6/30/1997	3/17/2008	10/21/2008
				Sample Code	N	N	N	FD	N	FD	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**								
Volatile Organic Compounds												
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	0.8 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	0.8 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	1.6 U	0.75 U	--	--	--	--	1 U	1 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	0.8 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	0.8 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	0.8 U	0.75 U	--	--	--	--	2 U	2 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	0.8 U	0.75 U	--	--	--	--	2 U	2 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	1.6 U	2.5 U	--	--	--	--	7 U	7 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	0.5 U	62.5 U	--	--	--	--	--	320 U
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	4 U	3.8 U	10 U	10 U	10 U	10 U	10 UR	10 UR
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	4 U	3.8 U	10 U	10 U	10 U	10 U	5 U	5 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	3.2 U	3.8 U	10 U	10 U	10 U	10 U	5 U	5 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	6.4 U	3.8 U	10 U	10 U	10 U	10 U	10 UR	10 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	0.2 U	0.75 U	--	--	--	--	1 U	1 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	0.8 U	0.75 U	10 U	10 U	10 U	10 U	1 U	1 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	1.6 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	**0.4 J**	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	1.6 U	0.75 U	10 U	10 U	10 U	10 U	1 U	1 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	0.8 U	0.75 U	10 U	10 U	10 U	10 U	1 U	1 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	0.8 U	0.75 U	--	--	--	--	1 U	1 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	0.8 U	0.75 U	--	--	--	--	1 U	1 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	4 U	0.75 U	--	--	--	--	2 U	2 U
Methyl Cyclohexane	108-87-2	--	--	µg/L	0.8 U	0.75 U	--	--	--	--	1 U	1 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	0.8 U	0.75 U	--	--	--	--	1 U	1 U
Methylene Chloride	75-09-2	5	MCL	µg/L	0.8 U	0.75 U	5 U	5 U	**4 B**	10 UJ	1 U	1 U
Styrene	100-42-5	100	MCL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**1**	0.75 U	**5**	**5**	**6 J**	**6 J**	**6.9**	**10.4**
Toluene	108-88-3	110	Tap Water RSL	µg/L	**0.7 J**	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	--	2.3 U	5 U	5 U	10 U	10 U	--	--
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	0.4 U	0.75 U	--	--	--	--	1 U	1 U
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	0.4 U	0.75 U	5 U	5 U	10 U	10 U	1 U	1 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	0.8 U	0.75 U	--	--	--	--	1 U	1 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	0.2 U	0.75 U	10 U	10 U	10 U	10 U	1 U	1 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

				Location	03MW02SI	03MW02SI	03MW03I		03MW03I		03MW03I	03MW03I
				Sample ID	03MW02SI-20170519	03MW02SI-20190917	03MW03I_19910923	03MW03I_19910923-D	03MW03I_19970630	03MW03I_19970630-D	03MW03I-20080317	03MW03I-20081021
				Sample Date	5/19/2017	9/17/2019	9/23/1991	9/23/1991	6/30/1997	6/30/1997	3/17/2008	10/21/2008
				Sample Code	N	N	N	FD	N	FD	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**								
Metals (Total)												
Aluminum[3]	7429-90-5	200	MCL	µg/L	--	59 U	**87 B**	**87 B**	50 U	50 U	80 U	--
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L	--	1.5 U	45 U	45 U	20 U	20 U	2 U	--
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L	--	2 U	**2.4 J**	**2.4 J**	**2.4**	**2.5 B**	**1.4 J**	--
Barium	7440-39-3	380	Tap Water RSL	µg/L	--	**320**	**175**	**177**	**197**	**194 B**	**209**	--
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L	--	0.7 U	**3 B**	**3 B**	1 U	1 U	1 U	--
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L	--	0.7 U	4 U	4 U	5 U	5 U	1 U	--
Calcium	7440-70-2	--	--	µg/L	--	**24900**	**16900**	**177**	**21000**	**20900**	**23700**	--
Chromium	7440-47-3	100	MCL	µg/L	--	**2.2**	**14 B**	7 U	5 U	5 U	**1.2 B**	--
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L	--	3.7 U	10 U	10 U	5 U	5 U	6 U	--
Copper	7440-50-8	80	Tap Water RSL	µg/L	--	3.7 U	**6 B**	**6 B**	10 U	10 U	6 U	--
Iron[3]	7439-89-6	300	MCL	µg/L	--	37 U	**80 B**	**43 B**	50 U	50 U	70 U	--
Lead	7439-92-1	15	MCL	µg/L	--	1.5 U	1 U	1 U	1 U	1 U	2 U	--
Magnesium	7439-95-4	--	--	µg/L	--	**12800**	**10200**	**10500**	**11400**	**11200**	**11400**	--
Manganese	7439-96-5	43	Tap Water RSL	µg/L	--	3.7 U	**2**	**1**	5 U	5 U	6 U	--
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L	--	0.33 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U	--
Nickel	7440-02-0	39	Tap Water RSL	µg/L	--	3.7 U	**15 B**	12 U	20 U	20 U	**0.7 J**	--
Potassium	7440-09-7	--	--	µg/L	--	**770**	2140 U	2140 U	1500 U	1500 U	**1200**	--
Selenium	7782-49-2	10	Tap Water RSL	µg/L	--	3.7 U	4 UL	4 UL	5 UL	5 UL	**1 J**	--
Silver	7440-22-4	9.4	Tap Water RSL	µg/L	--	1.5 U	6 U	6 U	5 U	5 U	**0.6 B**	--
Sodium	7440-23-5	20000	Health Advisory	µg/L	--	**11500**	**5930**	**6120**	**6840**	**6700**	**8180**	--
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L	--	0.7 U	2 UJ	2 UJ	1 U	1 U	1 U	--
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L	--	**2 J**	4 U	4 U	5 U	5 U	**1.8**	--
Zinc	7440-66-6	600	Tap Water RSL	µg/L	--	2.3 U	**3 B**	**7 B**	5 U	5 U	6 U	--
Radionuclides												
Radium-226	13982-63-3	0.0004	--	pCi/L	--	**0.61**	--	--	--	--	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L	--	0.39 U	--	--	--	--	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L	--	**0.166**	--	--	--	--	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable. Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

			Location	03MW03I	03MW03I	03MW03I	03MW03S	03MW03S	03MW03S	03MW03S	03MW03S
			Sample ID	03MW03I-200904011	03MW03I-20170522	03MW03I-20190920	03MW03S_19910918	03MW03S_19970625	03MW03S-20080317	03MW03S-20081020	03MW03S-L-20081020
			Sample Date	4/1/2009	5/22/2017	9/20/2019	9/18/1991	6/25/1997	3/17/2008	10/20/2008	10/20/2008
			Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**							
Volatile Organic Compounds											
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	5 U	10 U	1 U	1 U	1 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	5 U	10 U	1 U	1 U	1 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	1 U	1.6 U	0.75 U	--	--	1 U	1 U	1 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	5 U	10 U	1 U	1 U	1 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	1 U	0.8 U	0.75 UJ	5 U	10 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	2 U	0.8 U	0.75 UJ	--	--	2 U	2 U	2 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	2 U	0.8 U	0.75 U	--	--	2 U	2 U	2 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	7 U	1.6 U	2.5 U	--	--	7 U	7 U	7 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	--	1 U	1 U	1 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	--	1 U	1 U	1 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	--	1 U	1 U	1 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	--	1 U	1 U	1 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	--	--	62.5 UJ	--	--	--	320 U	320 U
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 UR	4 U	3.8 UJ	10 U	10 U	10 UR	10 UR	10 UR
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	5 U	4 U	3.8 U	10 U	10 U	5 U	5 U	5 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	5 U	3.2 U	3.8 U	10 U	10 U	5 U	5 U	5 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 UR	6.4 U	3.8 U	10 U	10 U	10 UR	10 U	10 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	1 U	0.2 U	0.75 U	--	--	1 U	1 U	1 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	1 U	0.8 U	0.75 UJ	10 U	10 U	1 U	1 U	1 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	1 U	1.6 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	1 U	1.6 U	0.75 U	10 U	10 U	1 U	1 U	1 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	10 U	10 U	1 U	1 U	1 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	1 U	0.4 U	**0.52 J**	--	--	1 U	1 U	1 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	--	--	1 U	1 U	1 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	--	--	1 U	1 U	1 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	--	1 U	1 U	1 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	2 U	4 U	0.75 UJ	--	--	2 U	2 U	2 U
Methyl Cyclohexane	108-87-2	--	--	µg/L	1 U	0.8 U	0.75 U	--	--	1 U	1 U	1 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	--	--	1 U	1 U	1 U
Methylene Chloride	75-09-2	5	MCL	µg/L	1 U	0.8 U	0.75 U	**3 B**	**15 B**	1 U	1 U	1 U
Styrene	100-42-5	100	MCL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**4.3**	**2.1**	**1.4**	**8**	**5 J**	**2.5**	**2.6**	**2.1**
Toluene	108-88-3	110	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	--	--	2.3 U	5 U	10 U	--	--	--
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	1 U	0.4 U	0.75 UJ	--	--	1 U	1 U	1 U
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	5 U	10 U	1 U	1 U	1 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	1 U	**0.48 J**	0.75 U	5 U	10 U	1 U	1 U	1 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	--	--	1 U	1 U	1 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	1 U	0.2 U	0.75 U	10 U	10 U	1 U	1 U	1 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW03I	03MW03I	03MW03S	03MW03S	03MW03S	03MW03S	03MW03S
					Sample ID	03MW03I-200904011	03MW03I-20170522	03MW03I-20190920	03MW03S_19910918	03MW03S_19970625	03MW03S-20080317	03MW03S-20081020	03MW03S-L-20081020
					Sample Date	4/1/2009	5/22/2017	9/20/2019	9/18/1991	6/25/1997	3/17/2008	10/20/2008	10/20/2008
					Sample Code	N	N	N	N	N	N	N	N
Metals (Total)													
Aluminum[3]	7429-90-5	200	MCL	µg/L	--	--	59 U	**214 B**	**50.4 B**	80 U	--	--
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L	--	--	1.5 U	45 U	20 U	2 U	--	--
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L	--	--	**2.1 J**	2 U	1 U	6 U	--	--
Barium	7440-39-3	380	Tap Water RSL	µg/L	--	--	**250**	**154**	**147**	**157**	--	--
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L	--	--	0.7 U	**3 B**	1 U	1 U	--	--
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L	--	--	0.7 U	4 U	5 U	1 U	--	--
Calcium	7440-70-2	--	--	µg/L	--	--	**28000**	**15100**	**14700**	**13800**	--	--
Chromium	7440-47-3	100	MCL	µg/L	--	--	**0.79 J**	**8 B**	5 U	**2.4 B**	--	--
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L	--	--	3.7 U	10 U	5 U	6 U	--	--
Copper	7440-50-8	80	Tap Water RSL	µg/L	--	--	3.7 U	**7 B**	10 U	**1 B**	--	--
Iron[3]	7439-89-6	300	MCL	µg/L	--	--	37 U	**243**	50 U	**40 J**	--	--
Lead	7439-92-1	15	MCL	µg/L	--	--	1.5 U	1 U	**14.4 B**	2 U	--	--
Magnesium	7439-95-4	--	--	µg/L	--	--	**15500**	**4570**	**4950**	**5580**	--	--
Manganese	7439-96-5	43	Tap Water RSL	µg/L	--	--	3.7 U	**10 B**	5 U	**3.3 J**	--	--
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L	--	--	0.33 U	0.2 U	0.2 U	0.5 U	--	--
Nickel	7440-02-0	39	Tap Water RSL	µg/L	--	--	3.7 U	12 U	20 U	**2.7 J**	--	--
Potassium	7440-09-7	--	--	µg/L	--	--	**1400**	2140 U	1500 U	**1180**	--	--
Selenium	7782-49-2	10	Tap Water RSL	µg/L	--	--	3.7 U	4 U	5 U	**2 J**	--	--
Silver	7440-22-4	9.4	Tap Water RSL	µg/L	--	--	1.5 U	6 U	5 U	**0.6 B**	--	--
Sodium	7440-23-5	20000	Health Advisory	µg/L	--	--	**8400**	**7700**	**7320**	**11300**	--	--
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L	--	--	0.7 U	2 U	1 U	1 U	--	--
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L	--	--	**1.9 J**	4 U	5 U	**0.3 B**	--	--
Zinc	7440-66-6	600	Tap Water RSL	µg/L	--	--	3.2 U	**8 B**	**12 B**	**4.3 J**	--	--
Radionuclides													
Radium-226	13982-63-3	0.0004	--	pCi/L	--	--	0.16 U	--	--	--	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L	--	--	-0.21 U	--	--	--	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L	--	--	0.1 U	--	--	--	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable.
Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

					Location	03MW03S		03MW03S		03MW03S	03MW03SI	03MW03SI	03MW03SI
					Sample ID	03MW03S-20090401	03MW03S-20090401-D	03MW03S-20170522	03MW03S-20170522-D	03MW03S-20190916	03MW03SI_19910920	03MW03SI_19970625	03MW03SI-20080317
					Sample Date	4/1/2009	4/1/2009	5/22/2017	5/22/2017	9/16/2019	9/20/1991	6/25/1997	3/17/2008
					Sample Code	N	FD	N	FD	N	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**									
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	5 U	10 U	1 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	5 U	10 U	1 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	1 U	1 U	1.6 U	1.6 U	0.75 U	--	--	1 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	5 U	10 U	1 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	5 U	10 U	1 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	2 U	2 U	0.8 U	0.8 U	0.75 U	--	--	2 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	2 U	2 U	0.8 U	0.8 U	0.75 U	--	--	2 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	7 U	7 U	1.6 U	1.6 U	2.5 U	--	--	7 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	--	--	--	--	62.5 U	--	--	--
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 UR	10 UR	4 U	4 U	3.8 U	10 U	10 U	10 UR
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	5 U	5 U	4 U	4 U	3.8 U	10 U	10 U	5 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	5 U	5 U	3.2 U	3.2 U	3.8 U	10 U	10 U	5 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 UR	10 UR	6.4 U	6.4 U	3.8 U	10 U	10 U	10 UR
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	1 U	1 U	0.2 U	0.2 U	0.75 U	--	--	1 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	10 U	10 U	1 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	1 U	1 U	1.6 U	1.6 U	0.75 U	5 U	10 U	1 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	1 U	1 U	1.6 U	1.6 U	0.75 U	10 U	10 U	1 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	10 U	10 U	1 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	--	--	1 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	--	--	1 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	2 U	2 U	4 U	4 U	0.75 U	--	--	2 U
Methyl Cyclohexane	108-87-2	--	--	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	--	--	1 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	**0.63 J**	**0.42 J**	0.8 U	0.8 U	0.75 U	--	--	1 U
Methylene Chloride	75-09-2	5	MCL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	5 U	**13 B**	1 U
Styrene	100-42-5	100	MCL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**3**	**3.2**	**3.1**	**2.6**	**3.1**	**35**	**18**	**12**
Toluene	108-88-3	110	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	--	--	--	--	2.3 U	5 U	10 U	--
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	--	--	1 U
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.4 U	0.75 U	5 U	10 U	1 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.8 U	0.75 U	--	--	1 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	1 U	1 U	0.2 U	0.2 U	0.75 U	10 U	10 U	1 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

					Location	03MW03S		03MW03S		03MW03S	03MW03SI	03MW03SI	03MW03SI
					Sample ID	03MW03S-20090401	03MW03S-20090401-D	03MW03S-20170522	03MW03S-20170522-D	03MW03S-20190916	03MW03SI_19910920	03MW03SI_19970625	03MW03SI-20080317
					Sample Date	4/1/2009	4/1/2009	5/22/2017	5/22/2017	9/16/2019	9/20/1991	6/25/1997	3/17/2008
					Sample Code	N	FD	N	FD	N	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**									
Metals (Total)													
Aluminum[3]	7429-90-5	200	MCL	µg/L	--	--	--	--	59 U	72 UJ	**75.4 B**	80 U
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L	--	--	--	--	1.5 U	45 U	20 U	2 U
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L	--	--	--	--	**1 J**	2 UJ	1 U	6 U
Barium	7440-39-3	380	Tap Water RSL	µg/L	--	--	--	--	**160**	**250**	**294**	**353**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L	--	--	--	--	0.7 U	**3 B**	1 U	1 U
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L	--	--	--	--	0.7 U	**4**	5 U	1 U
Calcium	7440-70-2	--	--	µg/L	--	--	--	--	**18800**	**19500**	**22600**	**25900**
Chromium	7440-47-3	100	MCL	µg/L	--	--	--	--	**1 J**	7 U	5 U	**1.8 B**
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L	--	--	--	--	3.7 U	10 U	5 U	6 U
Copper	7440-50-8	80	Tap Water RSL	µg/L	--	--	--	--	3.7 U	**9 B**	10 U	6 U
Iron[3]	7439-89-6	300	MCL	µg/L	--	--	--	--	**440**	**43 B**	50 U	70 U
Lead	7439-92-1	15	MCL	µg/L	--	--	--	--	1.5 U	1 U	**13 B**	2 U
Magnesium	7439-95-4	--	--	µg/L	--	--	--	--	**7100**	**7710**	**8370**	**9960**
Manganese	7439-96-5	43	Tap Water RSL	µg/L	--	--	--	--	**27**	**1**	5 U	6 U
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L	--	--	--	--	0.33 U	0.2 U	0.2 U	**0.03 J**
Nickel	7440-02-0	39	Tap Water RSL	µg/L	--	--	--	--	3.7 U	12 U	20 U	**0.9 J**
Potassium	7440-09-7	--	--	µg/L	--	--	--	--	**1000**	2140 U	1500 U	**670**
Selenium	7782-49-2	10	Tap Water RSL	µg/L	--	--	--	--	3.7 U	20 UJ	5 UL	**2 J**
Silver	7440-22-4	9.4	Tap Water RSL	µg/L	--	--	--	--	1.5 U	6 U	5 U	**0.6 B**
Sodium	7440-23-5	20000	Health Advisory	µg/L	--	--	--	--	**8900**	**6420**	**7840**	**9300**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L	--	--	--	--	0.7 U	2 UJ	1 U	1 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L	--	--	--	--	**1.3 J**	4 U	5 U	**1.5**
Zinc	7440-66-6	600	Tap Water RSL	µg/L	--	--	--	--	4.3 U	**5 B**	5 U	6 U
Radionuclides													
Radium-226	13982-63-3	0.0004	--	pCi/L	--	--	--	--	0.31 U	--	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L	--	--	--	--	0.35 U	--	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L	--	--	--	--	**0.101**	--	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable.
Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW04I	03MW04I
					Sample ID	03MW03SI-20080317-D	03MW03SI-20081021	03MW03SI-20090401	03MW03SI-20170519	03MW03SI-20190920	03MW03SI-20190920-D	03MW04I_19910920	03MW04I_19970630
					Sample Date	3/17/2008	10/21/2008	4/1/2009	5/19/2017	9/20/2019	9/20/2019	9/20/1991	6/30/1997
					Sample Code	FD	N	N	N	N	FD	N	N
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	5 U	10 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	5 U	10 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L		1 U	1 U	1 U	1.6 U	0.75 U	0.75 U	--	--
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	5 U	10 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L		1 U	1 U	1 U	0.8 U	0.75 UJ	0.75 UJ	5 U	10 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L		2 U	2 U	2 U	0.8 U	0.75 UJ	0.75 UJ	--	--
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L		2 U	2 U	2 U	0.8 U	0.75 U	0.75 U	--	--
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L		7 U	7 U	7 U	1.6 U	2.5 U	2.5 U	--	--
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	--
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	--
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	--
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	--
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L		--	320 U	--	0.5 U	62.5 UJ	62.5 UJ	--	--
2-Butanone	78-93-3	560	Tap Water RSL	µg/L		10 UR	10 UR	10 UR	4 U	3.8 UJ	3.8 UJ	10 U	10 U
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L		5 U	5 U	5 U	4 U	3.8 U	3.8 U	10 U	10 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L		5 U	5 U	5 U	3.2 U	3.8 U	3.8 U	10 U	10 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L		10 UR	10 U	10 UR	6.4 U	3.8 U	3.8 U	10 U	10 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L		1 U	1 U	1 U	0.2 U	0.75 U	0.75 U	--	--
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 UJ	0.75 UJ	10 U	10 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L		1 U	1 U	1 U	1.6 U	0.75 U	0.75 U	5 U	10 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L		1 U	1 U	1 U	**0.39 J**	0.75 U	0.75 U	5 U	10 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L		1 U	1 U	1 U	1.6 U	0.75 U	0.75 U	10 U	10 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L		1 U	**0.57 J**	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	10 U	10 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	--
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	--
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	--
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	--
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L		2 U	2 U	2 U	4 U	0.75 UJ	0.75 UJ	--	--
Methyl Cyclohexane	108-87-2	--	--	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	--
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	--
Methylene Chloride	75-09-2	5	MCL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	5 U	10 UJ
Styrene	100-42-5	100	MCL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L		**11.7**	**12.4**	**10.8**	**5.2**	**7.2**	**7.3**	5 U	10 U
Toluene	108-88-3	110	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L		--	--	--	--	2.3 U	2.3 U	5 U	10 U
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 UJ	0.75 UJ	--	--
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L		1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	5 U	10 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L		1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	--
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L		1 U	1 U	1 U	0.2 U	0.75 U	0.75 U	10 U	10 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW03SI	03MW04I	03MW04I
					Sample ID	03MW03SI-20080317-D	03MW03SI-20081021	03MW03SI-20090401	03MW03SI-20170519	03MW03SI-20190920	03MW03SI-20190920-D	03MW04I_19910920	03MW04I_19970630
					Sample Date	3/17/2008	10/21/2008	4/1/2009	5/19/2017	9/20/2019	9/20/2019	9/20/1991	6/30/1997
					Sample Code	FD	N	N	N	N	FD	N	N
Metals (Total)													
Aluminum[3]	7429-90-5	200	MCL	µg/L		80 U	--	--	--	59 U	59 U	**87 B**	50 U
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L		**0.08 J**	--	--	--	1.5 U	1.5 U	45 U	20 U
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L		**0.5 J**	--	--	--	2 U	2 U	2 UJ	1 U
Barium	7440-39-3	380	Tap Water RSL	µg/L		**362**	--	--	--	**300**	**300**	**405**	**395**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	0.7 U	**3 B**	1 U
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	0.7 U	4 U	5 U
Calcium	7440-70-2	--	--	µg/L		**25600**	--	--	--	**22500**	**22200**	**24000**	**25600**
Chromium	7440-47-3	100	MCL	µg/L		**1.4 B**	--	--	--	1.5 U	1.5 U	7 U	5 U
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L		6 U	--	--	--	3.7 U	3.7 U	10 U	5 U
Copper	7440-50-8	80	Tap Water RSL	µg/L		6 U	--	--	--	3.9 U	3.7 U	**6 B**	10 U
Iron[3]	7439-89-6	300	MCL	µg/L		70 U	--	--	--	37 U	37 U	**35 B**	50 U
Lead	7439-92-1	15	MCL	µg/L		2 U	--	--	--	1.5 U	1.5 U	1 U	1 U
Magnesium	7439-95-4	--	--	µg/L		**9860**	--	--	--	**9200**	**9100**	**6440**	**6220**
Manganese	7439-96-5	43	Tap Water RSL	µg/L		6 U	--	--	--	3.7 U	3.7 U	**1**	5 U
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L		0.5 U	--	--	--	0.33 U	0.33 U	0.2 U	0.2 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L		**0.8 J**	--	--	--	3.7 U	3.7 U	12 U	20 U
Potassium	7440-09-7	--	--	µg/L		**670**	--	--	--	**590**	**580**	2140 U	1500 U
Selenium	7782-49-2	10	Tap Water RSL	µg/L		**2 J**	--	--	--	3.7 U	3.7 U	20 UJ	5 UL
Silver	7440-22-4	9.4	Tap Water RSL	µg/L		**0.7 B**	--	--	--	1.5 U	1.5 U	6 U	5 U
Sodium	7440-23-5	20000	Health Advisory	µg/L		**9470**	--	--	--	**9100**	**8800**	**8900**	**11100**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	0.4 U	2 UJ	1 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L		**1.5**	--	--	--	**1.8 J**	**1.8 J**	4 U	5 U
Zinc	7440-66-6	600	Tap Water RSL	µg/L		6 U	--	--	--	5 U	3.1 U	**3 B**	5 U
Radionuclides													
Radium-226	13982-63-3	0.0004	--	pCi/L		--	--	--	--	0.13 U	**1.61**	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L		--	--	--	--	-0.16 U	-0.27 U	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L		--	--	--	--	0.066 U	**0.119**	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable. Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

					Location	03MW04I	03MW04I	03MW04I	03MW04I	03MW04I	03MW04S	03MW04S	03MW04S
					Sample ID	03MW04I-20080314	03MW04I-20090402	03MW04I-20081014	03MW04I-20170519	03MW04I-20190920	03MW04S_19910918	03MW04S_19970625	03MW04S-20080314
					Sample Date	3/14/2008	4/2/2009	10/14/2018	5/19/2017	9/20/2019	9/18/1991	6/25/1997	3/14/2008
					Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**									
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	5 U	10 U	1 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	5 U	10 U	1 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	1 U	1 U	1 U	1.6 U	0.75 U	--	--	1 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	5 U	10 U	1 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	1 U	1 U	1 U	0.8 U	0.75 UJ	5 U	10 U	1 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	2 U	2 U	2 U	0.8 U	0.75 UJ	--	--	2 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	2 U	2 U	2 U	0.8 U	0.75 U	--	--	2 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	7 U	7 U	7 U	1.6 U	2.5 U	--	--	7 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	--	--	1 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	--	--	1 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	--	--	1 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	--	--	1 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	--	--	320 U	0.5 U	62.5 UJ	--	--	--
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 UR	10 UR	10 U	4 U	3.8 UJ	10 U	10 U	10 UR
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	5 U	5 U	5 U	4 U	3.8 U	10 U	10 U	5 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	5 U	5 U	5 U	3.2 U	3.8 U	10 U	10 U	5 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 UR	10 UR	10 U	6.4 U	3.8 U	10 U	10 U	10 UR
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	--	--	1 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	**1.1**
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	**0.87 J**
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 UJ	10 U	10 U	1 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	1 U	1 U	1 U	1.6 U	0.75 U	5 U	10 U	1 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	1 U	1 U	1 U	1.6 U	0.75 U	10 U	10 U	1 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	**0.4 J**
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	10 U	10 U	1 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	--	--	1 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	--	--	1 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	**1.5**
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	--	--	1 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	--	--	1 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	2 U	2 U	2 U	4 U	0.75 UJ	--	--	2 U
Methyl Cyclohexane	108-87-2	--	--	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	--	--	1 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	--	--	1 U
Methylene Chloride	75-09-2	5	MCL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	5 U	**18 B**	1 U
Styrene	100-42-5	100	MCL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**0.45 J**	**0.41 J**	1 U	**0.22 J**	0.75 U	**61**	**21**	**4.5**
Toluene	108-88-3	110	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	--	--	--	--	2.3 U	5 U	10 U	--
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 UJ	--	--	1 U
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	5 U	10 U	1 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	--	--	1 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	10 U	10 U	1 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW04I	03MW04I	03MW04I	03MW04I	03MW04I	03MW04S	03MW04S	03MW04S
					Sample ID	03MW04I-20080314	03MW04I-20090402	03MW04I-20081014	03MW04I-20170519	03MW04I-20190920	03MW04S_19910918	03MW04S_19970625	03MW04S-20080314
					Sample Date	3/14/2008	4/2/2009	10/14/2018	5/19/2017	9/20/2019	9/18/1991	6/25/1997	3/14/2008
					Sample Code	N	N	N	N	N	N	N	N
Metals (Total)													
Aluminum[3]	7429-90-5	200	MCL	µg/L		80 U	--	--	--	59 U	**551 B**	**67.1 B**	80 U
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L		**0.7 J**	--	--	--	1.5 U	45 U	20 U	**0.2 J**
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L		**0.6 J**	--	--	--	2 U	2 U	1 U	6 U
Barium	7440-39-3	380	Tap Water RSL	µg/L		**455**	--	--	--	**430**	**306**	**322**	**434**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	**3 B**	1 U	1 U
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	4 U	5 U	1 U
Calcium	7440-70-2	--	--	µg/L		**31900**	--	--	--	**35500**	**22900**	**26300**	**36500**
Chromium	7440-47-3	100	MCL	µg/L		**1 J**	--	--	--	1.5 U	7 U	5 U	**5.4 B**
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L		6 U	--	--	--	3.7 U	10 U	5 U	6 U
Copper	7440-50-8	80	Tap Water RSL	µg/L		**0.08 J**	--	--	--	4.6 U	**7 B**	10 U	**1.3 B**
Iron[3]	7439-89-6	300	MCL	µg/L		**40 J**	--	--	--	37 U	**562**	**59.6**	70 U
Lead	7439-92-1	15	MCL	µg/L		2 U	--	--	--	1.5 U	1 U	1 U	2 U
Magnesium	7439-95-4	--	--	µg/L		**8260**	--	--	--	**10900**	**8460**	**9040**	**13200**
Manganese	7439-96-5	43	Tap Water RSL	µg/L		6 U	--	--	--	3.7 U	**50**	**5.1 K**	**1 J**
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L		0.5 U	--	--	--	0.33 U	0.2 U	0.2 U	0.5 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L		**1.8 J**	--	--	--	3.7 U	12 U	20 U	**4.2 J**
Potassium	7440-09-7	--	--	µg/L		**680**	--	--	--	**810**	2140 U	1500 U	**840**
Selenium	7782-49-2	10	Tap Water RSL	µg/L		**3 J**	--	--	--	**1.9 J**	20 U	5 UL	**1 J**
Silver	7440-22-4	9.4	Tap Water RSL	µg/L		1 U	--	--	--	1.5 U	6 U	5 U	**0.7 B**
Sodium	7440-23-5	20000	Health Advisory	µg/L		**13300**	--	--	--	**15600**	**7780**	**9230**	**12100**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	2 U	1 U	1 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L		1 U	--	--	--	1.5 U	**5 B**	5 U	**0.8 B**
Zinc	7440-66-6	600	Tap Water RSL	µg/L		**6.2**	--	--	--	5.6 U	**8 B**	5 U	6 U
Radionuclides													
Radium-226	13982-63-3	0.0004	--	pCi/L		--	--	--	--	0.04 U	--	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L		--	--	--	--	0.08 U	--	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L		--	--	--	--	**0.128**	--	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable.
Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

			Location	03MW04S	03MW04S	03MW04S	03MW04S	03MW04SI	03MW04SI		03MW04SI
			Sample ID	03MW04S-20081016	03MW04S-20090402	03MW04S-20170519	03MW04S-20190918	03MW04SI_19910920	03MW04SI_19970625	03MW04SI_19970625-D	03MW04SI-20080314
			Sample Date	10/16/2008	4/2/2009	5/19/2017	9/18/2019	9/20/1991	6/25/1997	6/25/1997	3/14/2008
			Sample Code	N	N	N	N	N	N	FD	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**							
Volatile Organic Compounds											
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 U	5 U	10 U	10 U	1 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 U	5 U	10 U	10 U	1 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	1 U	1 U	1.6 U	0.75 U	--	--	--	1 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 U	5 U	10 U	10 U	1 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	1 U	1 U	0.8 U	0.75 UJ	5 U	10 U	10 U	1 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	2 U	2 U	0.8 U	0.75 U	--	--	--	2 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	2 U	2 U	0.8 U	0.75 U	--	--	--	2 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	7 U	7 U	1.6 U	2.5 U	--	--	--	7 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	--	--	--	1 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	--	--	--	1 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	--	--	--	1 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	--	--	--	1 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	320 U	--	0.5 U	62.5 UJ	--	--	--	--
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 UR	10 UR	4 U	3.8 UJ	10 U	10 U	10 U	10 UR
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	5 U	5 U	4 U	3.8 U	10 U	10 U	10 U	5 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	5 U	5 U	3.2 U	3.8 U	10 U	10 U	10 U	5 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 U	10 UR	6.4 U	**3.5 J**	10 U	10 U	10 U	10 UR
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	1 U	1 U	0.2 U	0.75 U	--	--	--	1 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 UJ	10 U	10 U	10 U	1 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	1 U	1 U	1.6 U	0.75 U	5 U	10 U	10 U	1 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	1 U	1 U	1.6 U	0.75 U	10 U	10 U	10 U	1 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	**1.6**	1 U	**0.26 J**	0.75 U	5 U	10 U	10 U	**0.22 J**
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 U	10 U	10 U	10 U	1 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	--	--	--	1 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 U	--	--	--	1 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 U	--	--	--	1 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	--	--	--	1 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	2 U	2 U	4 U	0.75 UJ	--	--	--	2 U
Methyl Cyclohexane	108-87-2	--	--	µg/L	1 U	1 U	0.8 U	0.75 U	--	--	--	1 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 U	--	--	--	**0.26 J**
Methylene Chloride	75-09-2	5	MCL	µg/L	1 U	1 U	0.8 U	0.75 U	5 U	**12 B**	**16 B**	1 U
Styrene	100-42-5	100	MCL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**2.7**	**3.1**	**3.2**	**2.8**	**56**	**20**	**22**	**4.6**
Toluene	108-88-3	110	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	--	--	--	2.3 U	5 U	10 U	10 U	--
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 UJ	--	--	--	1 U
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	1 U	1 U	0.4 U	0.75 U	5 U	10 U	10 U	1 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	1 U	1 U	**0.17 J**	0.75 U	5 U	10 U	10 U	1 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	1 U	1 U	0.8 U	0.75 U	--	--	--	1 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	1 U	1 U	0.2 U	0.75 U	10 U	10 U	10 U	1 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW04S	03MW04S	03MW04S	03MW04SI	03MW04SI	03MW04SI	03MW04SI
					Sample ID	03MW04S-20081016	03MW04S-20090402	03MW04S-20170519	03MW04S-20190918	03MW04SI_19910920	03MW04SI_19970625	03MW04SI_19970625-D	03MW04SI-20080314
					Sample Date	10/16/2008	4/2/2009	5/19/2017	9/18/2019	9/20/1991	6/25/1997	6/25/1997	3/14/2008
					Sample Code	N	N	N	N	N	N	FD	N
Metals (Total)													
Aluminum[3]	7429-90-5	200	MCL	µg/L	--	--	--	**190**	**379 B**	**91.9 B**	50 U	80 U
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L	--	--	--	1.5 U	45 U	20 U	20 U	**0.6 J**
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L	--	--	--	2 U	2 UJ	1 U	1 U	**0.6 J**
Barium	7440-39-3	380	Tap Water RSL	µg/L	--	--	--	**380**	**326**	**369**	**364**	**487**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L	--	--	--	0.7 U	**3 B**	1 U	1 U	1 U
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L	--	--	--	0.7 U	4 U	5 U	5 U	1 U
Calcium	7440-70-2	--	--	µg/L	--	--	--	**30600**	**18800**	**24400**	**23900**	**37200**
Chromium	7440-47-3	100	MCL	µg/L	--	--	--	**2.9**	**12 B**	5 U	5 U	**0.9 J**
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L	--	--	--	3.7 U	10 U	5 U	5 U	6 U
Copper	7440-50-8	80	Tap Water RSL	µg/L	--	--	--	2.4 U	**9 B**	10 U	10 U	**0.1 J**
Iron[3]	7439-89-6	300	MCL	µg/L	--	--	--	**560**	**757**	50 U	50 U	**20 J**
Lead	7439-92-1	15	MCL	µg/L	--	--	--	1.5 U	**1.7**	**4.2 B**	1 U	2 U
Magnesium	7439-95-4	--	--	µg/L	--	--	--	**12000**	**5330**	**6150**	**6020**	**9650**
Manganese	7439-96-5	43	Tap Water RSL	µg/L	--	--	--	**170**	**226**	5 U	5 U	6 U
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L	--	--	--	0.33 U	0.2 U	0.2 U	0.2 U	0.5 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L	--	--	--	**2.4 J**	**15 B**	20 U	20 U	**2.6 J**
Potassium	7440-09-7	--	--	µg/L	--	--	--	**720**	2140 U	1500 U	1500 U	**880**
Selenium	7782-49-2	10	Tap Water RSL	µg/L	--	--	--	3.7 U	20 UJ	5 UL	5 U	**3 J**
Silver	7440-22-4	9.4	Tap Water RSL	µg/L	--	--	--	1.5 U	6 U	5 U	5 U	1 U
Sodium	7440-23-5	20000	Health Advisory	µg/L	--	--	--	**13900**	**9880**	**12100**	**11900**	**17600**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L	--	--	--	0.7 U	2 UJ	1 U	1 U	1 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L	--	--	--	**1.4 J**	4 U	5 U	5 U	1 U
Zinc	7440-66-6	600	Tap Water RSL	µg/L	--	--	--	**6.1**	**9 B**	5 U	5 U	**1.9 J**
Radionuclides													
Radium-226	13982-63-3	0.0004	--	pCi/L	--	--	--	0.11 U	--	--	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L	--	--	--	0.38 U	--	--	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L	--	--	--	**0.167**	--	--	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable. Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

			Location	03MW04SI	03MW04SI	03MW04SI	03MW04SI	03MW04SI		03MW06S	03MW06S
			Sample ID	03MW04SI-20081014	03MW04SI-L-20081014	03MW04SI-20090402	03MW04SI-20170519	03MW04SI-20190918	03MW04SI-20190918-D	03MW06S_19970630	03MW06S-20080313
			Sample Date	10/14/2008	10/14/2008	4/2/2009	5/19/2017	9/18/2019	9/18/2019	6/30/1997	3/13/2008
			Sample Code	N	N	N	N	N	FD	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**							
Volatile Organic Compounds											
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	10 U	1 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	10 U	1 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	1 U	1 U	1 U	1.6 U	0.75 U	0.75 U	--	1 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	10 U	1 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	1 U	1 U	1 U	0.8 U	0.75 UJ	0.75 U	10 U	1 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	2 U	2 U	2 U	0.8 U	0.75 U	0.75 U	--	2 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	2 U	2 U	2 U	0.8 U	0.75 U	0.75 U	--	2 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	7 U	7 U	7 U	1.6 U	2.5 U	2.5 U	--	7 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	1 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	1 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	1 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	1 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	320 U	320 U	--	0.5 U	62.5 UJ	62.5 UJ	--	--
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 U	10 U	10 UR	4 U	3.8 UJ	3.8 U	10 U	10 UR
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	5 U	5 U	5 U	4 U	3.8 U	3.8 U	10 U	5 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	5 U	5 U	5 U	3.2 U	3.8 U	3.8 U	10 U	5 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 U	10 U	10 UR	6.4 U	5.6	**5.3 J**	10 U	10 UR
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	0.75 U	--	1 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 UJ	0.75 UJ	10 U	1 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	1 U	1 U	1 U	1.6 U	0.75 U	0.75 U	10 U	1 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	1 U	1 U	1 U	1.6 U	0.75 U	0.75 U	10 U	1 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	**1.6**	**1.5**	1 U	**0.21 J**	0.75 U	0.75 U	10 U	1 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	10 U	1 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	1 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	1 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	1 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	--	1 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	2 U	2 U	2 U	4 U	0.75 UJ	0.75 U	--	2 U
Methyl Cyclohexane	108-87-2	--	--	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	1 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	1 U
Methylene Chloride	75-09-2	5	MCL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	10 UJ	1 U
Styrene	100-42-5	100	MCL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**3.9**	**4**	**5.7**	**3.2**	**3.7**	**3.4 J+**	**29**	**0.76 J**
Toluene	108-88-3	110	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	--	--	--	--	2.3 U	2.3 U	10 U	--
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 UJ	0.75 U	--	1 U
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.75 U	10 U	1 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.75 U	--	1 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	0.75 U	10 U	1 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW04SI	03MW04SI	03MW04SI	03MW04SI	03MW04SI	03MW04SI	03MW06S	03MW06S
					Sample ID	03MW04SI-20081014	03MW04SI-L-20081014	03MW04SI-20090402	03MW04SI-20170519	03MW04SI-20190918	03MW04SI-20190918-D	03MW06S_19970630	03MW06S-20080313
					Sample Date	10/14/2008	10/14/2008	4/2/2009	5/19/2017	9/18/2019	9/18/2019	6/30/1997	3/13/2008
					Sample Code	N	N	N	N	N	FD	N	N
Metals (Total)													
Aluminum[3]	7429-90-5	200	MCL	µg/L	--	--	--	--	59 U	59 U	**206**	**89**
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L	--	--	--	--	1.5 U	1.5 U	20 U	**0.7 J**
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L	--	--	--	--	2 U	2 U	1 UL	**0.4 J**
Barium	7440-39-3	380	Tap Water RSL	µg/L	--	--	--	--	**300**	**300**	**102**	**37**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L	--	--	--	--	0.7 U	0.7 U	1 U	**0.1 J**
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L	--	--	--	--	0.7 U	0.7 U	5 U	1 U
Calcium	7440-70-2	--	--	µg/L	--	--	--	--	**32400**	**30300**	**16100**	**12000**
Chromium	7440-47-3	100	MCL	µg/L	--	--	--	--	**2.8**	**4.5**	**10.7 K**	**4.9**
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L	--	--	--	--	3.7 U	3.7 U	5 U	6 U
Copper	7440-50-8	80	Tap Water RSL	µg/L	--	--	--	--	3.7 U	**12**	10 U	**1.7 J**
Iron[3]	7439-89-6	300	MCL	µg/L	--	--	--	--	37 U	37 U	**340 B**	**90 K**
Lead	7439-92-1	15	MCL	µg/L	--	--	--	--	1.5 U	1.5 U	**2.5 B**	2 U
Magnesium	7439-95-4	--	--	µg/L	--	--	--	--	**8400**	**9400**	**6240**	**6420**
Manganese	7439-96-5	43	Tap Water RSL	µg/L	--	--	--	--	3.7 U	3.7 U	**93.2**	**8.2**
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L	--	--	--	--	0.33 U	0.33 U	0.2 U	0.5 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L	--	--	--	--	3.7 U	**2.3 J**	20 U	**5 J**
Potassium	7440-09-7	--	--	µg/L	--	--	--	--	**710**	**860**	1500 U	**1370**
Selenium	7782-49-2	10	Tap Water RSL	µg/L	--	--	--	--	**2.2 J**	3.7 U	5 UL	**5 J**
Silver	7440-22-4	9.4	Tap Water RSL	µg/L	--	--	--	--	1.5 U	1.5 U	5 U	1 U
Sodium	7440-23-5	20000	Health Advisory	µg/L	--	--	--	--	**15800**	**17500**	**14200**	**13500**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L	--	--	--	--	0.7 U	0.7 U	1 U	1 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L	--	--	--	--	1.5 U	1.5 U	5 U	1 U
Zinc	7440-66-6	600	Tap Water RSL	µg/L	--	--	--	--	3 U	**7.3**	**20.8 B**	**8.4**
Radionuclides													
Radium-226	13982-63-3	0.0004	--	pCi/L	--	--	--	--	0.12 U	0.04 U	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L	--	--	--	--	0.23 U	0.03 U	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L	--	--	--	--	**0.082**	0.044 U	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable. Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

				Location	03MW06S	03MW06S	03MW06S	03MW06SI	03MW06SI	03MW06SI	03MW06SI	03MW07S
				Sample ID	03MW06S-20081015	03MW06S-20170522	03MW06S-20190917	03MW06SI_19970618	03MW06SI-20080313	03MW06SI-20081015	03MW06SI-20190917	03MW07S_19970707
				Sample Date	10/15/2008	5/22/2017	9/17/2019	6/18/1997	3/13/2008	10/15/2008	9/17/2019	7/7/1997
				Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**								
Volatile Organic Compounds												
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	1 U	1.6 U	0.75 U	--	1 U	1 U	0.75 U	--
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	1 U	0.8 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	2 U	0.8 U	0.75 U	--	2 U	2 U	0.75 UJ	--
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	2 U	0.8 U	0.75 U	--	2 U	2 U	0.75 U	--
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	7 U	1.6 U	2.5 U	--	7 U	7 U	2.5 U	--
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	320 U	--	62.5 U	--	--	320 U	62.5 UJ	--
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 U	4 U	3.8 U	10 U	10 UR	10 U	3.8 U	10 U
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	5 U	4 U	3.8 U	10 U	5 U	5 U	3.8 U	10 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	5 U	3.2 U	3.8 U	10 U	5 U	5 U	3.8 U	10 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 U	6.4 U	3.8 U	10 U	10 UR	10 U	3.8 U	10 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	1 U	0.2 U	0.75 U	--	1 U	1 U	0.75 U	--
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	1 U	1.6 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	1 U	1.6 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	--	1 U	1 U	0.75 U	--
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	--	1 U	1 U	0.75 U	--
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	2 U	4 U	0.75 U	--	2 U	2 U	0.75 U	--
Methyl Cyclohexane	108-87-2	--	--	µg/L	1 U	0.8 U	0.75 U	--	1 U	1 U	0.75 U	--
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	--	1 U	1 U	0.75 U	--
Methylene Chloride	75-09-2	5	MCL	µg/L	1 U	0.8 U	0.75 U	**8 B**	1 U	1 U	0.75 U	**5 B**
Styrene	100-42-5	100	MCL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**1.8**	**0.44 J**	**0.47 J**	10 U	1 U	1 U	0.75 U	10 U
Toluene	108-88-3	110	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	--	--	2.3 U	10 U	--	--	2.3 U	10 U
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	--	1 U	1 U	0.75 U	--
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	1 U	0.4 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	1 U	0.8 U	0.75 U	--	1 U	1 U	0.75 U	--
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	1 U	0.2 U	0.75 U	10 U	1 U	1 U	0.75 U	10 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

				Location	03MW06S	03MW06S	03MW06S	03MW06SI	03MW06SI	03MW06SI	03MW06SI	03MW07S
				Sample ID	03MW06S-20081015	03MW06S-20170522	03MW06S-20190917	03MW06SI_19970618	03MW06SI-20080313	03MW06SI-20081015	03MW06SI-20190917	03MW07S_19970707
				Sample Date	10/15/2008	5/22/2017	9/17/2019	6/18/1997	3/13/2008	10/15/2008	9/17/2019	7/7/1997
				Sample Code	N	N	N	N	N	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**								
Metals (Total)												
Aluminum[3]	7429-90-5	200	MCL	µg/L	--	--	**47 J**	**466**	**144**	--	59 U	**263**
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L	--	--	1.5 U	20 UL	**0.7 J**	--	1.5 U	20 U
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L	--	--	2 U	1 UL	6 U	--	2 U	1 U
Barium	7440-39-3	380	Tap Water RSL	µg/L	--	--	**36**	**162**	**111**	--	**110**	**339**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L	--	--	0.7 U	1 U	1 U	--	0.7 U	1 U
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L	--	--	0.7 U	5 U	1 U	--	0.7 U	5 U
Calcium	7440-70-2	--	--	µg/L	--	--	**10400**	**7770**	**7310**	--	**10700**	**25700**
Chromium	7440-47-3	100	MCL	µg/L	--	--	**4**	**36.9**	**5.1**	--	**4.7**	5 U
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L	--	--	3.7 U	**6.6**	6 U	--	3.7 U	5 U
Copper	7440-50-8	80	Tap Water RSL	µg/L	--	--	4.5 U	10 U	**1.7 J**	--	2.2 U	10 U
Iron[3]	7439-89-6	300	MCL	µg/L	--	--	**78**	**962**	**230 K**	--	**40 J**	**318 J**
Lead	7439-92-1	15	MCL	µg/L	--	--	1.5 U	**1.7 B**	2 U	--	1.5 U	**2.7 B**
Magnesium	7439-95-4	--	--	µg/L	--	--	**5600**	**2350**	**2260**	--	**3700**	**6200**
Manganese	7439-96-5	43	Tap Water RSL	µg/L	--	--	**5.8**	**90.2**	**10.2**	--	**3.9 J**	**12.2**
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L	--	--	0.33 U	0.2 U	0.5 U	--	0.33 U	0.2 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L	--	--	**4.2 J**	**30**	**4.3 J**	--	**4.9 J**	20 U
Potassium	7440-09-7	--	--	µg/L	--	--	**1400**	1500 U	**980**	--	**1100**	1500 U
Selenium	7782-49-2	10	Tap Water RSL	µg/L	--	--	**4.1 J**	5 U	**1 J**	--	3.7 U	5 U
Silver	7440-22-4	9.4	Tap Water RSL	µg/L	--	--	1.5 U	5 U	1 U	--	1.5 U	5 U
Sodium	7440-23-5	20000	Health Advisory	µg/L	--	--	**10900**	**9310**	**8680**	--	**11200**	**25300**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L	--	--	0.7 U	1 U	1 U	--	0.7 U	1 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L	--	--	1.5 U	5 U	1 U	--	1.5 U	5 U
Zinc	7440-66-6	600	Tap Water RSL	µg/L	--	--	**6.2**	**17**	**5.2 J**	--	3.8 U	**8.3 B**
Radionuclides												
Radium-226	13982-63-3	0.0004	--	pCi/L	--	--	-0.04 U	--	--	--	-0.04 U	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L	--	--	0.08 U	--	--	--	-0.18 U	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L	--	--	0.05 U	--	--	--	0.03 U	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable. Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

					Location	03MW07S	03MW07S	03MW07S	03MW07S	03MW07S	03MW09O	03MW09O	
					Sample ID	03MW07S-20080319	03MW07S-20081021	03MW07S-20090402	03MW07S-20170522	03MW07S-20190918	03MW09O-20100217	03MW09I-20170522	03MW09I-20170522-D
					Sample Date	3/19/2008	10/21/2008	4/2/2009	5/22/2017	9/18/2019	2/17/2010	5/22/2017	5/22/2017
					Sample Code	N	N	N	N	N	N	N	FD
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**									
Volatile Organic Compounds													
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	1 U	1 U	1 U	0.4 U	**0.42 J**	0.5 U	0.4 U	0.4 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	1 U	1 U	**0.34 J**	1.6 U	0.75 U	0.5 U	1.6 U	1.6 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	**0.53 J**	0.5 U	0.8 U	0.8 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	1 U	1 U	1 U	0.8 U	**0.72 J**	0.5 U	0.8 U	0.8 U
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	2 U	2 U	2 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	2 U	2 U	2 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	7 U	7 U	7 U	1.6 U	2.5 U	0.5 U	1.6 U	1.6 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	--	320 U	--	--	62.5 UJ	--	--	--
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	10 UR	10 UR	10 UR	4 U	3.8 UJ	2.5 UR	4 U	4 U
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	5 U	5 U	5 U	4 U	3.8 U	2.5 U	4 U	4 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	5 U	5 U	5 U	3.2 U	3.8 U	2.5 U	3.2 U	3.2 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	10 UR	10 U	10 UR	6.4 U	3.8 U	3.5 U	6.4 U	6.4 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	**0.13 B**	0.4 U	0.4 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	--	0.2 U	0.2 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 UJ	1.4 UJ	0.8 U	0.8 U
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	1 U	1 U	1 U	1.6 U	0.75 U	0.5 U	1.6 U	1.6 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	1 U	1 U	1 U	1.6 U	0.75 U	0.5 U	1.6 U	1.6 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	1 U	**1.6**	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	2 U	2 U	2 U	4 U	0.75 UJ	0.5 U	4 U	4 U
Methyl Cyclohexane	108-87-2	--	--	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
Methylene Chloride	75-09-2	5	MCL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	**0.12 B**	0.8 U	0.8 U
Styrene	100-42-5	100	MCL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**1.1**	**0.41 J**	**0.74 J**	**0.68 J**	**0.65 J**	**0.35 J**	**2.9**	**2.9**
Toluene	108-88-3	110	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	**0.16 J**	0.4 U	0.4 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	--	--	--	--	2.3 U	0.5 U	--	--
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 UJ	0.5 U	0.4 U	0.4 U
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	1 U	1 U	1 U	0.4 U	0.75 U	0.5 U	0.4 U	0.4 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	1 U	1 U	1 U	0.8 U	0.75 U	0.5 U	0.8 U	0.8 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	1 U	1 U	1 U	0.2 U	0.75 U	0.5 U	0.2 U	0.2 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

Analyte	CASRN	PAL	PAL Reference	Units	Location	03MW07S	03MW07S	03MW07S	03MW07S	03MW07S	03MW09O	03MW09O	
					Sample ID	03MW07S-20080319	03MW07S-20081021	03MW07S-20090402	03MW07S-20170522	03MW07S-20190918	03MW09O-20100217	03MW09I-20170522	03MW09I-20170522-D
					Sample Date	3/19/2008	10/21/2008	4/2/2009	5/22/2017	9/18/2019	2/17/2010	5/22/2017	5/22/2017
					Sample Code	N	N	N	N	N	N	N	FD
Metals (Total)													
Aluminum[3]	7429-90-5	200	MCL	µg/L		**96**	--	--	--	**160**	--	--	--
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L		2 U	--	--	--	1.5 U	--	--	--
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L		6 U	--	--	--	2 U	--	--	--
Barium	7440-39-3	380	Tap Water RSL	µg/L		**625**	--	--	--	**1300**	--	--	--
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	--	--	--
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	--	--	--
Calcium	7440-70-2	--	--	µg/L		**62900**	--	--	--	**123000**	--	--	--
Chromium	7440-47-3	100	MCL	µg/L		**2.2 B**	--	--	--	**2.4**	--	--	--
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L		**0.2 J**	--	--	--	3.7 U	--	--	--
Copper	7440-50-8	80	Tap Water RSL	µg/L		**0.1 B**	--	--	--	2.7 U	--	--	--
Iron[3]	7439-89-6	300	MCL	µg/L		**90**	--	--	--	**97**	--	--	--
Lead	7439-92-1	15	MCL	µg/L		2 U	--	--	--	1.5 U	--	--	--
Magnesium	7439-95-4	--	--	µg/L		**16200**	--	--	--	**37000**	--	--	--
Manganese	7439-96-5	43	Tap Water RSL	µg/L		**12.9**	--	--	--	**13**	--	--	--
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L		0.5 U	--	--	--	0.33 U	--	--	--
Nickel	7440-02-0	39	Tap Water RSL	µg/L		**4.8 J**	--	--	--	**3.9 J**	--	--	--
Potassium	7440-09-7	--	--	µg/L		**1060**	--	--	--	**1300**	--	--	--
Selenium	7782-49-2	10	Tap Water RSL	µg/L		6 U	--	--	--	3.7 U	--	--	--
Silver	7440-22-4	9.4	Tap Water RSL	µg/L		**0.6 B**	--	--	--	1.5 U	--	--	--
Sodium	7440-23-5	20000	Health Advisory	µg/L		**22400**	--	--	--	**46300**	--	--	--
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L		1 U	--	--	--	0.7 U	--	--	--
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L		**0.6 B**	--	--	--	**0.95 J**	--	--	--
Zinc	7440-66-6	600	Tap Water RSL	µg/L		**2.4 J**	--	--	--	3.1 U	--	--	--
Radionuclides													
Radium-226	13982-63-3	0.0004	--	pCi/L		--	--	--	--	0.26 U	--	--	--
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L		--	--	--	--	0 U	--	--	--
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L		--	--	--	--	**0.94**	--	--	--

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable. Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

			Location		03MW09S	03MW09S	03MW09S
			Sample ID		03MW09S-20100217	03MW09S-20170522	03MW09IS-20190918
			Sample Date		2/17/2010	5/22/2017	9/18/2019
			Sample Code		N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**			
Volatile Organic Compounds							
1,1,1-Trichloroethane	71-55-6	200	MCL	µg/L	0.5 U	0.4 U	0.75 U
1,1,2,2-Tetrachloroethane	79-34-5	0.076	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
1,1,2-Trichloroethane	79-00-5	0.041	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
1,1,2-Trichlorotrifluoroethane	76-13-1	1000	Tap Water RSL	µg/L	0.5 U	1.6 U	0.75 U
1,1-Dichloroethane	75-34-3	2.8	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
1,1-Dichloroethene	75-35-4	7	MCL	µg/L	0.5 U	0.8 U	0.75 UJ
1,2,3-Trichlorobenzene	87-61-6	0.7	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
1,2,4-Trichlorobenzene	120-82-1	0.4	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
1,2-Dibromo-3-Chloropropane	96-12-8	0.00033	Tap Water RSL	µg/L	0.5 U	1.6 U	2.5 U
1,2-Dibromoethane	106-93-4	0.0075	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
1,2-Dichlorobenzene	95-50-1	30	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
1,2-Dichloroethane	107-06-2	0.17	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
1,2-Dichloropropane	78-87-5	0.14	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
1,3-Dichlorobenzene[1]	541-73-1	0.48	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
1,4-Dichlorobenzene	106-46-7	0.48	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
1,4-Dioxane	123-91-1	0.46	Tap Water RSL	µg/L	--	--	62.5 UJ
2-Butanone	78-93-3	560	Tap Water RSL	µg/L	2.5 UR	4 U	3.8 UJ
2-Hexanone	591-78-6	3.8	Tap Water RSL	µg/L	2.5 U	4 U	3.8 U
4-Methyl-2-Pentanone	108-10-1	630	Tap Water RSL	µg/L	2.5 U	3.2 U	3.8 U
Acetone	67-64-1	1400	Tap Water RSL	µg/L	3.5 U	6.4 U	3.8 U
Benzene	71-43-2	0.46	Tap Water RSL	µg/L	**0.1 B**	0.4 U	0.75 U
Bromochloromethane	74-97-5	8.3	Tap Water RSL	µg/L	--	0.2 U	0.75 U
Bromodichloromethane	75-27-4	0.13	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Bromoform	75-25-2	3.3	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Bromomethane	74-83-9	0.75	Tap Water RSL	µg/L	1.4 UJ	0.8 U	0.75 UJ
Carbon Disulfide	75-15-0	81	Tap Water RSL	µg/L	0.5 U	1.6 U	0.75 U
Carbon Tetrachloride	56-23-5	0.46	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Chlorobenzene	108-90-7	7.8	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Chloroethane	75-00-3	2100	Tap Water RSL	µg/L	0.5 U	1.6 U	0.75 U
Chloroform	67-66-3	0.22	Tap Water RSL	µg/L	**0.42 J**	0.4 U	0.75 U
Chloromethane	74-87-3	19	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
Cis-1,2-Dichloroethene	156-59-2	3.6	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Cis-1,3-Dichloropropene[2]	10061-01-5	0.47	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Cyclohexane	110-82-7	1300	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
Dibromochloromethane	124-48-1	0.87	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Dichlorodifluoromethane	75-71-8	20	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
Ethylbenzene	100-41-4	1.5	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Isopropylbenzene	98-82-8	45	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Methyl Acetate	79-20-9	2000	Tap Water RSL	µg/L	0.5 U	4 U	0.75 UJ
Methyl Cyclohexane	108-87-2	--	--	µg/L	0.5 U	0.8 U	0.75 U
Methyl Tert-Butyl Ether	1634-04-4	14	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
Methylene Chloride	75-09-2	5	MCL	µg/L	**0.13 B**	0.8 U	0.75 U
Styrene	100-42-5	100	MCL	µg/L	0.5 U	0.4 U	0.75 U
Tetrachloroethene	127-18-4	4.1	MCL	µg/L	**6.8**	**0.45 J**	**3.8**
Toluene	108-88-3	110	Tap Water RSL	µg/L	0.5 U	**0.19 J**	0.75 U
Total Xylenes	1330-20-7	19	Tap Water RSL	µg/L	0.5 U	--	2.3 U
Trans-1,2-Dichloroethene	156-60-5	36	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 UJ
Cis-1,3-Dichloropropene[2]	10061-02-6	0.47	Tap Water RSL	µg/L	0.5 U	0.4 U	0.75 U
Trichloroethene	79-01-6	0.28	Tap Water RSL	µg/L	**0.11 J**	0.4 U	0.75 U
Trichlorofluoromethane	75-69-4	520	Tap Water RSL	µg/L	0.5 U	0.8 U	0.75 U
Vinyl Chloride	75-01-4	0.019	Tap Water RSL	µg/L	0.5 U	0.2 U	0.75 U

Table 5-5: Site 3 Historical Groundwater Results Compared to Project Action Limits

					Location	03MW09S	03MW09S	03MW09S
					Sample ID	03MW09S-20100217	03MW09S-20170522	03MW09IS-20190918
					Sample Date	2/17/2010	5/22/2017	9/18/2019
					Sample Code	N	N	N
Analyte	**CASRN**	**PAL**	**PAL Reference**	**Units**				
Metals (Total)								
Aluminum[3]	7429-90-5	200	MCL	µg/L		--	--	**200**
Antimony	7440-36-0	0.78	Tap Water RSL	µg/L		--	--	1.5 U
Arsenic	7440-38-2	0.052	Tap Water RSL	µg/L		--	--	2 U
Barium	7440-39-3	380	Tap Water RSL	µg/L		--	--	**200**
Beryllium	7440-41-7	2.5	Tap Water RSL	µg/L		--	--	0.7 U
Cadmium	7440-43-9	0.92	Tap Water RSL	µg/L		--	--	0.7 U
Calcium	7440-70-2	--	--	µg/L		--	--	**24000**
Chromium	7440-47-3	100	MCL	µg/L		--	--	**5.3**
Cobalt	7440-48-4	0.6	Tap Water RSL	µg/L		--	--	3.7 U
Copper	7440-50-8	80	Tap Water RSL	µg/L		--	--	**26**
Iron[3]	7439-89-6	300	MCL	µg/L		--	--	**200**
Lead	7439-92-1	15	MCL	µg/L		--	--	1.5 U
Magnesium	7439-95-4	--	--	µg/L		--	--	**7600**
Manganese	7439-96-5	43	Tap Water RSL	µg/L		--	--	**12**
Mercury	7439-97-6	0.063	Tap Water RSL	µg/L		--	--	0.33 U
Nickel	7440-02-0	39	Tap Water RSL	µg/L		--	--	**3.8 J**
Potassium	7440-09-7	--	--	µg/L		--	--	**880**
Selenium	7782-49-2	10	Tap Water RSL	µg/L		--	--	**2 J**
Silver	7440-22-4	9.4	Tap Water RSL	µg/L		--	--	1.5 U
Sodium	7440-23-5	20000	Health Advisory	µg/L		--	--	**11500**
Thallium	7440-28-0	0.02	Tap Water RSL	µg/L		--	--	0.7 U
Vanadium	7440-62-2	8.6	Tap Water RSL	µg/L		--	--	**0.93 J**
Zinc	7440-66-6	600	Tap Water RSL	µg/L		--	--	4.5 U
Radionuclides								
Radium-226	13982-63-3	0.0004	--	pCi/L		--	--	0.21 U
Strontium-90	10098-97-2	0.065	Tap Water RSL	pCi/L		--	--	0.05 U
Uranium-238	7440-61-1	0.00039	Tap Water RSL	pCi/L		--	--	**0.134**

Data Qualifiers:
B = Analyte found in the associated blank.
J = Value is an estimated value between the MDL and the PQL for the analyte.
J+ = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential positive bias.
J- = Value is an estimated value between the MDL and the PQL for the analyte and may have a potential negative bias.
K = Value is reported with an unknown bias.
L = Value is biased low.
U = Value is a non-detected result as reported by the laboratory.
UJ = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is approximate.
UL = Value is a non-detected result as reported by the laboratory. The reported quantitation limit is biased low.
UR = Value is a non-detected result as reported by the laboratory. QC indicates that data are not usable. Resampling and re-analysis are necessary for verification.

Notes:
Concentrations detected above the MDL are shown with bold face.
Gray-shaded results indicate concentrations detected above the indicated PAL.
MDL = Method detection limit.
PQL = Practical quantitation limit.
CASRN = Chemical Abstracts Service Registry Number.
PAL = Project Action Limit.
Tap Water RSL = Tap Water Regional Screening Level (USEPA, 2017).
MCL = Maximum Contaminant Level (USEPA, 2018).
Health Advisory = Drinking Water Health Advisory Level (USEPA, 2018).
USEPA = United States Environmental Protection Agency.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
N = Normal sample.
FD = Field duplicate sample.
-- = Not analyzed/not calculated.
1 = The value for 1,4-dichlorobenzene was used for 1,3-dichlorobenzene.
2 = The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.
3 = Secondary MCLs are presented for aluminum and iron.

FIGURES

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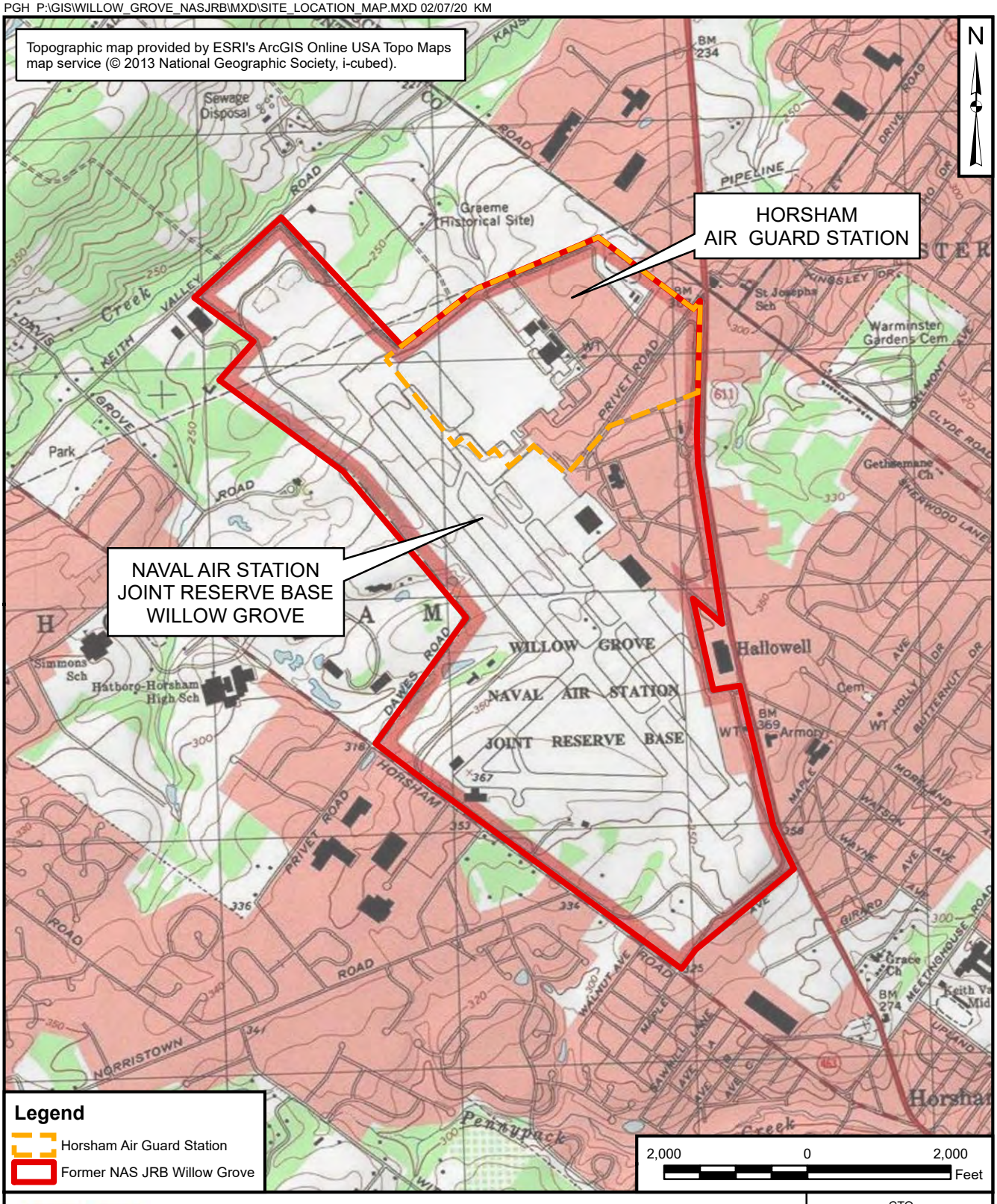

NAVFAC

BASE LOCATION MAP
NAS JRB WILLOW GROVE
HORSHAM, PENNSYLVANIA

CTO	
WE04	
DRAWN BY	DATE
K. MOORE	01/20/20
CHECKED BY	DATE
D. LIPIK	02/07/20
FIGURE NUMBER	
2-1	

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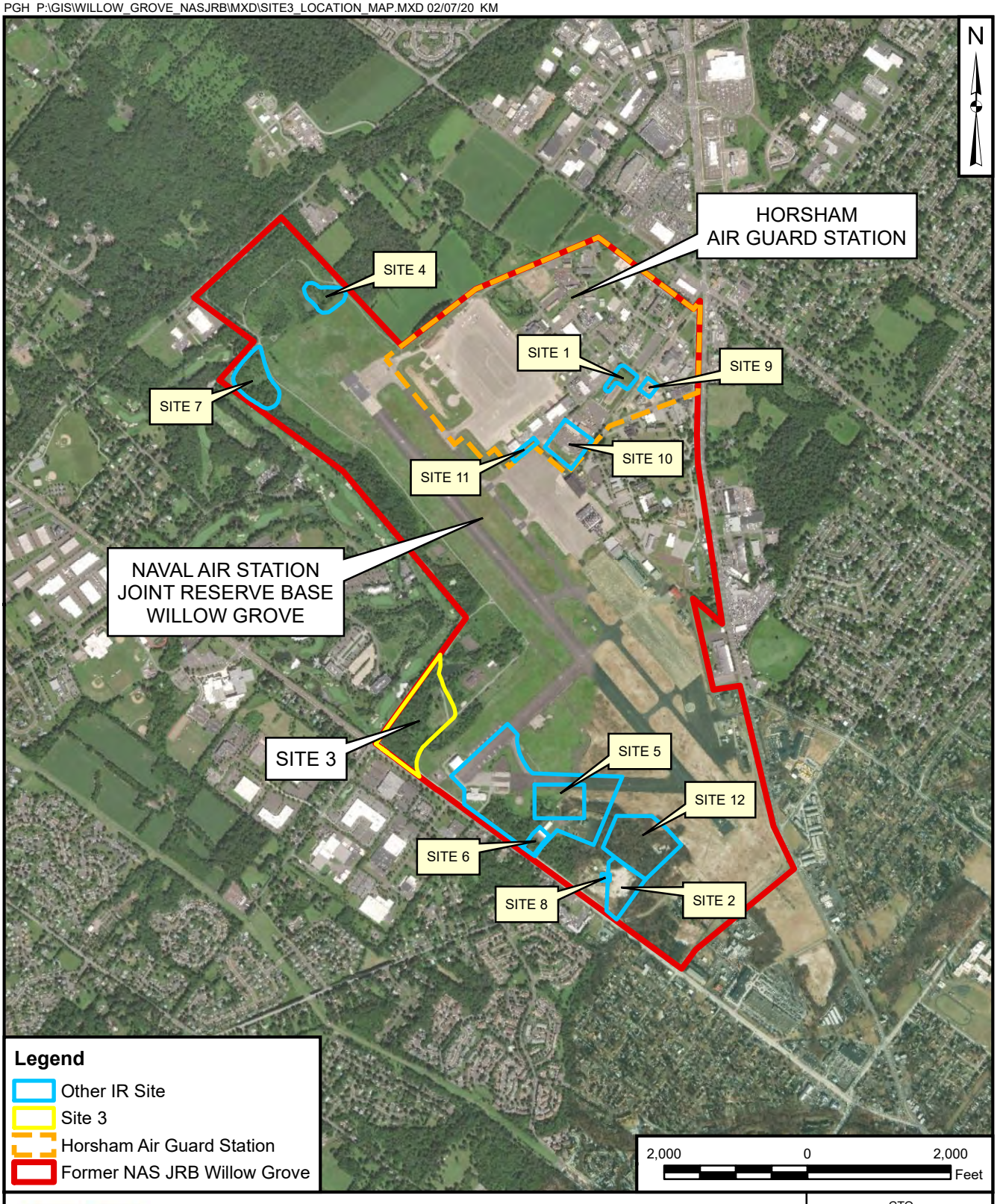

NAVFAC

SITE 3 LOCATION MAP
NAS JRB WILLOW GROVE
HORSHAM, PENNSYLVANIA

CTO	
WE04	
DRAWN BY	DATE
K. MOORE	01/20/20
CHECKED BY	DATE
D. LIPIK	02/07/20
FIGURE NUMBER	
2-2	

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N

03MW02SI
03MW02I
03MW02S
03MW03S
03MW03I
03MW03SI
03MW09S
03MW09O
LOT-1 IRRIGATION WELL
03MW04I
03MW04S
03MW04SI
03MW01S
03MW01SI
03MW01I
03MW05S
03MW05I
03MW07S
03MW06S
03MW06I
03MW06SI
03MW08S
03MW08D

300 0 300 Feet

Legend

- On-site Monitoring Well Location
- Off Base Well Location
- Site Boundary

NAVFAC

SITE 3 WELL LOCATIONS
SITE 3 - NINTH STREET LANDFILL
NAS JRB WILLOW GROVE
HORSHAM, PENNSYLVANIA

CTO	
WE04	
DRAWN BY	DATE
K. MOORE	01/23/20
CHECKED BY	DATE
D. LIPIK	01/23/20
FIGURE NUMBER	
3-1	

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N

LOT 1 IRRIGATION WELL

03MW03S
307.62
03MW03I
03MW03SI

306.98
03MW09S
03MW09O
DRY

03MW04I
03MW04S
311.22
03MW04SI

03MW02SI
03MW02I
03MW02S
314.55

03MW01S
03MW01SI
03MW01I

312.20
03MW07S

03MW05S
03MW05I

332.31
03MW06S
03MW06I
03MW06SI
335.80*

03MW08S
03MW08D

308 310 312 314 316 318 320 322 324 326 328 330 332

200 0 200 Feet

Legend

- On-site Monitoring Well Location
- Off Base Well Location
- 332.31 Groundwater Elevation (ft amsl)
- Potentiometric Contour
- Groundwater Flow Direction
- Site Boundary

Notes:
Groundwater elevation data presented from gauging activities conducted on 9/16/2019.
Contour interval of 2 feet.
ft amsl = Feet above mean sea level (NAVD 88).
* = Groundwater elevation not used in contouring.
DRY = Well was gauged and found to be dry.

NAVFAC

UNCONFINED BEDROCK GROUNDWATER POTENTIOMETRIC SURFACE MAP SEPTEMBER 2019 SITE 3 - NINTH STREET LANDFILL NAS JRB WILLOW GROVE HORSHAM, PENNSYLVANIA

CTO	
WE04	
DRAWN BY	DATE
K. MOORE	01/17/20
CHECKED BY	DATE
D. LIPIK	02/04/20
FIGURE NUMBER	
3-2	

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PGH P:\GIS\WILLOW_GROVE_NASJRB\MXD\SITE03_INTERMEDIATE_BEDROCK_GW_SEPT2019.MXD 2/5/2020 MKB

N

03MW02S
03MW02SI 313.46
03MW02I

03MW03S
03MW03I
03MW03SI
318.10

03MW09S
03MW09O

LOT 1 IRRIGATION WELL

03MW04I
03MW04S
319.78
03MW04SI

03MW01S
03MW01SI
03MW01I

03MW07S

03MW05S
03MW05I

03MW06S
03MW06I
03MW06SI

314
316
318
319

200 0 200
Feet

Legend

- On-site Monitoring Well Location
- Off Base Well Location
- 319.78 Groundwater Elevation (ft amsl)
- Potentiometric Contour
- Groundwater Flow Direction
- Site Boundary

Notes:
Groundwater elevation data presented from gauging activities conducted on 9/16/2019.
Contour interval of 2 feet, unless otherwise indicated.
ft amsl = Feet above mean sea level (NAVD 88).

NAVFAC

INTERMEDIATE CONFINED BEDROCK GROUNDWATER POTENTIOMETRIC SURFACE MAP SEPTEMBER 2019 SITE 3 - NINTH STREET LANDFILL NAS JRB WILLOW GROVE HORSHAM, PENNSYLVANIA

CTO	
WE04	
DRAWN BY	DATE
K. MOORE	01/24/20
CHECKED BY	DATE
D. LIPIK	02/04/20
FIGURE NUMBER	
3-3	

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PGH P:\GIS\WILLOW_GROVE_NASJRB\MXD\SITE03_DEEP_BEDROCK_GW_SEPT2019.MXD 2/5/2020 MKB

N

03MW02S
03MW02SI
03MW02I
320.38

03MW03S
03MW03SI
03MW03I
319.34

320
322
324
326
328

LOT 1 IRRIGATION WELL

03MW09O
03MW09S

328.64* 03MW04I
03MW04S
03MW04SI

03MW01S
03MW01SI
03MW01I

03MW05S
03MW05I

03MW07S

03MW06S
03MW06I
03MW06SI

200 0 200 Feet

Legend

- On-site Monitoring Well Location
- Off Base Well Location
- 319.34 Groundwater Elevation (ft amsl)
- Potentiometric Contour
- Site Boundary
- Groundwater Flow Direction

Notes:
Groundwater elevation data presented from gauging activities conducted on 9/16/2019.
Contour interval of 2 feet.
ft amsl = Feet above mean sea level (NAVD 88).
* = Groundwater elevation is approximated due to artesian flow conditions.

NAVFAC

DEEP CONFINED BEDROCK GROUNDWATER POTENTIOMETRIC SURFACE MAP SEPTEMBER 2019 SITE 3 - NINTH STREET LANDFILL NAS JRB WILLOW GROVE HORSHAM, PENNSYLVANIA

CTO	
WE04	
DRAWN BY	DATE
K. MOORE	01/24/20
CHECKED BY	DATE
D. LIPIK	02/04/20
FIGURE NUMBER	
3-4	

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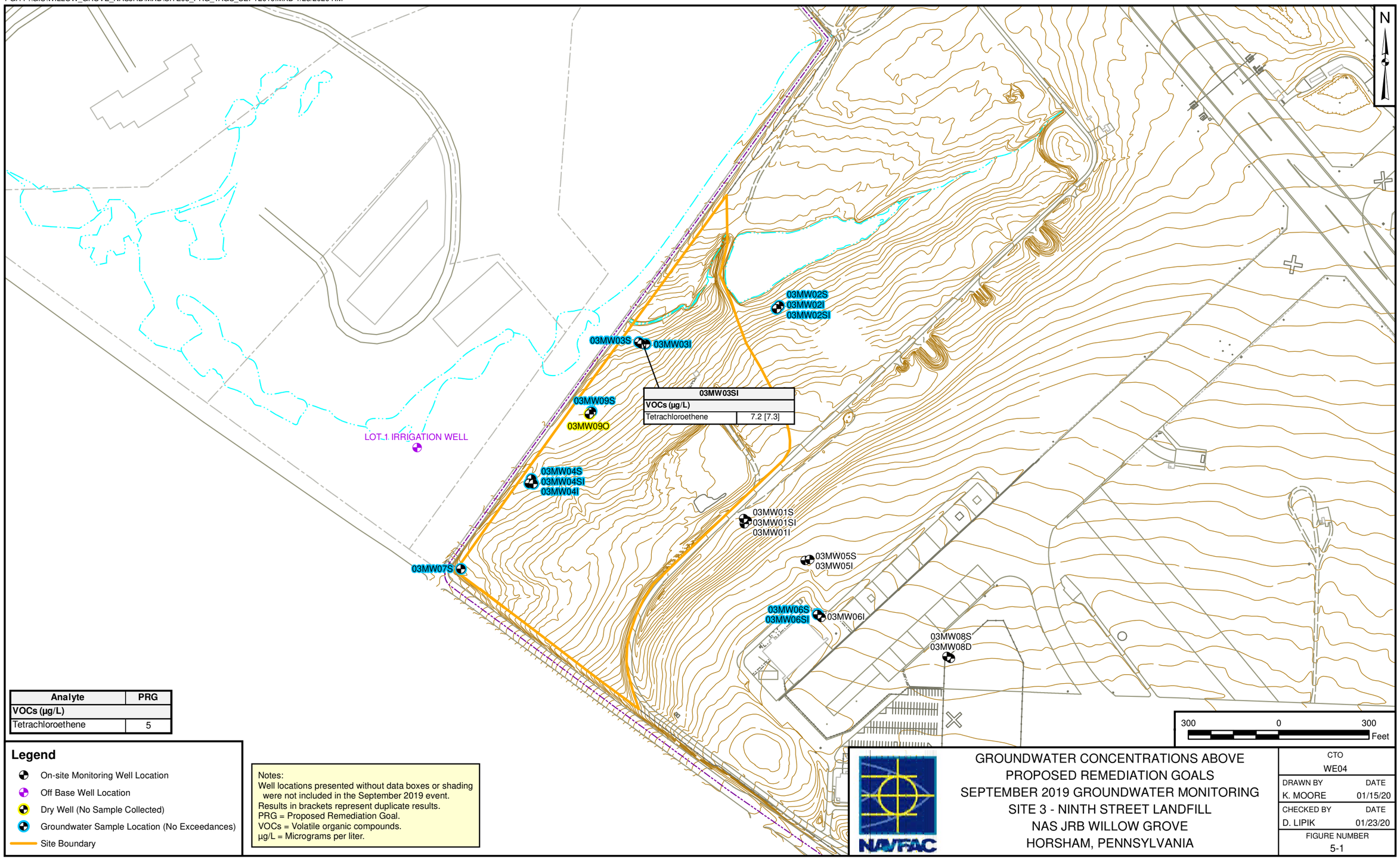

Analyte	PRG
VOCs (µg/L)	
Tetrachloroethene	5

Legend

- On-site Monitoring Well Location
- Off Base Well Location
- Dry Well (No Sample Collected)
- Groundwater Sample Location (No Exceedances)
- Site Boundary

Notes:
Well locations presented without data boxes or shading were not included in the September 2019 event.
Results in brackets represent duplicate results.
PRG = Proposed Remediation Goal.
VOCs = Volatile organic compounds.
µg/L = Micrograms per liter.

NAVFAC

GROUNDWATER CONCENTRATIONS ABOVE PROPOSED REMEDIATION GOALS SEPTEMBER 2019 GROUNDWATER MONITORING SITE 3 - NINTH STREET LANDFILL NAS JRB WILLOW GROVE HORSHAM, PENNSYLVANIA

CTO	WE04
DRAWN BY	K. MOORE
DATE	01/15/20
CHECKED BY	D. LIPIK
DATE	01/23/20
FIGURE NUMBER	5-1

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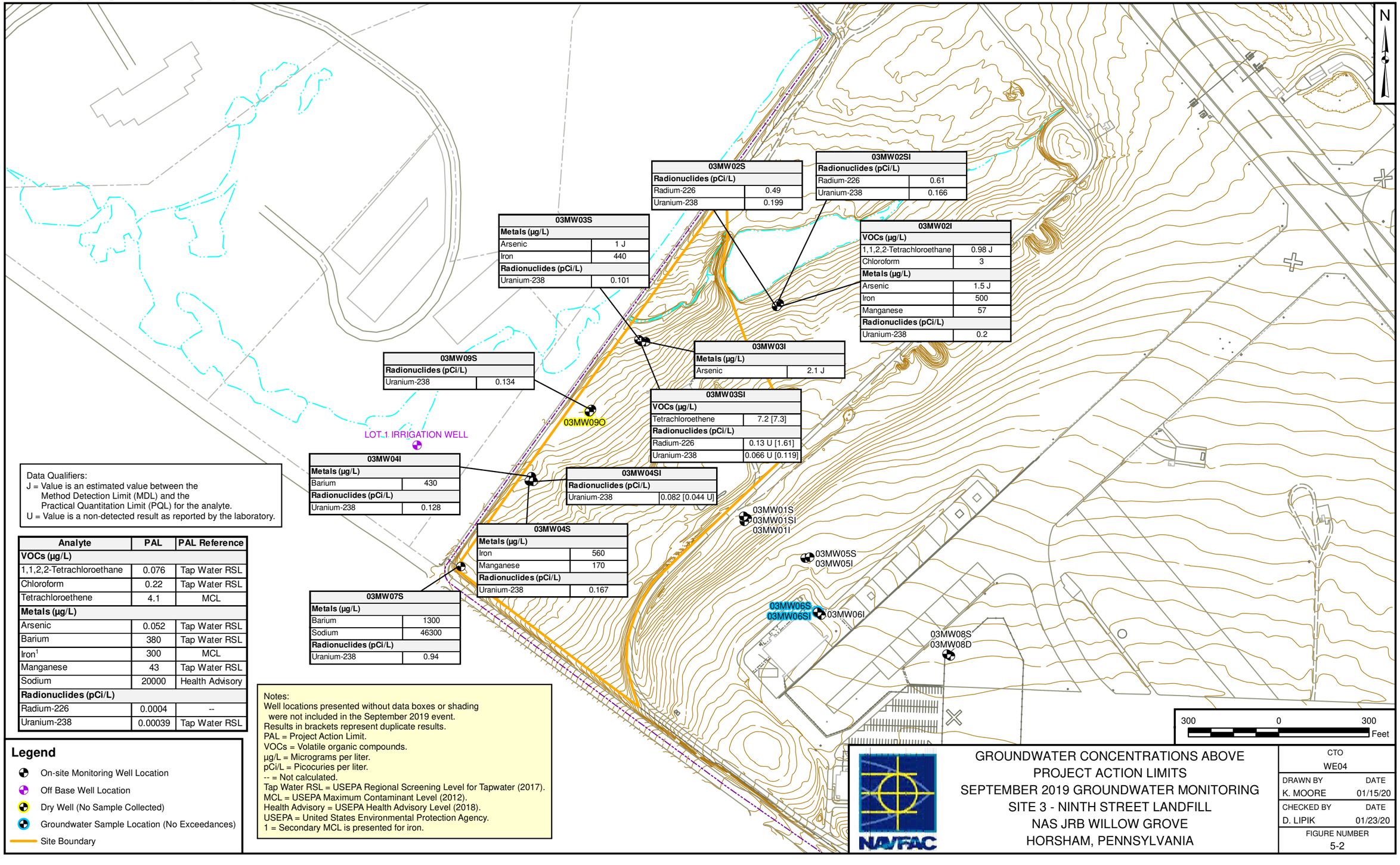

Data Qualifiers:
J = Value is an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
U = Value is a non-detected result as reported by the laboratory.

Analyte	PAL	PAL Reference
VOCs (µg/L)		
1,1,2,2-Tetrachloroethane	0.076	Tap Water RSL
Chloroform	0.22	Tap Water RSL
Tetrachloroethene	4.1	MCL
Metals (µg/L)		
Arsenic	0.052	Tap Water RSL
Barium	380	Tap Water RSL
Iron[1]	300	MCL
Manganese	43	Tap Water RSL
Sodium	20000	Health Advisory
Radionuclides (pCi/L)		
Radium-226	0.0004	--
Uranium-238	0.00039	Tap Water RSL

Legend

- On-site Monitoring Well Location
- Off Base Well Location
- Dry Well (No Sample Collected)
- Groundwater Sample Location (No Exceedances)
- Site Boundary

Notes:
Well locations presented without data boxes or shading were not included in the September 2019 event.
Results in brackets represent duplicate results.
PAL = Project Action Limit.
VOCs = Volatile organic compounds.
µg/L = Micrograms per liter.
pCi/L = Picocuries per liter.
-- = Not calculated.
Tap Water RSL = USEPA Regional Screening Level for Tapwater (2017).
MCL = USEPA Maximum Contaminant Level (2012).
Health Advisory = USEPA Health Advisory Level (2018).
USEPA = United States Environmental Protection Agency.
1 = Secondary MCL is presented for iron.

NAVFAC

GROUNDWATER CONCENTRATIONS ABOVE PROJECT ACTION LIMITS SEPTEMBER 2019 GROUNDWATER MONITORING SITE 3 - NINTH STREET LANDFILL NAS JRB WILLOW GROVE HORSHAM, PENNSYLVANIA

CTO	WE04
DRAWN BY	K. MOORE
DATE	01/15/20
CHECKED BY	D. LIPIK
DATE	01/23/20
FIGURE NUMBER	5-2

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APPENDIX A
FIELD LOGS

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Name: Willow Grove Site 3 | Project No.: 112G08005-WE04

Location: Willow Grove, PA | Personnel:

Weather Conditions: | Measuring Device: Solinst W L Indicator

Tidally Influenced: Yes ____ No __X__ | Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
03MW02S	9/16/19	1116			11.57			
03MW02SI	9/16/19	1120			12.87			
03MW02I	9/16/19	1123			6.00			
03MW03S	9/16/19	1149			5.53			
03MW03SI	9/16/19	1540			+3.87'			
03MW03I	9/16/19	1600			+4.35'			
03MW04S	9/16/19	1219			13.73			
03MW04SI	9/16/19	1217			4.30			
03MW04I	9/16/19	1700			>15.1'			
03MW06S	9/16/19	1107			34.69			
03MW06SI	9/16/19	1110			31.06			
03MW07S	9/16/19	1241			12.70			
03MW09S	9/16/19	1201			Dry			TD= 12.05 TOC
03MW090	9/16/19	1204			11.26			

Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.:
Sample Location: 03MW02S
Sampled By:
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-17-19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1430	Visual	Standard	mS/cm	^{0}C	NTU	mg/l	mV	
Method:	clear	5.41	0.103	18.66	1.04	3.20	405	-

PURGE DATA:

Date: 9-17-19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: RediFlo2								
Monitor Reading(ppm):								
Well Casing Diameter & Material Type: 4" PVC		**(See Low Flow Purge Data Sheet)**						
Total Well Depth (TD):								
Static Water Level (WL): 11.70								
One Casing Volume(gal/L):								
Start Purge (hrs): 1345								
End Purge (hrs): 1430								
Total Purge Time (min): 45								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	2
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	-
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

Water clear no odor

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3 **WELL ID.:** 03MW025

PROJECT NUMBER: 112G08005-WE04 **DATE:** 9-17-19

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1345	11.70	340	5.79	0.105		4.76	18.77	427	clear
1350	11.78	340	5.77	0.103	1.32	3.84	18.46	379	
1355	11.78	340	5.71	0.103	1.29	3.56	18.45	384	
1400	11.78	340	5.58	0.103	1.24	3.32	18.34	392	
1405	11.78	340	5.50	0.103	1.19	3.31	18.32	397	
1410	11.78	340	5.45	0.103	1.15	3.29	18.41	399	
1415	11.78	340	5.38	0.103	1.10	3.27	18.48	~~402~~	
1420	11.78	340	5.38	0.103	1.07	3.26	18.50	404	
1425	11.78	340	5.40	0.103	1.05	3.22	18.64	406	
1430	11.78	340	5.41	0.103	1.04	3.20	18.66	405	

SIGNATURE(S): David Wilson **PAGE___OF**

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GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW025F-20190917
Sample Location: 03MW025F
Sampled By: RW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-17-19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1615	Visual	Standard	mS/cm	^{0}C	NTU	mg/l	mV	
Method: RediFlo2	clear	6.84	0.203	15.53	0.25	4.63	280	—

PURGE DATA:

Date: 9-17-19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: RediFlo2								
Monitor Reading(ppm):								
Well Casing Diameter & Material								
Type: 2" PVC		(See Low Flow Purge Data Sheet)						
Total Well Depth (TD):								
Static Water Level (WL): 12.81								
One Casing Volume(gal/L):								
Start Purge (hrs): 1520								
End Purge (hrs): 1615								
Total Purge Time (min): 55								
Total Vol. Purged (gal/L): 5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	2
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	—
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

Water clear with no odor

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3
PROJECT NUMBER: 112G08005-WE04
WELL ID.: 03MW025I
DATE: 9-17-19

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1520	12.81	320	6.29	0.196	35.6	10.54	15.94	31	cloudy
1525	12.95	320	6.60	0.201	18.1	6.24	15.68	151	
1530	12.95	320	6.69	0.203	9.45	5.67	15.66	213	clear
1535	12.96	320	6.75	0.203	2.70	5.35	15.70	232	
1540	12.97	320	6.78	0.204	1.30	5.23	15.63	245	
1545	12.97	320	6.79	0.204	1.03	5.08	15.69	254	
1550	12.97	320	6.80	0.203	0.75	4.99	15.61	259	
1555	12.97	320	6.81	0.203	0.62	4.91	15.62	265	
1600	12.97	320	6.81	0.204	0.55	4.85	15.51	267	
1605	12.97	320	6.82	0.203	0.43	4.75	15.53	277	
1610	12.97	320	6.83	0.203	0.31	4.68	15.55	281	
1615	12.97	320	6.84	0.203	0.25	4.63	15.53	280	

SIGNATURE(S): David Wheeler

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Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW02I-20190917
Sample Location: 03MW02I
Sampled By:
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/17/19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1445	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Method: Low Flow	clear	5.35	0.234	16.81	3.28	5.69	92	

PURGE DATA:

Date: 9/17/19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Low Flow								
Monitor Reading(ppm): 0.0								
Well Casing Diameter & Material								
Type: 2" PVC		(See Low Flow Purge Data Sheet)						
Total Well Depth (TD):								
Static Water Level (WL): 6.01								
One Casing Volume(gal/L):								
Start Purge (hrs): 1340								
End Purge (hrs): 1440								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 4.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	2
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	—
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

water clear with no odor

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3
PROJECT NUMBER: 112G08005-WE04
WELL ID.: 03MW02I-20190917
DATE: 9/17/19

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1340	6.01	200	4.95	0.222	91.7	4.12	19.10	39	
1345	6.10	200	4.73	0.222	50.2	3.74	18.89	58	
1350	6.10	200	4.98	0.224	29.6	4.43	18.49	85	
1355	6.10	200	5.19	0.225	25.4	4.87	18.24	92	
1400	6.10	200	5.40	0.226	19.1	5.20	18.07	100	
1405	6.10	200	5.43	0.226	14.3	5.32	18.04	101	
1410	6.10	200	5.37	0.227	10.9	5.40	17.89	104	
1415	6.10	200	5.34	0.227	6.55	5.48	17.77	100	
1420	6.10	200	5.43	0.230	6.11	5.54	17.29	98	
1425	6.10	200	5.45	0.230	5.74	5.65	17.17	95	
1430	6.10	200	5.42	0.231	5.22	5.74	17.05	92	
1435	6.10	200	5.39	0.233	4.06	5.64	16.92	95	
1440	6.10	200	5.38	0.234	3.28	5.69	16.81	92	

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GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW03S-20190916
Sample Location: 03MW03S
Sampled By:
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/16/19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1600	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Method: Low Flow	clear	4.14	0.701	17.52	1.31	0.53	250	—

PURGE DATA:

Date: 9/16/19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Low Flow								
Monitor Reading(ppm):								
Well Casing Diameter & Material								
Type: 2" PVC		**(See Low Flow Purge Data Sheet)**						
Total Well Depth (TD):								
Static Water Level (WL): 5.51								
One Casing Volume(gal/L):								
Start Purge (hrs): 1505								
End Purge (hrs): 1555								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 5.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	2
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	—
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

Water is clear with no oder

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3 **WELL ID.:** 03MW035-20190916

PROJECT NUMBER: 112G08005-WE04 **DATE:** 9/16/18

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1505	5.51	200	3.43	0.192	34.2	5.81	18.64	305	
1510	5.53	200	3.55	0.196	17.8	3.53	18.81	288	
1515	5.54	200	3.79	0.198	10.4	2.14	18.52	272	
1520	5.55	200	3.94	0.199	6.59	1.71	18.33	260	
1525	5.55	200	3.98	0.199	4.41	1.53	18.10	257	
1530	5.55	200	4.02	0.199	3.07	1.28	18.00	255	
1535	5.55	200	4.06	0.200	2.34	1.01	17.84	254	
1540	5.56	200	4.08	0.200	1.76	0.88	17.76	253	
1545	5.55	200	4.11	0.201	1.51	0.70	17.67	252	
1550	5.55	200	4.13	0.201	1.39	0.50	17.38	250	
1555	5.55	200	4.14	0.201	1.31	0.53	17.92	250	

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GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW03SI-20190920
Sample Location: 03MW03SI
Sampled By: DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/20/19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1020	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Method: Low Flow	clear	6.72	0.199	11.98	0.21	6.08	379	—

PURGE DATA:

Date: 9/20/19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Volume Purge	Initial	6.44	0.216	13.73	2.23	6.48	369	—
Monitor Reading(ppm): 0.0	11 gal	6.77	0.204	12.71	1.15	6.12	365	—
Well Casing Diameter & Material	16 gal	6.75	0.200	12.42	0.19	6.11	368	—
Type: 2" ~~Steel~~ PVC	22 gal	6.74	0.199	12.06	0.24	6.13	371	—
Total Well Depth (TD): 64.4'	27 gal	6.75	0.200	12.00	0.18	6.02	376	—
Static Water Level (WL): Artesian	33 gal	6.72	0.199	11.98	0.21	6.08	379	—
One Casing Volume (gal/L): 11								
Start Purge (hrs): 1003								
End Purge (hrs): 1019								
Total Purge Time (min): 16								
Total Vol. Purged (gal/L): 33								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC's	HCl	40 ml VOA Vial	6
Total metals & mercury Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1
Strontium 90	HNO3	1 Liter poly	1

OBSERVATIONS / NOTES:

well was artesian at approximately 2 gpm Water was clear with no odor

Circle if Applicable:

MS/MSD

Duplicate ID No.: 03DUP02-20190920 1200

Signature(s):

TBD: To Be Determined

Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove Site 12
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW03I
Sample Location: 03MW03I
Sampled By: DWICM
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-20-19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1225	Visual	Standard	mS/cm	^{0}C	NTU	mg/l	mV	
Method: RediFlo 2	clear	8.17	0.272	12.91	0.30	5.97	237	

PURGE DATA:

Date: 9-20-19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: RediFlo 2								
Monitor Reading(ppm):								
Well Casing Diameter & Material Type: 4"		**(See Low Flow Purge Data Sheet)**						
Total Well Depth (TD): 168								
Static Water Level (WL): flowing								
One Casing Volume(gal/L): 110								
Start Purge (hrs): 1020								
End Purge (hrs): 1220								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 23								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	3
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	—
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

well was flowing at ~ 1.5 L/min
water had sulfur odor

Circle if Applicable:

MS/MSD | Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 12 **WELL ID.:** 03MW03I

PROJECT NUMBER: 112G08005-WE04 **DATE:** 9-20-19

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1120	0.00	1500	7.72	0.291	0.89	5.72	12.72	2	clear
1125	0.05	1500	7.85	0.290	0.90	5.91	12.75	35	"
1130	0.05	1500	8.04	0.287	0.94	6.04	12.79	73	"
1135	0.05	1500	8.12	0.285	0.74	5.89	12.80	117	"
1140	0.05	1500	8.11	0.276	0.61	6.10	12.80	142	"
1145	0.05	1500	8.11	0.273	0.54	6.17	12.86	179	"
1150	0.05	1500	8.13	0.272	0.45	0.11	12.87	195	"
1155	0.05	1500	8.14	0.271	0.30	6.05	12.89	209	"
1200	0.05	1500	8.14	0.271	0.31	6.06	12.92	217	"
1205	0.05	1500	8.15	0.272	0.28	6.04	12.81	222	"
1210	0.05	1500	8.16	0.271	0.33	6.02	12.85	230	"
1215	0.05	1500	8.16	0.271	0.36	5.99	12.86	233	"
1220	0.05	1500	8.17	0.272	0.30	5.97	12.91	237	"

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Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW04S-20190918
Sample Location: 03MW04S
Sampled By: C M
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/18/19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1240	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Method: Low Flow	clear	6.35	0.305	13.06	3.71	6.44	223	--

PURGE DATA:

Date: 9/18/19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Low Flow								
Monitor Reading(ppm): 0.0								
Well Casing Diameter & Material								
Type: 4" PVC		**(See Low Flow Purge Data Sheet)**						
Total Well Depth (TD): 38.7								
Static Water Level (WL): 13.68	1							
One Casing Volume(gal/L):								
Start Purge (hrs): 1130								
End Purge (hrs): 1240								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 5.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	2
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	N/A
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

Water was clear with no odor

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3 **WELL ID.:** 03MW04S-20140918

PROJECT NUMBER: 112G08005-WE04 **DATE:** 9/18/14

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1130	13.72	200	6.79	0.349	57.9	6.84	17.94	302	
1135	13.95	200	6.15	0.311	36.7	7.24	14.61	267	
1140	13.95	200	6.19	0.309	21.9	7.11	14.18	267	
1145	13.95	200	6.24	0.305	57.4	6.94	14.16	260	
1150	13.95	200	6.28	0.303	41.2	6.71	14.15	255	
1155	13.95	200	6.30	0.301	24.2	6.98	13.23	247	
1200	13.95	200	6.30	0.301	20.7	6.90	13.19	240	
1205	13.95	200	6.30	0.302	17.9	6.79	13.15	236	
1210	13.95	200	6.30	0.302	16.0	6.72	13.12	234	
1215	13.95	200	6.31	0.302	11.5	6.60	13.15	232	
1220	13.95	200	6.32	0.303	9.98	6.54	13.16	229	
1225	13.95	200	6.33	0.302	6.39	6.50	13.09	228	
1230	13.95	200	6.34	0.303	5.01	6.50	13.05	226	
1235	13.95	200	6.35	0.304	4.27	6.48	1305	224	
1240	13.95	200	6.35	0.305	3.71	6.44	13.06	223	

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Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

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Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW04 SI-20190
Sample Location: 03MW04SI
Sampled By: DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Date: 9-18-19	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Time: 1230								
Method: RediFlo2	Clear	6.22	0.295	13.54	0.13	6.89	244	

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 9-18-19								
Method: RediFlo2								
Monitor Reading(ppm): 0.5								
Well Casing Diameter & Material Type: 2"								
Total Well Depth (TD):		(See Low Flow Purge Data Sheet)						
Static Water Level (WL): 4.40								
One Casing Volume(gal/L):								
Start Purge (hrs): 1135								
End Purge (hrs): 1225								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 4.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	6
Total Metals & Mercury	HNO3	125 ml Poly	2
Dissolved Metal & Mercury	HNO3	125 ml Poly	—
Strontium 90	HNO3	1 Liter Poly	2
Uranium 238	HNO3	1 Liter Poly	2
Radium 226	HNO3	1 Liter Poly	2

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
	03DUP01-20190918 (1200)

Signature(s): Donald Welsh

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3 **WELL ID.:** 03MW045I

PROJECT NUMBER: 112G08005-WE04 **DATE:** 9-18-19

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1135	4.40	350	6.07	0.324		10.66	15.10	146	clear
1140	4.41	350	6.31	0.304	0.72	7.75	14.24	165	
1145	4.41	350	6.37	0.301	0.24	7.98	14.03	184	
1150	4.41	350	6.38	0.299	0.21	7.64	13.96	197	
1155	4.41	350	6.35	0.297	0.18	7.52	13.84	214	
1200	4.41	350	6.33	0.296	0.16	7.40	13.75	222	
1205	4.41	350	6.30	0.295	0.15	7.39	13.71	227	
1210	4.41	350	6.28	0.295	0.15	7.26	13.68	233	
1215	4.41	350	6.25	0.295	0.14	7.13	13.64	239	
1220	4.41	350	6.23	0.295	0.13	7.10	13.58	241	
1225	4.41	350	6.22	0.295	0.13	6.99	13.54	244	

SIGNATURE(S): Donald Mahler **PAGE___OF**

Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MWJ04I-20190920
Sample Location: 03MWJ04I
Sampled By: DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Date: 9/20/19	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Time: 1515								
Method: Low Flow	Clear	6.86	0.320	12.30	0.51	5.25	335	—

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 9/20/19								
Method: Volume Purge	Initial	8.09	0.394	13.95	0.85	6.35	267	—
Monitor Reading(ppm): 0.0	55 gal	7.38	0.313	13.04	0.29	5.99	302	—
Well Casing Diameter & Material	110 gal	7.00	0.318	12.54	0.45	5.70	322	—
Type: ~~6"~~ ~~Steel~~ PVC	165 gal	6.91	0.320	12.38	0.34	5.28	327	—
Total Well Depth (TD): 168'	220 gal	6.89	0.320	12.34	0.50	5.31	331	—
Static Water Level (WL): Artesian	270 gal	6.86	0.320	12.30	0.51	5.25	335	—
One Casing Volume (gal/L): 110								
Start Purge (hrs): 1400								
End Purge (hrs): 1510								
Total Purge Time (min): 70								
Total Vol. Purged (gal/L): 270								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC's	HCl	40 ml VOA Vial	3
Total metals & mercury Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	+
Radium 226	HNO3	1 Liter Poly	1
Strontium 90	HNO3	1 Liter poly	1

OBSERVATIONS / NOTES:

Well is artesian flowing approximately 5 gpm water clear with no odor

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW06S-20190917
Sample Location: 03MW06S
Sampled By:
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9/17/19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1125	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Method: Low Flow								

PURGE DATA:

Date: 9/17/19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Low Flow								
Monitor Reading(ppm): 0.0								
Well Casing Diameter & Material Type: 2" PVC		(See Low Flow Purge Data Sheet)						
Total Well Depth (TD): 38.33								
Static Water Level (WL): 34.71								
One Casing Volume(gal/L):								
Start Purge (hrs): 1030								
End Purge (hrs): 1120								
Total Purge Time (min): 50								
Total Vol. Purged (gal/L): 3.5								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	2
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	—
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

Water clear no odors

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3
PROJECT NUMBER: 112G08005-WE04

WELL ID.: BBMW06S-20190917
DATE: 9/17/19

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1030	34.71	200	5.44	0.155	219	10.17	21.29	375	Light Gray
1035	34.83	200	5.42	0.154	126	9.34	20.16	393	
1040	34.85	200	5.41	0.153	57.1	8.81	20.03	404	
1045	34.90	200	5.40	0.152	27.9	8.56	19.97	417	
1050	34.90	200	5.39	0.150	4.97	8.55	19.39	439	
1055	34.90	200	5.39	0.150	3.43	8.54	18.91	447	
1100	34.90	200	5.38	0.150	2.18	8.54	18.64	451	
1105	34.90	200	5.37	0.150	1.77	8.52	18.50	455	
1110	34.90	200	5.37	0.150	1.40	8.56	18.09	458	
1115	34.90	200	5.36	0.150	1.03	8.53	17.95	459	
1120	34.90	200	5.35	0.150	0.87	8.50	17.89	461	

SIGNATURE(S): _____ **PAGE** 1 **OF** 1

Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW06SI-20190917
Sample Location: 03MW06SI
Sampled By: DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 9-17-19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1120	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Method: Redi Flo 2	clear	3.22	0.156	17.79	0.87	2.17	319	—

PURGE DATA:

Date: 9/17/19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Low Flow								
Monitor Reading(ppm): 0.0								
Well Casing Diameter & Material								
Type: 2" PVC		(See Low Flow Purge Data Sheet)						
Total Well Depth (TD):								
Static Water Level (WL): 31.35								
One Casing Volume(gal/L):								
Start Purge (hrs): 1012								
End Purge (hrs): 1120								
Total Purge Time (min): 68								
Total Vol. Purged (gal/L): 8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	6
Total Metals & Mercury	HNO3	125 ml Poly	3
Dissolved Metal & Mercury	HNO3	125 ml Poly	—
Strontium 90	HNO3	1 Liter Poly	3
Uranium 238	HNO3	1 Liter Poly	3
Radium 226	HNO3	1 Liter Poly	3

OBSERVATIONS / NOTES:

Water was clear no odor

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3 **WELL ID.:** 9-17-19

PROJECT NUMBER: 112G08005-WE04 **DATE:** 03MW065T

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1012	31.35		2.68	0.202		12.28	16.49	339	clear
1015	31.40	400	2.59	0.174	8.46	6.04	16.55	333	
1020	31.40	350	2.66	0.162	6.61	4.22	17.13	332	
1025	31.40	350	2.62	0.161	5.82	3.75	17.24	336	
1030	31.40	350	2.58	0.161	5.17	3.29	17.39	339	
1035	31.40	350	2.62	0.160	3.89	2.69	17.38	338	
1040	31.40	350	2.73	0.158	3.21	3.02	17.61	335	
1045	31.40	350	2.77	0.158	2.77	2.91	17.60	334	
1050	31.40	350	2.85	0.158	2.40	2.37	17.53	331	
1055	31.40	350	2.95	0.157	1.83	2.16	17.70	328	
1100	31.40	350	3.02	0.157	1.59	2.09	17.72	326	
1105	31.40	350	3.08	0.157	1.30	2.02	17.75	324	
1110	31.40	350	3.12	0.157	1.14	2.10	17.75	322	
1115	31.40	350	3.18	0.156	0.98	2.14	17.76	321	
1120	31.40	350	3.22	0.156	0.87	2.17	17.79	319	

SIGNATURE(S): _____ **PAGE** ___ **OF**

Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: 03MW075-20190918
Sample Location: 03MW075
Sampled By: DW
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Date: 9-18-19	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Time: 1500								
Method: RediFlo 2	clear	6.86	1.09	15.28	2.39	4.33	267	

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Date: 9-18-19								
Method: RediFlo 2								
Monitor Reading(ppm):								
Well Casing Diameter & Material Type: 2" PVC		(See Low Flow Purge Data Sheet)						
Total Well Depth (TD):								
Static Water Level (WL): 12.78								
One Casing Volume(gal/L):								
Start Purge (hrs): 1400								
End Purge (hrs): 1500								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 8								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	3
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	—
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3
PROJECT NUMBER: 112G08005-WE04
WELL ID.: 03MW07S
DATE: 9-18-19

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1405	12.78	380	6.48	1.04	191	9.09	14.84	354	lt. Brown cloudy
1410	12.85	380	6.75	1.06	102	5.37	15.00	312	cloudy
1415	12.85	380	6.83	1.07	34.2	5.36	15.23	271	sl. cloudy
1420	12.85	380	6.85	1.07	25.4	5.05	15.00	256	sl. cloudy
1425	12.85	380	6.86	1.08	20.6	4.90	15.11	257	
1430	12.85	380	6.86	1.08	9.45	4.76	15.25	257	clear
1435	12.85	380	6.86	1.08	6.23	4.61	15.28	257	clear
1440	12.85	380	6.86	1.08	4.56	4.53	15.31	257	clear
1445	12.85	380	6.86	1.09	4.04	4.47	15.28	260	"
1450	12.85	380	6.86	1.09	~~4.83~~ 3.16	4.43	15.27	262	"
1455	12.85	380	6.86	1.09	2.60	4.37	15.36	264	"
1500	12.85	380	6.86	1.09	2.39	4.33	15.28	267	"

SIGNATURE(S): David Wheeler

Tetra Tech, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Willow Grove Site 3
Project No.: 112G08005-WE04

Sample ID No.: 03MW09I-20190918
Sample Location: 03MW09I
Sampled By:
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

SAMPLING DATA:

Date: 9/18/19	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	TBD
Time: 1505	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	
Method: Low Flow	clear	6.24	0.221	13.95	4.47	9.10	93	—

PURGE DATA:

Date: 9/18/19	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	ORP	TBD
Method: Low Flow								
Monitor Reading(ppm): 0.5								
Well Casing Diameter & Material								
Type: 2" PVC		**(See Low Flow Purge Data Sheet)**						
Total Well Depth (TD):								
Static Water Level (WL): 11.36								
One Casing Volume(gal/L):								
Start Purge (hrs): 1400								
End Purge (hrs): 1500								
Total Purge Time (min): 60								
Total Vol. Purged (gal/L): 4.0								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TCL VOC	HCL	40ml VOA Vial	2
Total Metals & Mercury	HNO3	125 ml Poly	1
Dissolved Metal & Mercury	HNO3	125 ml Poly	N/A
Strontium 90	HNO3	1 Liter Poly	1
Uranium 238	HNO3	1 Liter Poly	1
Radium 226	HNO3	1 Liter Poly	1

OBSERVATIONS / NOTES:

Water was clear with no odor

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TBD: To Be Determined

Tetra Tech

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: Willow Grove Site 3 **WELL ID.:** 03MW09S-20190918

PROJECT NUMBER: 112G08005-WE04 **DATE:** 9/18/19

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Other Comments
1400	11.36	200	6.67	0.266	439	9.43	13.07	100	Light Gray
1405	11.50	200	6.61	0.257	261	8.10	13.51	115	Light Gray
1410	11.50	200	6.52	0.250	125	6.91	13.79	100	Light Gray
1415	11.50	200	6.47	0.239	50.6	5.47	13.86	89	Light Gray Tint
1420	11.51	200	6.35	0.230	20.1	4.99	14.01	81	Clear
1425	11.51	200	6.32	0.227	12.4	4.73	14.00	86	Clear
1430	11.51	200	6.30	0.225	8.33	4.57	14.02	88	Clear
1435	11.51	200	6.28	0.224	7.27	4.45	13.97	90	Clear
1440	11.51	200	6.27	0.223	6.32	4.37	13.94	92	Clear
1445	11.51	200	6.26	0.222	6.11	4.26	13.96	90	Clear
1450	11.51	200	6.25	0.222	5.36	4.21	13.97	91	Clear
1455	11.51	200	6.24	0.222	4.84	4.17	13.97	92	Clear
1500	11.51	200	6.24	0.221	4.47	4.10	13.95	93	Clear

SIGNATURE(S): _____ **PAGE** 1 **OF** 1

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APPENDIX B
GEOLOGIC TRANSECT FIGURES

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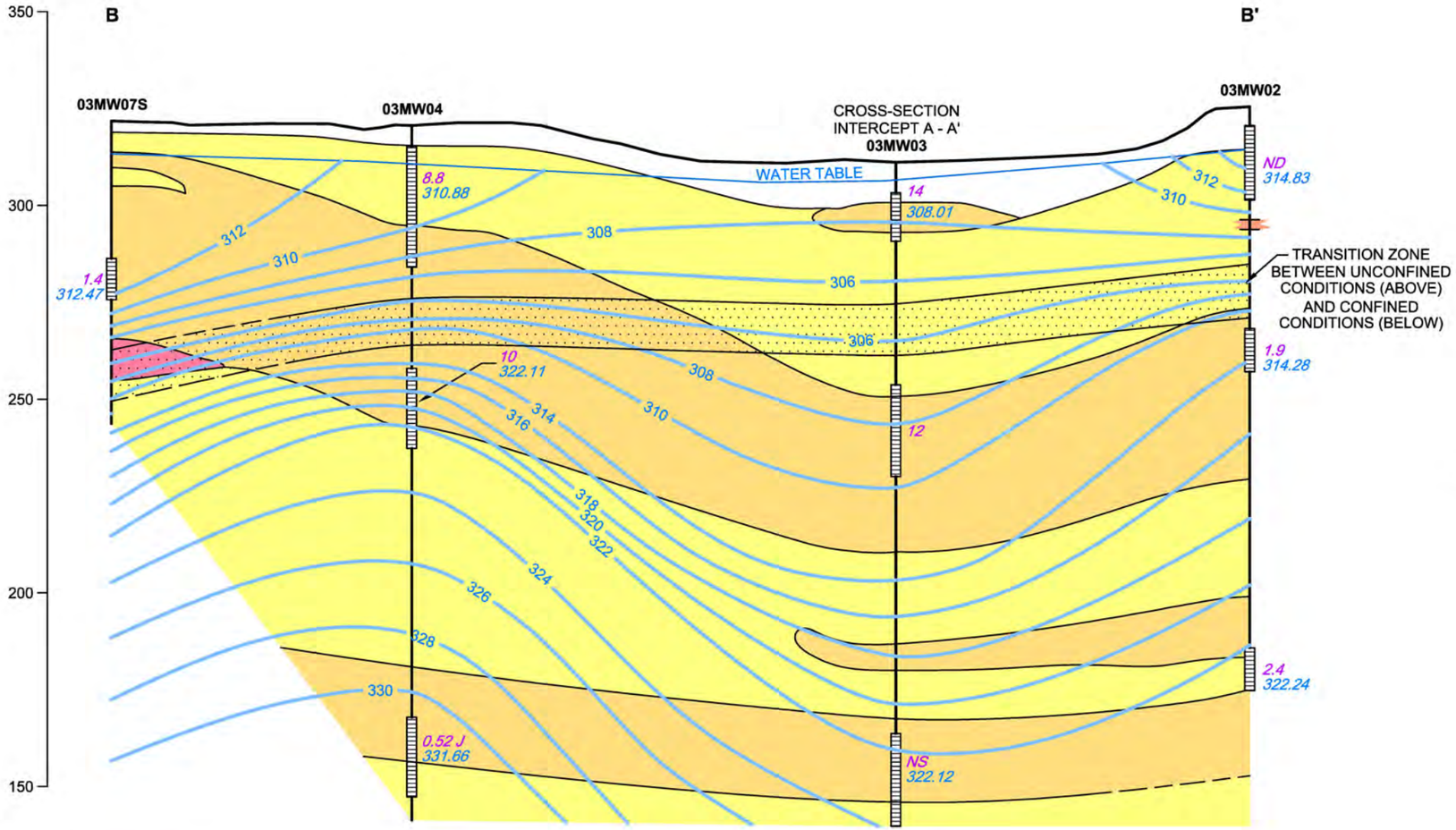
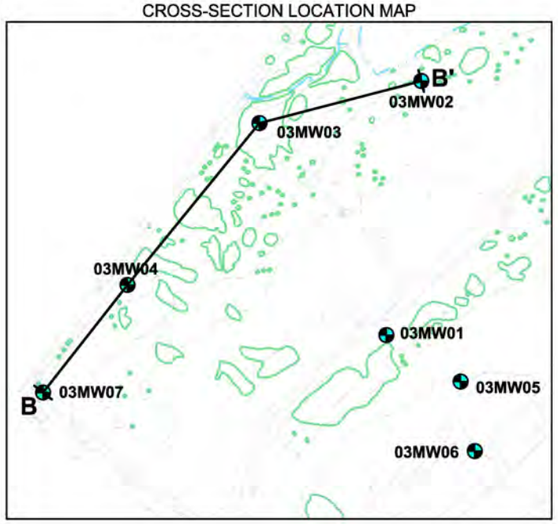
C:\All_Projects\112G08005\WE31\ES.DB\112G08005GS01.dwg MKB 9/2/17



CROSS-SECTION LOCATION MAP



0 140 280
HORIZONTAL SCALE IN FEET

LEGEND

4.9	PCE RESULT (µg/L)
NS	NOT SAMPLED
ND	NON-DETECT
10	GROUNDWATER CONTOUR
310.88	HYDRAULIC HEAD (FT MSL)

NAVFAC

VERTICAL FLOW NET FOR CROSS–SECTION B – B'
AUGUST 1997
SITE 3 – NINTH STREET LANDFILL
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

SCALE	AS NOTED
FILE	112G08005GS01.dwg
REV	0
DATE	9/2/17
FIGURE NUMBER	FIGURE 1–4

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C:\AII Projects\112G08005\WE311ES.DB\112G08005GS01.dwg MKB 9/2/17

A

A'

03MW01

03MW03

03MW05

03MW06

03MW08

LANDFILL

CROSS-SECTION INTERCEPT B - B'

WATER TABLE

350

300

250

200

150

14
308.01

12

NS
322.12

0.90 J
325.69

4.9
323.45

0.23 J
336.69

0.67 J
334.53

0.70 J
334.90

1.3
334.78

ND
337.80

0.79 J
337.58

ND
339.80

0.78 J
338.32

308
310
312
314
316
318
320
322
324
326
328
330
332
334
336
338

TRANSITION ZONE BETWEEN UNCONFINED CONDITIONS (ABOVE) AND CONFINED CONDITIONS (BELOW)

LITHOLOGY

- CLAYSTONE
- SANDSTONE
- CGL. SANDSTONE
- SILTSTONE

CROSS-SECTION LOCATION MAP

LEGEND

4.9	PCE RESULT (µg/L)
NS	NOT SAMPLED
ND	NON-DETECT
10	GROUNDWATER CONTOUR
310.88	HYDRAULIC HEAD (FT MSL)

0 140 280

HORIZONTAL SCALE IN FEET

NAVFAC

HYDROGEOLOGIC CROSS–SECTION A – A'
SHOWING PCE CONCENTRATIONS
SEPTEMBER 2006
SITE 3 – NINTH STREET LANDFILL
NAS JRB WILLOW GROVE
WILLOW GROVE, PENNSYLVANIA

SCALE	AS NOTED
FILE	112G08005GS01.dwg
REV	0
DATE	9/2/17
FIGURE NUMBER	FIGURE 1–5

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APPENDIX C
LABORATORY ANALYTICAL REPORTS
(INCLUDED ON CD ONLY)

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ALS Environmental

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

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

October 22, 2019

Ms. Tricia Moore
Tetra Tech Inc

Certificate of Analysis

Project Name:	**Form Naval Air Station JRB/Willow Grove**	Workorder:	**3058771**
Purchase Order:		Workorder ID:	**EPR029|Willow Grove Sites 3 an**

Dear Ms. Moore:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, September 18, 2019.

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 Mrs. Vanessa N Badman (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. Amy Thompson , Mr. Rick Carr , Ms. Megan Ritchie

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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

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

SAMPLE SUMMARY

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3058771001	TB-01-20190916	Water	9/18/2019 09:01	9/18/2019 09:01	Collected by Client
3058771002	03MW03S-20190916	Water	9/16/2019 16:00	9/18/2019 09:01	Collected by Client
3058771003	03MW06SI-20190917	Water	9/17/2019 11:20	9/18/2019 09:01	Collected by Client
3058771004	03MW06S-20190917	Water	9/17/2019 11:25	9/18/2019 09:01	Collected by Client
3058771005	03MW02S-20190917	Water	9/17/2019 14:30	9/18/2019 09:01	Collected by Client
3058771006	03MW02I-20190917	Water	9/17/2019 14:45	9/18/2019 09:01	Collected by Client
3058771007	03MW02SI-20190917	Water	9/17/2019 16:15	9/18/2019 09:01	Collected by Client

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SAMPLE SUMMARY

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

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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PROJECT SUMMARY

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Workorder Comments

Please see attached subcontracting from ALS Ft. Collins. VNB 9/19/19

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771001** Date Collected: 9/18/2019 09:01 Matrix: Water

Sample ID: **TB-01-20190916** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 15:29	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 15:29	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/23/19 15:29	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
1,4-Dioxane	100U	U,1	ug/L	125	100	90.0	SW846 8260C		9/23/19 15:29	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 15:29	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 15:29	TMP	A

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ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771001** Date Collected: 9/18/2019 09:01 Matrix: Water

Sample ID: **TB-01-20190916** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/23/19 15:29	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/23/19 15:29	TMP	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 15:29	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118	SW846 8260C			9/23/19 15:29	TMP	A
4-Bromofluorobenzene (S)	114		%	85 - 114	SW846 8260C			9/23/19 15:29	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119	SW846 8260C			9/23/19 15:29	TMP	A
Toluene-d8 (S)	105		%	89 - 112	SW846 8260C			9/23/19 15:29	TMP	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771002** Date Collected: 9/16/2019 16:00 Matrix: Water

Sample ID: **03MW03S-20190916** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 16:59	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 16:59	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/23/19 16:59	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/23/19 16:59	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 16:59	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 16:59	TMP	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771002** Date Collected: 9/16/2019 16:00 Matrix: Water

Sample ID: **03MW03S-20190916** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/23/19 16:59	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
Tetrachloroethene	3.1		ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/23/19 16:59	TMP	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 16:59	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118	SW846 8260C			9/23/19 16:59	TMP	A
4-Bromofluorobenzene (S)	113		%	85 - 114	SW846 8260C			9/23/19 16:59	TMP	A
Dibromofluoromethane (S)	103		%	80 - 119	SW846 8260C			9/23/19 16:59	TMP	A
Toluene-d8 (S)	104		%	89 - 112	SW846 8260C			9/23/19 16:59	TMP	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Arsenic, Total	0.0010J	J	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:11	LXC	C
Barium, Total	0.16		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Calcium, Total	18.8		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Chromium, Total	0.0010J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Copper, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:11	LXC	C
Iron, Total	0.44		mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:11	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Magnesium, Total	7.1		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Manganese, Total	0.027		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/20/19	AHI	9/20/19 16:15	AHI	C
Nickel, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C

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ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771002** Date Collected: 9/16/2019 16:00 Matrix: Water

Sample ID: **03MW03S-20190916** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	1.0		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:11	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Sodium, Total	8.9		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Vanadium, Total	0.0013J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:09	LXC	C
Zinc, Total	0.0043J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:11	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/16/19 16:00	SUB	D

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771003** Date Collected: 9/17/2019 11:20 Matrix: Water

Sample ID: **03MW06SI-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 17:22	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 17:22	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/23/19 17:22	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,1-Dichloroethene	0.75U	U,6,7	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
trans-1,2-Dichloroethene	0.75U	U,8	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
1,4-Dioxane	62.5U	U,2,3,4,5	ug/L	125	62.5	41.6	SW846 8260C		9/23/19 17:22	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 17:22	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:22	TMP	A

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ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771003** Date Collected: 9/17/2019 11:20 Matrix: Water

Sample ID: **03MW06SI-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/23/19 17:22	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/23/19 17:22	TMP	A
1,2,3-Trichlorobenzene	0.75U	U,1	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:22	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C			9/23/19 17:22	TMP	A
4-Bromofluorobenzene (S)	111		%	85 - 114			SW846 8260C			9/23/19 17:22	TMP	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			9/23/19 17:22	TMP	A
Toluene-d8 (S)	102		%	89 - 112			SW846 8260C			9/23/19 17:22	TMP	A
METALS												
Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:14	LXC	G
Barium, Total	0.11		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Calcium, Total	10.7		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Chromium, Total	0.0047		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Copper, Total	0.0022J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:14	LXC	G
Iron, Total	0.040J	J	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:14	LXC	G
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Magnesium, Total	3.7		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Manganese, Total	0.0039J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771003** Date Collected: 9/17/2019 11:20 Matrix: Water

Sample ID: **03MW06SI-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Mercury, Total	0.00033U	U,9	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/20/19	AHI	9/20/19 16:19	AHI	G
Nickel, Total	0.0049J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Potassium, Total	1.1		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:14	LXC	G
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Sodium, Total	11.2		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Vanadium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:13	LXC	G
Zinc, Total	0.0038J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:14	LXC	G
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/17/19 11:20	SUB	J

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771004** Date Collected: 9/17/2019 11:25 Matrix: Water

Sample ID: **03MW06S-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 17:45	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 17:45	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/23/19 17:45	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/23/19 17:45	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/23/19 17:45	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/23/19 17:45	TMP	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771004** Date Collected: 9/17/2019 11:25 Matrix: Water

Sample ID: **03MW06S-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/23/19 17:45	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
Tetrachloroethene	0.47J	J	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/23/19 17:45	TMP	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/23/19 17:45	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C			9/23/19 17:45	TMP	A
4-Bromofluorobenzene (S)	115	2	%	85 - 114			SW846 8260C			9/23/19 17:45	TMP	A
Dibromofluoromethane (S)	105		%	80 - 119			SW846 8260C			9/23/19 17:45	TMP	A
Toluene-d8 (S)	105		%	89 - 112			SW846 8260C			9/23/19 17:45	TMP	A
METALS												
Aluminum, Total	0.047J	J	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:24	LXC	C
Barium, Total	0.036		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Calcium, Total	10.4		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Chromium, Total	0.0040		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Copper, Total	0.0045J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:24	LXC	C
Iron, Total	0.078		mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:24	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Magnesium, Total	5.6		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Manganese, Total	0.0058		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/20/19	AHI	9/20/19 16:23	AHI	C
Nickel, Total	0.0042J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771004** Date Collected: 9/17/2019 11:25 Matrix: Water

Sample ID: **03MW06S-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Potassium, Total	1.4		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Selenium, Total	0.0041J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:24	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Sodium, Total	10.9		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Vanadium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:22	LXC	C
Zinc, Total	0.0062		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:24	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/17/19 11:25	SUB	D

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771005** Date Collected: 9/17/2019 14:30 Matrix: Water

Sample ID: **03MW02S-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.5J	J	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 03:29	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 03:29	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/26/19 03:29	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/26/19 03:29	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 03:29	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:29	PDK	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771005** Date Collected: 9/17/2019 14:30 Matrix: Water

Sample ID: **03MW02S-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/26/19 03:29	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
Tetrachloroethene	1.2		ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/26/19 03:29	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:29	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118	SW846 8260C			9/26/19 03:29	PDK	A
4-Bromofluorobenzene (S)	115	2	%	85 - 114	SW846 8260C			9/26/19 03:29	PDK	A
Dibromofluoromethane (S)	103		%	80 - 119	SW846 8260C			9/26/19 03:29	PDK	A
Toluene-d8 (S)	105		%	89 - 112	SW846 8260C			9/26/19 03:29	PDK	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:27	LXC	C
Barium, Total	0.10		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Calcium, Total	8.5		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Chromium, Total	0.0029		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Copper, Total	0.0028J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:27	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:27	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Magnesium, Total	3.9		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/20/19	AHI	9/20/19 16:24	AHI	C
Nickel, Total	0.0025J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C

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ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771005** Date Collected: 9/17/2019 14:30 Matrix: Water

Sample ID: **03MW02S-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	1.1		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:27	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Sodium, Total	7.6		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Vanadium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:26	LXC	C
Zinc, Total	0.0045J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:27	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/17/19 14:30	SUB	D

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771006** Date Collected: 9/17/2019 14:45 Matrix: Water

Sample ID: **03MW02I-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	7.8		ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 03:52	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 03:52	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Chloroform	3.0		ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/26/19 03:52	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
cis-1,2-Dichloroethene	1.8		ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/26/19 03:52	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Freon 113	0.33J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 03:52	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 03:52	PDK	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771006** Date Collected: 9/17/2019 14:45 Matrix: Water

Sample ID: **03MW02I-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/26/19 03:52	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
1,1,2,2-Tetrachloroethane	0.98J	J	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/26/19 03:52	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 03:52	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118	SW846 8260C			9/26/19 03:52	PDK	A
4-Bromofluorobenzene (S)	114		%	85 - 114	SW846 8260C			9/26/19 03:52	PDK	A
Dibromofluoromethane (S)	104		%	80 - 119	SW846 8260C			9/26/19 03:52	PDK	A
Toluene-d8 (S)	105		%	89 - 112	SW846 8260C			9/26/19 03:52	PDK	A

METALS

Aluminum, Total	0.14		mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Arsenic, Total	0.0015J	J	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:30	LXC	C
Barium, Total	0.32		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:30	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Calcium, Total	22.2		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Chromium, Total	0.0066		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Copper, Total	0.023		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:30	LXC	C
Iron, Total	0.50		mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:30	LXC	C
Lead, Total	0.0018J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Magnesium, Total	10.5		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Manganese, Total	0.057		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/20/19	AHI	9/20/19 16:25	AHI	C
Nickel, Total	0.0050J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771006** Date Collected: 9/17/2019 14:45 Matrix: Water

Sample ID: **03MW02I-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Potassium, Total	0.81		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:30	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Sodium, Total	8.1		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Vanadium, Total	0.0024		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:29	LXC	C
Zinc, Total	0.047		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:30	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/17/19 14:45	SUB	D

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771007** Date Collected: 9/17/2019 16:15 Matrix: Water

Sample ID: **03MW02SI-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 04:14	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 04:14	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/26/19 04:14	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/26/19 04:14	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 04:14	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:14	PDK	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771007** Date Collected: 9/17/2019 16:15 Matrix: Water

Sample ID: **03MW02SI-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/26/19 04:14	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/26/19 04:14	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:14	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	81 - 118	SW846 8260C			9/26/19 04:14	PDK	A
4-Bromofluorobenzene (S)	116	2	%	85 - 114	SW846 8260C			9/26/19 04:14	PDK	A
Dibromofluoromethane (S)	102		%	80 - 119	SW846 8260C			9/26/19 04:14	PDK	A
Toluene-d8 (S)	105		%	89 - 112	SW846 8260C			9/26/19 04:14	PDK	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:33	LXC	C
Barium, Total	0.32		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:33	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Calcium, Total	24.9		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Chromium, Total	0.0022		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Copper, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:33	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:33	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Magnesium, Total	12.8		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/20/19	AHI	9/20/19 16:27	AHI	C
Nickel, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID: **3058771007** Date Collected: 9/17/2019 16:15 Matrix: Water

Sample ID: **03MW02SI-20190917** Date Received: 9/18/2019 09:01

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	0.77		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:33	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Sodium, Total	11.5		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Vanadium, Total	0.0020J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:32	LXC	C
Zinc, Total	0.0023J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:33	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/17/19 16:15	SUB	D

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3058771001	1	TB-01-20190916	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3058771002	1	03MW03S-20190916	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3058771003	1	03MW06SI-20190917	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type MS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 62.2 and the control limits were 69 to 129.				
3058771003	2	03MW06SI-20190917	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3058771003	3	03MW06SI-20190917	SW846 8260C	1,4-Dioxane
The QC sample type MS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 48.5 and the control limits were 59 to 139.				
3058771003	4	03MW06SI-20190917	SW846 8260C	1,4-Dioxane
The QC sample type MSD for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 142 and the control limits were 59 to 139.				
3058771003	5	03MW06SI-20190917	SW846 8260C	1,4-Dioxane
The QC sample type MSD for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The RPD was reported as 98.1 and the upper control limit is 30.				
3058771003	6	03MW06SI-20190917	SW846 8260C	1,1-Dichloroethene
The QC sample type MS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 134 and the control limits were 71 to 131.				
3058771003	7	03MW06SI-20190917	SW846 8260C	1,1-Dichloroethene
The QC sample type MSD for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 132 and the control limits were 71 to 131.				
3058771003	8	03MW06SI-20190917	SW846 8260C	trans-1,2-Dichloroethene
The QC sample type MS for method SW846 8260C was outside the control limits for the analyte trans-1,2-Dichloroethene. The % Recovery was reported as 125 and the control limits were 75 to 124.				
3058771003	9	03MW06SI-20190917	SW846 7470A	Mercury, Total
One of the two matrix spike analyses performed on this sample failed to meet acceptable recovery limits. The other matrix spike was within acceptable recovery limits. Matrix interferences are the possible cause for the failure.				
3058771004	1	03MW06S-20190917	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3058771004	2	03MW06S-20190917	SW846 8260C	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260C was outside of control limits. The % Recovery was reported as 115 and the control limits were 85 to 114. This result was reported at a dilution of 1.				
3058771005	1	03MW02S-20190917	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 190 and the control limits were 59 to 139.				
3058771005	2	03MW02S-20190917	SW846 8260C	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260C was outside of control limits. The % Recovery was reported as 115 and the control limits were 85 to 114. This result was reported at a dilution of 1.				

ANALYTICAL RESULTS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

3058771006	1	03MW02I-20190917	SW846 8260C	1,4-Dioxane

The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 190 and the control limits were 59 to 139.

3058771007	1	03MW02SI-20190917	SW846 8260C	1,4-Dioxane

The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 190 and the control limits were 59 to 139.

3058771007	2	03MW02SI-20190917	SW846 8260C	4-Bromofluorobenzene

The surrogate 4-Bromofluorobenzene for method SW846 8260C was outside of control limits. The % Recovery was reported as 116 and the control limits were 85 to 114. This result was reported at a dilution of 1.

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID	Sample ID	Analysis Method	Prep Method
3058771001	TB-01-20190916	SW846 8260C	
3058771002	03MW03S-20190916	SW846 6020A	SW846 3015
3058771002	03MW03S-20190916	SW846 7470A	SW846 7470A
3058771002	03MW03S-20190916	SW846 8260C	
3058771002	03MW03S-20190916	Subcontract	
3058771003	03MW06SI-20190917	SW846 6020A	SW846 3015
3058771003	03MW06SI-20190917	SW846 7470A	SW846 7470A
3058771003	03MW06SI-20190917	SW846 8260C	
3058771003	03MW06SI-20190917	Subcontract	
3058771004	03MW06S-20190917	SW846 6020A	SW846 3015
3058771004	03MW06S-20190917	SW846 7470A	SW846 7470A
3058771004	03MW06S-20190917	SW846 8260C	
3058771004	03MW06S-20190917	Subcontract	
3058771005	03MW02S-20190917	SW846 6020A	SW846 3015
3058771005	03MW02S-20190917	SW846 7470A	SW846 7470A
3058771005	03MW02S-20190917	SW846 8260C	
3058771005	03MW02S-20190917	Subcontract	
3058771006	03MW02I-20190917	SW846 6020A	SW846 3015
3058771006	03MW02I-20190917	SW846 7470A	SW846 7470A
3058771006	03MW02I-20190917	SW846 8260C	
3058771006	03MW02I-20190917	Subcontract	
3058771007	03MW02SI-20190917	SW846 6020A	SW846 3015
3058771007	03MW02SI-20190917	SW846 7470A	SW846 7470A
3058771007	03MW02SI-20190917	SW846 8260C	
3058771007	03MW02SI-20190917	Subcontract	

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QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

QC Batch: MDIG/79983 **Analysis Method:** SW846 7470A

QC Batch Method: SW846 7470A

Associated Lab Samples: 3058771002, 3058771003, 3058771004, 3058771005, 3058771006, 3058771007

METHOD BLANK: 3015011

Parameter	Blank Result	Units	Reporting Limit
Mercury, Total	0.00033U	mg/L	0.00050

LABORATORY CONTROL SAMPLE: 3015012

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Mercury, Total	97	mg/L	.002	0.0019	82 - 119

MATRIX SPIKE: 3015014 DUPLICATE: 3015015 ORIGINAL: 3058771003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Mercury, Total	.00001	mg/L	.005	.00463	.00407	92.4	81.2*	82 - 119	12.9	20

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

QC Batch: MDIG/80070 **Analysis Method:** SW846 6020A

QC Batch Method: SW846 3015

Associated Lab Samples: 3058771002, 3058771003, 3058771004, 3058771005, 3058771006, 3058771007

METHOD BLANK: 3017605

Parameter	Blank Result	Units	Reporting Limit
Aluminum, Total	0.059U	mg/L	0.089
Antimony, Total	0.0015U	mg/L	0.0022
Arsenic, Total	0.0020U	mg/L	0.0030
Barium, Total	0.0037U	mg/L	0.0056
Beryllium, Total	0.00070U	mg/L	0.0010
Cadmium, Total	0.00070U	mg/L	0.0011
Calcium, Total	0.073U	mg/L	0.11
Chromium, Total	0.0015U	mg/L	0.0022
Cobalt, Total	0.0037U	mg/L	0.0056
Copper, Total	0.0028J	mg/L	0.0056
Iron, Total	0.037U	mg/L	0.056
Lead, Total	0.0015U	mg/L	0.0022
Magnesium, Total	0.073U	mg/L	0.11
Manganese, Total	0.0037U	mg/L	0.0056
Nickel, Total	0.0037U	mg/L	0.0056
Potassium, Total	0.073U	mg/L	0.11
Selenium, Total	0.0037U	mg/L	0.0056
Silver, Total	0.0015U	mg/L	0.0022
Sodium, Total	0.073U	mg/L	0.11
Thallium, Total	0.00070U	mg/L	0.0010
Vanadium, Total	0.0015U	mg/L	0.0022
Zinc, Total	0.0031J	mg/L	0.0056

LABORATORY CONTROL SAMPLE: 3017606

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Aluminum, Total	94.5	mg/L	2.2	2.1	84 - 117
Antimony, Total	98.3	mg/L	.22	0.22	85 - 117
Arsenic, Total	105	mg/L	.22	0.23	84 - 116
Barium, Total	99.8	mg/L	2.2	2.2	86 - 114
Beryllium, Total	99.2	mg/L	.22	0.22	83 - 121
Cadmium, Total	98.7	mg/L	.22	0.22	87 - 115
Calcium, Total	102	mg/L	2.2	2.3	87 - 118
Chromium, Total	100	mg/L	.22	0.22	85 - 116
Cobalt, Total	98.5	mg/L	.22	0.22	86 - 115

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Copper, Total	98.6	mg/L	.22	0.22	85 - 118
Iron, Total	102	mg/L	2.2	2.3	87 - 118
Lead, Total	103	mg/L	.22	0.23	88 - 115
Magnesium, Total	101	mg/L	2.2	2.2	83 - 118
Manganese, Total	102	mg/L	.22	0.23	87 - 115
Nickel, Total	103	mg/L	.22	0.23	85 - 117
Potassium, Total	103	mg/L	2.2	2.3	87 - 115
Selenium, Total	100	mg/L	.22	0.22	80 - 120
Silver, Total	97.4	mg/L	.11	0.11	85 - 116
Sodium, Total	103	mg/L	2.2	2.3	85 - 117
Thallium, Total	103	mg/L	.22	0.23	82 - 116
Vanadium, Total	101	mg/L	.22	0.22	86 - 115
Zinc, Total	96.9	mg/L	.22	0.22	83 - 119

MATRIX SPIKE: 3017608 DUPLICATE: 3017609 ORIGINAL: 3058771003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total	.02406	mg/L	2.2	2.08114	2.14493	92.6	95.4	84 - 117	3.02	20
Antimony, Total	.00009	mg/L	.22	.21528	.22283	96.8	100	85 - 117	3.44	20
Arsenic, Total	.00019	mg/L	.22	.22429	.22136	101	99.5	84 - 116	1.32	20
Barium, Total	.10991	mg/L	2.2	2.25289	2.35671	96.4	101	86 - 114	4.5	20
Beryllium, Total	.00022	mg/L	.22	.21539	.22482	96.8	101	83 - 121	4.29	20
Cadmium, Total	.00011	mg/L	.22	.21628	.22309	97.3	100	87 - 115	3.1	20
Calcium, Total	10.74566	mg/L	2.2	11.97273	12.18293	NC	NC	87 - 118	1.74	20
Chromium, Total	.00471	mg/L	.22	.22427	.23362	98.8	103	85 - 116	4.08	20
Cobalt, Total	.00018	mg/L	.22	.21125	.22053	95	99.2	86 - 115	4.3	20
Copper, Total	.0022	mg/L	.22	.2118	.21901	94.3	97.6	85 - 118	3.35	20
Iron, Total	.03999	mg/L	2.2	2.25523	2.25535	99.7	99.7	87 - 118	.005	20
Lead, Total	.00016	mg/L	.22	.22284	.23101	100	104	88 - 115	3.6	20
Magnesium, Total	3.68396	mg/L	2.2	5.52743	5.60593	83	86.5	83 - 115	1.41	20
Manganese, Total	.00391	mg/L	.22	.22357	.23917	98.8	106	87 - 115	6.74	20
Nickel, Total	.00494	mg/L	.22	.22331	.23105	98.3	102	85 - 117	3.41	20
Potassium, Total	1.1033	mg/L	2.2	3.30413	3.34037	99	101	87 - 115	1.09	20
Selenium, Total	.00121	mg/L	.22	.21713	.21328	97.2	95.4	80 - 120	1.79	20
Silver, Total	.00003	mg/L	.11	.10576	.10982	95.2	98.8	85 - 116	3.77	20
Sodium, Total	11.24693	mg/L	2.2	12.20283	12.22909	NC	NC	85 - 117	.21	20
Thallium, Total	.00002	mg/L	.22	.22098	.23205	99.4	104	82 - 116	4.88	20
Vanadium, Total	.00008	mg/L	.22	.21971	.23093	98.8	104	86 - 115	4.98	20
Zinc, Total	.00384	mg/L	.22	.21058	.2188	93	96.7	83 - 119	3.83	20

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

QC Batch: VOMS/52399 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3058771001, 3058771002, 3058771003, 3058771004

METHOD BLANK: 3015410

Parameter	Blank Result	Units	Reporting Limit
Acetone	3.8U	ug/L	5.0
Benzene	0.75U	ug/L	1.0
Bromochloromethane	0.75U	ug/L	1.0
Bromodichloromethane	0.75U	ug/L	1.0
Bromoform	0.75U	ug/L	1.0
Bromomethane	0.75U	ug/L	1.0
2-Butanone	3.8U	ug/L	5.0
Carbon Disulfide	0.75U	ug/L	1.0
Carbon Tetrachloride	0.75U	ug/L	1.0
Chlorobenzene	0.75U	ug/L	1.0
Chlorodibromomethane	0.75U	ug/L	1.0
Chloroethane	0.75U	ug/L	1.0
Chloroform	0.75U	ug/L	1.0
Chloromethane	0.75U	ug/L	1.0
Cyclohexane	0.75U	ug/L	1.0
1,2-Dibromo-3-chloropropane	2.5U	ug/L	5.0
1,2-Dibromoethane	0.75U	ug/L	1.0
1,2-Dichlorobenzene	0.75U	ug/L	1.0
1,3-Dichlorobenzene	0.75U	ug/L	1.0
1,4-Dichlorobenzene	0.75U	ug/L	1.0
Dichlorodifluoromethane	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloropropane	0.75U	ug/L	1.0
cis-1,3-Dichloropropene	0.75U	ug/L	1.0
trans-1,3-Dichloropropene	0.75U	ug/L	1.0
1,4-Dioxane	99.5J	ug/L	125
Ethylbenzene	0.75U	ug/L	1.0
Freon 113	0.75U	ug/L	1.0
2-Hexanone	3.8U	ug/L	5.0
Isopropylbenzene	0.75U	ug/L	1.0
Methyl acetate	0.75U	ug/L	1.0
Methyl cyclohexane	0.75U	ug/L	1.0
Methyl t-Butyl Ether	0.75U	ug/L	1.0

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

4-Methyl-2-Pentanone(MIBK)	3.8U	ug/L	5.0
Methylene Chloride	0.75U	ug/L	1.0
Styrene	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
Total Xylenes	2.3U	ug/L	3.0
1,2,3-Trichlorobenzene	0.75U	ug/L	1.0
1,2,4-Trichlorobenzene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Trichlorofluoromethane	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	104	%	81 - 118
4-Bromofluorobenzene (S)	112	%	85 - 114
Dibromofluoromethane (S)	103	%	80 - 119
Toluene-d8 (S)	105	%	89 - 112

LABORATORY CONTROL SAMPLE: 3015411

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Acetone	95	ug/L	100	95.0	39 - 160
Benzene	110	ug/L	20	22.0	79 - 120
Bromochloromethane	109	ug/L	20	21.9	78 - 123
Bromodichloromethane	108	ug/L	20	21.6	79 - 125
Bromoform	92.5	ug/L	20	18.5	66 - 130
Bromomethane	92.9	ug/L	20	18.6	53 - 141
2-Butanone	103	ug/L	100	103	56 - 143
Carbon Disulfide	101	ug/L	20	20.2	64 - 133
Carbon Tetrachloride	117	ug/L	20	23.4	72 - 136
Chlorobenzene	104	ug/L	20	20.7	82 - 118
Chlorodibromomethane	90.4	ug/L	20	18.1	74 - 126
Chloroethane	103	ug/L	20	20.6	60 - 138
Chloroform	105	ug/L	20	21.1	79 - 124
Chloromethane	99	ug/L	20	19.8	50 - 139
Cyclohexane	117	ug/L	20	23.5	71 - 130
1,2-Dibromo-3-chloropropane	87	ug/L	20	17.4	62 - 128
1,2-Dibromoethane	105	ug/L	20	20.9	77 - 121
1,2-Dichlorobenzene	103	ug/L	20	20.7	80 - 119
1,3-Dichlorobenzene	101	ug/L	20	20.2	80 - 119
1,4-Dichlorobenzene	98.9	ug/L	20	19.8	79 - 118
Dichlorodifluoromethane	94.9	ug/L	20	19.0	32 - 152

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

1,1-Dichloroethane	116	ug/L	20	23.1	77 - 125
1,2-Dichloroethane	107	ug/L	20	21.3	73 - 128
1,1-Dichloroethene	121	ug/L	20	24.2	71 - 131
cis-1,2-Dichloroethene	105	ug/L	20	21.0	78 - 123
trans-1,2-Dichloroethene	121	ug/L	20	24.2	75 - 124
1,2-Dichloropropane	106	ug/L	20	21.3	78 - 122
cis-1,3-Dichloropropene	109	ug/L	20	21.8	75 - 124
trans-1,3-Dichloropropene	108	ug/L	20	21.6	73 - 127
1,4-Dioxane	62.5	ug/L	500	313	59 - 139
Ethylbenzene	106	ug/L	20	21.1	79 - 121
Freon 113	106	ug/L	20	21.2	70 - 136
2-Hexanone	101	ug/L	100	101	57 - 139
Isopropylbenzene	112	ug/L	20	22.4	72 - 131
Methyl acetate	121	ug/L	20	24.1	56 - 136
Methyl cyclohexane	97.7	ug/L	20	19.5	72 - 132
Methyl t-Butyl Ether	108	ug/L	20	21.6	71 - 124
4-Methyl-2-Pentanone(MIBK)	112	ug/L	100	112	67 - 130
Methylene Chloride	108	ug/L	20	21.5	74 - 124
Styrene	110	ug/L	20	22.0	78 - 123
1,1,2,2-Tetrachloroethane	102	ug/L	20	20.3	71 - 121
Tetrachloroethene	108	ug/L	20	21.7	74 - 129
Toluene	108	ug/L	20	21.7	80 - 121
Total Xylenes	109	ug/L	60	65.4	79 - 121
1,2,3-Trichlorobenzene	73.4	ug/L	20	14.7	69 - 129
1,2,4-Trichlorobenzene	80.2	ug/L	20	16.0	69 - 130
1,1,1-Trichloroethane	117	ug/L	20	23.5	74 - 131
1,1,2-Trichloroethane	104	ug/L	20	20.8	80 - 119
Trichloroethene	105	ug/L	20	21.0	79 - 123
Trichlorofluoromethane	108	ug/L	20	21.6	65 - 141
Vinyl Chloride	109	ug/L	20	21.7	58 - 137
1,2-Dichloroethane-d4 (S)	106	%			81 - 118
4-Bromofluorobenzene (S)	108	%			85 - 114
Dibromofluoromethane (S)	102	%			80 - 119
Toluene-d8 (S)	102	%			89 - 112

MATRIX SPIKE: 3015848 DUPLICATE: 3015849 ORIGINAL: 3058771003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Acetone	0	ug/L	100	82.2038	94.3218	82.2	94.3	39 - 160	13.7	30
Benzene	0	ug/L	20	22.7069	23.1128	114	116	79 - 120	1.77	30
Bromochloromethane	0	ug/L	20	22.0586	22.2481	110	111	78 - 123	.86	30
Bromodichloromethane	0	ug/L	20	20.9446	21.6356	105	108	79 - 125	3.25	30

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Bromoform	0	ug/L	20	17.2522	17.6774	86.3	88.4	66 - 130	2.43	30
Bromomethane	0	ug/L	20	20.7692	17.4661	104	87.3	53 - 141	17.3	30
2-Butanone	0	ug/L	100	89.9207	103.506	89.9	104	56 - 143	14	30
Carbon Disulfide	0	ug/L	20	21.1583	21.8704	106	109	64 - 133	3.31	30
Carbon Tetrachloride	0	ug/L	20	24.5305	25.1793	123	126	72 - 136	2.61	30
Chlorobenzene	0	ug/L	20	20.6133	21.426	103	107	82 - 118	3.87	30
Chlorodibromomethane	0	ug/L	20	17.2573	17.9732	86.3	89.9	74 - 126	4.06	30
Chloroethane	0	ug/L	20	22.0895	22.0491	110	110	60 - 138	.18	30
Chloroform	0	ug/L	20	21.529	21.822	108	109	79 - 124	1.35	30
Chloromethane	0	ug/L	20	20.2745	21.4252	101	107	50 - 139	5.52	30
Cyclohexane	0	ug/L	20	25.2425	26.0317	126	130	71 - 130	3.08	30
1,2-Dibromo-3-chloropropane	0	ug/L	20	15.0372	16.9589	75.2	84.8	62 - 128	12	30
1,2-Dibromoethane	0	ug/L	20	19.7616	20.7756	98.8	104	77 - 121	5	30
1,2-Dichlorobenzene	0	ug/L	20	20.9355	21.3739	105	107	80 - 119	2.07	30
1,3-Dichlorobenzene	0	ug/L	20	20.5332	21.1066	103	106	80 - 119	2.75	30
1,4-Dichlorobenzene	0	ug/L	20	20.2675	20.7241	101	104	79 - 118	2.23	30
Dichlorodifluoromethane	0	ug/L	20	21.3506	22.0144	107	110	32 - 152	3.06	30
1,1-Dichloroethane	0	ug/L	20	23.9409	24	120	120	77 - 125	.25	30
1,2-Dichloroethane	0	ug/L	20	21.2518	21.097	106	105	73 - 128	.73	30
1,1-Dichloroethene	0	ug/L	20	26.7277	26.3268	134*	132*	71 - 131	1.51	30
cis-1,2-Dichloroethene	0	ug/L	20	21.52	21.8153	108	109	78 - 123	1.36	30
trans-1,2-Dichloroethene	0	ug/L	20	25.0169	24.615	125*	123	75 - 124	1.62	30
1,2-Dichloropropane	0	ug/L	20	21.6618	21.9258	108	110	78 - 122	1.21	30
cis-1,3-Dichloropropene	0	ug/L	20	20.8669	21.4624	104	107	75 - 124	2.81	30
trans-1,3-Dichloropropene	0	ug/L	20	20.6053	21.4205	103	107	73 - 127	3.88	30
1,4-Dioxane	0	ug/L	500	242.467	709.443	48.5*	142*	59 - 139	98.1	30
Ethylbenzene	0	ug/L	20	21.4512	22.4163	107	112	79 - 121	4.4	30
Freon 113	0	ug/L	20	23.3221	23.6856	117	118	70 - 136	1.55	30
2-Hexanone	0	ug/L	100	88.6043	99.9122	88.6	99.9	57 - 139	12	30
Isopropylbenzene	0	ug/L	20	23.6778	24.1432	118	121	72 - 131	1.95	30
Methyl acetate	0	ug/L	20	16.5144	18.0946	82.6	90.5	56 - 136	9.13	30
Methyl cyclohexane	0	ug/L	20	20.7548	21.7706	104	109	72 - 132	4.78	30
Methyl t-Butyl Ether	0	ug/L	20	21.2738	21.6184	106	108	71 - 124	1.61	30
4-Methyl-2-Pentanone(MIBK)	0	ug/L	100	102.359	112.606	102	113	67 - 130	9.53	30
Methylene Chloride	0	ug/L	20	21.7827	21.9205	109	110	74 - 124	.63	30
Styrene	0	ug/L	20	22.3869	22.6957	112	113	78 - 123	1.37	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	19.8824	20.5386	99.4	103	71 - 121	3.25	30
Tetrachloroethene	0	ug/L	20	21.0253	22.2103	105	111	74 - 129	5.48	30
Toluene	0	ug/L	20	21.8569	22.9129	109	115	80 - 121	4.72	30
Total Xylenes	0	ug/L	60	65.8794	68.9629	110	115	79 - 121	4.57	30
1,2,3-Trichlorobenzene	0	ug/L	20	12.4461	14.3544	62.2*	71.8	69 - 129	14.2	30
1,2,4-Trichlorobenzene	0	ug/L	20	14.3343	15.6168	71.7	78.1	69 - 130	8.56	30
1,1,1-Trichloroethane	0	ug/L	20	24.6132	25.322	123	127	74 - 131	2.84	30
1,1,2-Trichloroethane	0	ug/L	20	20.2285	20.8736	101	104	80 - 119	3.14	30
Trichloroethene	0	ug/L	20	21.8233	22.1426	109	111	79 - 123	1.45	30
Trichlorofluoromethane	0	ug/L	20	23.983	24.5999	120	123	65 - 141	2.54	30

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Vinyl Chloride	0	ug/L	20	23.0412	24.5992	115	123	58 - 137	6.54	30
1,2-Dichloroethane-d4 (S)	99.8	%				99.8	105	81 - 118		
4-Bromofluorobenzene (S)	108	%				108	108	85 - 114		
Dibromofluoromethane (S)	104	%				104	103	80 - 119		
Toluene-d8 (S)	101	%				101	104	89 - 112		

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

QC Batch: VOMS/52440 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3058771001, 3058771004, 3058771005, 3058771006, 3058771007

METHOD BLANK: 3017123

Parameter	Blank Result	Units	Reporting Limit
Acetone	3.8U	ug/L	5.0
Benzene	0.75U	ug/L	1.0
Bromochloromethane	0.75U	ug/L	1.0
Bromodichloromethane	0.75U	ug/L	1.0
Bromoform	0.75U	ug/L	1.0
Bromomethane	0.75U	ug/L	1.0
2-Butanone	3.8U	ug/L	5.0
Carbon Disulfide	0.75U	ug/L	1.0
Carbon Tetrachloride	0.75U	ug/L	1.0
Chlorobenzene	0.75U	ug/L	1.0
Chlorodibromomethane	0.75U	ug/L	1.0
Chloroethane	0.75U	ug/L	1.0
Chloroform	0.75U	ug/L	1.0
Chloromethane	0.75U	ug/L	1.0
Cyclohexane	0.75U	ug/L	1.0
1,2-Dibromo-3-chloropropane	2.5U	ug/L	5.0
1,2-Dibromoethane	0.75U	ug/L	1.0
1,2-Dichlorobenzene	0.75U	ug/L	1.0
1,3-Dichlorobenzene	0.75U	ug/L	1.0
1,4-Dichlorobenzene	0.75U	ug/L	1.0
Dichlorodifluoromethane	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloropropane	0.75U	ug/L	1.0
cis-1,3-Dichloropropene	0.75U	ug/L	1.0
trans-1,3-Dichloropropene	0.75U	ug/L	1.0
1,4-Dioxane	62.5U	ug/L	125
Ethylbenzene	0.75U	ug/L	1.0
Freon 113	0.75U	ug/L	1.0
2-Hexanone	3.8U	ug/L	5.0
Isopropylbenzene	0.75U	ug/L	1.0
Methyl acetate	0.75U	ug/L	1.0
Methyl cyclohexane	0.75U	ug/L	1.0
Methyl t-Butyl Ether	0.75U	ug/L	1.0

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

4-Methyl-2-Pentanone(MIBK)	3.8U	ug/L	5.0
Methylene Chloride	0.75U	ug/L	1.0
Styrene	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
Total Xylenes	2.3U	ug/L	3.0
1,2,3-Trichlorobenzene	0.75U	ug/L	1.0
1,2,4-Trichlorobenzene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Trichlorofluoromethane	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	106	%	81 - 118
4-Bromofluorobenzene (S)	116	%	85 - 114
Dibromofluoromethane (S)	102	%	80 - 119
Toluene-d8 (S)	105	%	89 - 112

LABORATORY CONTROL SAMPLE: 3017124

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Acetone	142	ug/L	100	142	39 - 160
Benzene	102	ug/L	20	20.5	79 - 120
Bromochloromethane	103	ug/L	20	20.6	78 - 123
Bromodichloromethane	105	ug/L	20	21.0	79 - 125
Bromoform	104	ug/L	20	20.8	66 - 130
Bromomethane	79	ug/L	20	15.8	53 - 141
2-Butanone	115	ug/L	100	115	56 - 143
Carbon Disulfide	89	ug/L	20	17.8	64 - 133
Carbon Tetrachloride	109	ug/L	20	21.8	72 - 136
Chlorobenzene	99.6	ug/L	20	19.9	82 - 118
Chlorodibromomethane	106	ug/L	20	21.2	74 - 126
Chloroethane	92.6	ug/L	20	18.5	60 - 138
Chloroform	100	ug/L	20	20.0	79 - 124
Chloromethane	93.9	ug/L	20	18.8	50 - 139
Cyclohexane	107	ug/L	20	21.4	71 - 130
1,2-Dibromo-3-chloropropane	101	ug/L	20	20.3	62 - 128
1,2-Dibromoethane	104	ug/L	20	20.7	77 - 121
1,2-Dichlorobenzene	101	ug/L	20	20.2	80 - 119
1,3-Dichlorobenzene	97.9	ug/L	20	19.6	80 - 119
1,4-Dichlorobenzene	95.8	ug/L	20	19.2	79 - 118
Dichlorodifluoromethane	90.4	ug/L	20	18.1	32 - 152

QUALITY CONTROL DATA

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

1,1-Dichloroethane	110	ug/L	20	22.0	77 - 125
1,2-Dichloroethane	101	ug/L	20	20.3	73 - 128
1,1-Dichloroethene	110	ug/L	20	22.0	71 - 131
cis-1,2-Dichloroethene	102	ug/L	20	20.5	78 - 123
trans-1,2-Dichloroethene	112	ug/L	20	22.5	75 - 124
1,2-Dichloropropane	103	ug/L	20	20.5	78 - 122
cis-1,3-Dichloropropene	110	ug/L	20	22.0	75 - 124
trans-1,3-Dichloropropene	113	ug/L	20	22.7	73 - 127
1,4-Dioxane	190*	ug/L	500	949	59 - 139
Ethylbenzene	100	ug/L	20	20.1	79 - 121
Freon 113	91.2	ug/L	20	18.2	70 - 136
2-Hexanone	99.7	ug/L	100	99.7	57 - 139
Isopropylbenzene	105	ug/L	20	21.0	72 - 131
Methyl acetate	109	ug/L	20	21.8	56 - 136
Methyl cyclohexane	104	ug/L	20	20.8	72 - 132
Methyl t-Butyl Ether	106	ug/L	20	21.3	71 - 124
4-Methyl-2-Pentanone(MIBK)	110	ug/L	100	110	67 - 130
Methylene Chloride	109	ug/L	20	21.8	74 - 124
Styrene	104	ug/L	20	20.9	78 - 123
1,1,2,2-Tetrachloroethane	105	ug/L	20	20.9	71 - 121
Tetrachloroethene	92.2	ug/L	20	18.4	74 - 129
Toluene	103	ug/L	20	20.6	80 - 121
Total Xylenes	104	ug/L	60	62.6	79 - 121
1,2,3-Trichlorobenzene	87.7	ug/L	20	17.5	69 - 129
1,2,4-Trichlorobenzene	87.9	ug/L	20	17.6	69 - 130
1,1,1-Trichloroethane	111	ug/L	20	22.1	74 - 131
1,1,2-Trichloroethane	101	ug/L	20	20.2	80 - 119
Trichloroethene	100	ug/L	20	20.1	79 - 123
Trichlorofluoromethane	97.5	ug/L	20	19.5	65 - 141
Vinyl Chloride	93.8	ug/L	20	18.8	58 - 137
1,2-Dichloroethane-d4 (S)	103	%			81 - 118
4-Bromofluorobenzene (S)	111	%			85 - 114
Dibromofluoromethane (S)	102	%			80 - 119
Toluene-d8 (S)	105	%			89 - 112

QUALITY CONTROL DATA QUALIFIERS

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

QUALITY CONTROL PARAMETER QUALIFIERS

Lab ID	#	Sample Type	Analytical Method	Analyte
3015410	1	Method Blank	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3017124	2	Lab Control Standard	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 190 and the control limits were 59 to 139.				
3017608	3	Matrix Spike	SW846 6020A	Sodium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
3017608	4	Matrix Spike	SW846 6020A	Calcium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3058771002	03MW03S-20190916	SW846 7470A	MDIG/79983	SW846 7470A	META/69977
3058771003	03MW06SI-20190917	SW846 7470A	MDIG/79983	SW846 7470A	META/69977
3058771004	03MW06S-20190917	SW846 7470A	MDIG/79983	SW846 7470A	META/69977
3058771005	03MW02S-20190917	SW846 7470A	MDIG/79983	SW846 7470A	META/69977
3058771006	03MW02I-20190917	SW846 7470A	MDIG/79983	SW846 7470A	META/69977
3058771007	03MW02SI-20190917	SW846 7470A	MDIG/79983	SW846 7470A	META/69977
3058771001	TB-01-20190916			SW846 8260C	VOMS/52399
3058771002	03MW03S-20190916			SW846 8260C	VOMS/52399
3058771003	03MW06SI-20190917			SW846 8260C	VOMS/52399
3058771004	03MW06S-20190917			SW846 8260C	VOMS/52399
3058771005	03MW02S-20190917			SW846 8260C	VOMS/52440
3058771006	03MW02I-20190917			SW846 8260C	VOMS/52440
3058771007	03MW02SI-20190917			SW846 8260C	VOMS/52440
3058771002	03MW03S-20190916	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3058771003	03MW06SI-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3058771004	03MW06S-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3058771005	03MW02S-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3058771006	03MW02I-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3058771007	03MW02SI-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3058771002	03MW03S-20190916	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3058771003	03MW06SI-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3058771004	03MW06S-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3058771005	03MW02S-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3058771006	03MW02I-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3058771007	03MW02SI-20190917	SW846 3015	MDIG/80070	SW846 6020A	META/70102

VMB

301 Fulling Mill Road
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

* 3 0 5 8 7 7 1 *

: 1 30587711 | 1 of 1

uote #: 190903035

Client Name: Tetra Tech	Container Type	VOA Vial	Poly	Poly	Poly	Poly									
Address: 234 Mall Boulevard Suite 260 King of Prussia, PA 19406	Container Size	40ml	125ml	1 Liter	1 Liter	1 Liter									
	Preservative	HCl	HNO_3	HNO_3	HNO_3	HNO_3									
Contact: Tricia Moore	ANALYSES/METHOD REQUESTED														
Phone#: 610 382 1173															
Project Name/#: Willow Grove Sites 3 and 12															
Bill To: Tetra Tech Foster Plaza 7															

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

Date Required: Approved?

Email? [ ] -Y

Fax? [ ] -Y No.:

	Sample Description/Location (as it will appear on the lab report)	Date Collected mm/dd/yy	Time hh:mm	*G or C	**Matrix	40 ml VOA Vial VOC's	125ml Poly Metals + Hg	1 Liter Poly Radium - 226	1 Liter Poly Strontium - 90	1 Liter Poly Uranium - 238						Sample/COC Comments
						Enter Number of Containers Per Sample or Field Results Below:										
1	TB-01-20190916	9/16/19	0800	G	Aq	2										Laboratory Supplied
2	03MW03S-20190916	9/16/19	1600	G	GW	2	1	1	1	1						
3	03MW06SI-20190917	9/17/19	1120	G	GW	6	3	3	3	3						Do MS/MSD
4	03MW06S-20190917	9/17/19	1125	G	GW	2	1	1	1	1						
5	03MW02S-20190917	9/17/19	1430	G	GW	2	1	1	1	1						
6	03MW02I-20190917	9/17/19	1445	G	GW	2	1	1	1	1						
7	03MW02SI-20190917	9/17/19	1615	G	GW	2	1	1	1	1						
8																
9																
10																

Receipt Information (completed by Receiving Lab)

W.O. Temp: ____ Therm ID: ____

Analyst Initials: ____

Courier/Tracking #:

Purchase Order #:

Project Comments:

ALS Field Services: □ Pickup □ Labor □ Composite Sampling □ Rental Equipment

Other: ____

SAMPLED BY (Please Print): Charles Meyer

Sampler Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Charles Meyer Tetra Tech	9/17/19	1930	2 FedEx		
3 FedEx			4 Reed ALS	9/18/19	0901
5			6		
7			8		
9			10		

Data Deliverables: [✓] Standard [ ] CLP-like [ ] USACE/DOD

Special Processing: USACE [ ]

State Samples Collected In: [ ] NY [ ] NJ [✓] PA

Reportable to PADEP? Yes [ ] No [✓]

PWSID #

Sample Disposal: Lab [✓] Special [ ]

EDDS: Format Type

other

* G=Grab; C=Composite

**Matrix - Al=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS SHIPPING ADDRESS: 301 Fulling Mill Road, Middletown, PA 17057

Rev 04/19

ALS

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

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
tetratech	3058771	EM	9/18/19

1. Were airbills / tracking numbers present and recorded?	NONE	(YES)	NO
Tracking number: 7762 6725 8537 + 8294			
2. Are Custody Seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: _____

Temperature (°C): 6

Thermometer ID: 403

Radiological (µCi): _____

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

Rev. 4/29/2019

Friday, October 18, 2019

Vanessa Badman
ALS Environmental
301 Fulling Mill Rd
Middletown, PA 17057

Re: ALS Workorder: 1909455
Project Name:
Project Number: 3058771

Dear Ms. Badman:

Six water samples were received from ALS Environmental, on 9/20/2019. The samples were scheduled for the following analyses:

Isotopic Uranium
Radium-226
Strontium-90

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Jeff R. Kujawa
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1909455

Radium-226:
The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

Strontium-90:
The samples were analyzed for the presence of ^{90}Sr according to the current revision of SOP 724.

All acceptance criteria were met.

Isotopic Uranium:
The samples were analyzed for the presence of isotopic uranium according to the current revision of SOP 714.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1909455
Client Name: ALS Environmental
Client Project Name:
Client Project Number: 3058771
Client PO Number: 3058771

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
3058771002	1909455-1		WATER	16-Sep-19	16:00
3058771003	1909455-2		WATER	16-Sep-19	11:20
3058771004	1909455-3		WATER	16-Sep-19	11:25
3058771005	1909455-4		WATER	16-Sep-19	14:30
3058771006	1909455-5		WATER	16-Sep-19	14:45
3058771007	1909455-6		WATER	16-Sep-19	16:15

Analytical Laboratory Services, Inc.
Environmental + Industrial Hygiene + Field Services
34 Dogwood Lane • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC #: 1a02455 | 1 of 1
ALSI Quote #:

Client Name: ALS Environmental
Address: 34 Dogwood Lane, Middletown, PA 17057
Contact: Vanessa Badman
Phone#: (717) 944-5541
Project Name/#: E3280: 3058771
Bill To: ALS Environmental
TAT: [ ] Normal-Standard TAT is 10-12 business days. [X] Rush-Subject to ALSI approval and surcharges.
Date Required: 9/27/2019 Approved By:
Email? [x] -Y ALMDTSUBCONTRACT@ALSGlobe
Fax? [ ] -Y No.:

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Container Type	Container Size	Preservative	Radium 226	Isotopic Ur-238	Strontium-90
					P	1L	HNO3	ANALYSES/METHOD REQUESTED		
								Enter Number of Containers Per Sample or Field Results Below.		
1 3058771 002	9/16/19	1600	G	WT				1	1	1
2 3058771 003 (MS/MSD)	9/16/19	1120	G	WT				3	3	3
3 3058771 004	9/16/19	1125	G	WT				1	1	1
4 3058771 005	9/16/19	1430	G	WT				1	1	1
5 3058771 006	9/16/19	1445	G	WT				1	1	1
6 3058771 007	9/16/19	1615	G	WT				1	1	1
7										
8										
9										
10										

Receipt Information (completed by Receiving Lab)
Cooler Temp: ____ Therm. ID: ____
No. of Coolers: ____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals Intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier/Tracking #:

Sample/COC Comments
Subcontract: ALS Fort Collins

ALSI Field Services: ☐Pickup ☐Labor ☐Composite Sampling ☐Rental Equipment ☐Other:

Project Comments:
LOGGED BY(signature): Date: Time:
REVIEWED BY(signature): Date: Time:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2	9/20/19	9:45
3	9-19-19	1600	4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [X] CLP-like [X] DOD [X] Internal COC
Special Processing: USACE [ ] Navy [ ] DOD [X]
State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ] other
Reportable to PADEP? Yes [ ] PWSID #:
Sample Disposal: Lab [X] Special [ ]
EDDs: Format Type: CUSTOM EDD, See e-mail.

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

Copies: WHITE - ORIGINAL CANARY - CUSTOMER MAILING PINK - FILE GOLDENROD - CUSTOMER COPY Rev 5/05

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS PA Workorder No: L2294455

Project Manager: JRC Initials: TEM Date: 9/21/19

1. Are airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
2. Are custody seals on **shipping** containers intact?	NONE	YES	NO *
3. Are custody seals on **sample** containers intact?	NONE	YES	NO *
4. Is there a COC (chain-of-custody) present?		YES	NO *
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		YES	NO *
6. Are short-hold samples present?		YES	NO
7. Are all samples within holding times for the requested analyses?		YES	NO *
8. Were all sample containers received intact? (not broken or leaking)		YES	NO *
9. Is there sufficient sample for the requested analyses?		YES	NO *
10. Are all samples in the proper containers for the requested analyses?		YES	NO *
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)	N/A	YES	NO *
12. Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO *
13. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	N/A	YES	NO
14. Were the samples shipped on ice?		YES	NO
15. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #1 #3 #4	RAD ONLY	YES	NO

Cooler #:	1							
Temperature (°C):	amb							
No. of custody seals on cooler:	0							
DOT Survey/ Acceptance Information — External µR/hr reading:	12							
Background µR/hr reading:	13							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / NA (If no, see Form 008.)

*** Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.**

All client bottle ID's vs ALS lab ID's double-checked by: TEM

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: 9-23-19

Form 201r27.xls
(02/11/2019)

*IR Gun #1, VWR SN 170560549
*IR Gun #3, VWR SN 170647571
*IR Gun #4, Oakton, SN 2372220101-0002

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
CONSIGNEE COPY - PLEASE PLACE IN FRONT OF POUCH
1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

Client: ALS Environmental **Date:** *18-Oct-19*
Project: 3058771 **Work Order:** 1909455
Sample ID: 3058771002 **Lab ID:** 1909455-1
Legal Location: **Matrix:** WATER
Collection Date: 9/16/2019 16:00 **Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/1/2019**	PrepBy: **AHJ**
Tracer: U-232	73.6		*30-110*	%REC	DL = NA	10/8/2019 08:10
U-238	0.101 (+/- 0.071)		0.077	pCi/l	NA	10/8/2019 08:10
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/9/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.28)	U	0.33	pCi/l	NA	10/15/2019 13:45
Carr: BARIUM	96.9		*40-110*	%REC	DL = NA	10/15/2019 13:45
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/10/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.4)	U	0.86	pCi/l	NA	10/16/2019 08:22
Carr: STRONTIUM	94.1		*40-110*	%REC	DL = NA	10/16/2019 08:22

Client:	ALS Environmental	**Date:**	*18-Oct-19*
Project:	3058771	**Work Order:**	1909455
Sample ID:	3058771003	**Lab ID:**	1909455-2
Legal Location:		**Matrix:**	WATER
Collection Date:	9/16/2019 11:20	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/1/2019**	PrepBy: **AHJ**
Tracer: U-232	66.7		*30-110*	%REC	DL = NA	10/8/2019 08:10
U-238	ND (+/- 0.041)	U	0.062	pCi/l	NA	10/8/2019 08:10
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/9/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.36)	U	0.71	pCi/l	NA	10/15/2019 14:02
Carr: BARIUM	96.4		*40-110*	%REC	DL = NA	10/15/2019 14:02
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/10/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.35)	U	0.87	pCi/l	NA	10/16/2019 08:22
Carr: STRONTIUM	91.4		*40-110*	%REC	DL = NA	10/16/2019 08:22

Client:	ALS Environmental	**Date:**	*18-Oct-19*
Project:	3058771	**Work Order:**	1909455
Sample ID:	3058771004	**Lab ID:**	1909455-3
Legal Location:		**Matrix:**	WATER
Collection Date:	9/16/2019 11:25	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/1/2019**	PrepBy: **AHJ**
Tracer: U-232	77		*30-110*	%REC	DL = NA	10/8/2019 08:10
U-238	ND (+/- 0.048)	U	0.063	pCi/l	NA	10/8/2019 08:10
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/9/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.23)	U	0.5	pCi/l	NA	10/15/2019 14:02
Carr: BARIUM	94.9		*40-110*	%REC	DL = NA	10/15/2019 14:02
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/10/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.38)	U	0.88	pCi/l	NA	10/16/2019 08:22
Carr: STRONTIUM	99.1		*40-110*	%REC	DL = NA	10/16/2019 08:22

Client: ALS Environmental **Date:** *18-Oct-19*
Project: 3058771 **Work Order:** 1909455
Sample ID: 3058771005 **Lab ID:** 1909455-4
Legal Location: **Matrix:** WATER
Collection Date: 9/16/2019 14:30 **Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/1/2019**	PrepBy: **AHJ**
Tracer: U-232	76		*30-110*	%REC	DL = NA	10/8/2019 08:10
U-238	0.199 (+/- 0.098)		0.075	pCi/l	NA	10/8/2019 08:10
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/9/2019**	PrepBy: **JXH**
Ra-226	0.49 (+/- 0.33)		0.35	pCi/l	NA	10/15/2019 14:02
Carr: BARIUM	94.5		*40-110*	%REC	DL = NA	10/15/2019 14:02
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/10/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.39)	U	0.91	pCi/l	NA	10/16/2019 08:22
Carr: STRONTIUM	96.9		*40-110*	%REC	DL = NA	10/16/2019 08:22

Client:	ALS Environmental	**Date:**	*18-Oct-19*
Project:	3058771	**Work Order:**	1909455
Sample ID:	3058771006	**Lab ID:**	1909455-5
Legal Location:		**Matrix:**	WATER
Collection Date:	9/16/2019 14:45	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/1/2019**	PrepBy: **AHJ**
Tracer: U-232	71.4		*30-110*	%REC	DL = NA	10/8/2019 08:10
U-238	0.2 (+/- 0.1)		0.07	pCi/l	NA	10/8/2019 08:10
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/9/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.26)	U	0.41	pCi/l	NA	10/15/2019 14:02
Carr: BARIUM	93		*40-110*	%REC	DL = NA	10/15/2019 14:02
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/10/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.35)	U	0.81	pCi/l	NA	10/16/2019 08:22
Carr: STRONTIUM	97		*40-110*	%REC	DL = NA	10/16/2019 08:22

Client:	ALS Environmental	**Date:**	*18-Oct-19*
Project:	3058771	**Work Order:**	1909455
Sample ID:	3058771007	**Lab ID:**	1909455-6
Legal Location:		**Matrix:**	WATER
Collection Date:	9/16/2019 16:15	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/1/2019**	PrepBy: **AHJ**
Tracer: U-232	*70.2*		*30-110*	*%REC*	DL = NA	10/8/2019 08:10
U-238	0.166 (+/- 0.091)		0.079	pCi/l	NA	10/8/2019 08:10
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/9/2019**	PrepBy: **JXH**
Ra-226	0.61 (+/- 0.39)		0.35	pCi/l	NA	10/15/2019 14:02
Carr: BARIUM	*92.5*		*40-110*	*%REC*	DL = NA	10/15/2019 14:02
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/10/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.41)	U	0.88	pCi/l	NA	10/16/2019 08:22
Carr: STRONTIUM	*90.4*		*40-110*	*%REC*	DL = NA	10/16/2019 08:22

Client:	ALS Environmental	**Date:**	*18-Oct-19*
Project:	3058771	**Work Order:**	1909455
Sample ID:	3058771007	**Lab ID:**	1909455-6
Legal Location:		**Matrix:**	WATER
Collection Date:	9/16/2019 16:15	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

- "Report Limit" is the MDC
U or ND - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110 %. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
G - Sample density differs by more than 15 % of LCS density.
D - DER is greater than Control Limit
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
NC - Not Calculated for duplicate results less than 5 times MDC
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
U or ND - Indicates that the compound was analyzed for but not detected.
E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
M - Duplicate injection precision was not met.
N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
* - Duplicate analysis (relative percent difference) not within control limits.
S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.
B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
E - Analyte concentration exceeds the upper level of the calibration range.
J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
A - A tentatively identified compound is a suspected aldol-condensation product.
X - The analyte was diluted below an accurate quantitation level.
* - The spike recovery is equal to or outside the control criteria used.
+ - The relative percent difference (RPD) equals or exceeds the control criteria.
G - A pattern resembling gasoline was detected in this sample
D - A pattern resembling diesel was detected in this sample.
M - A pattern resembling motor oil was detected in this sample.
C - A pattern resembling crude oil was detected in this sample.
4 - A pattern resembling JP-4 was detected in this sample.
5 - A pattern resembling JP-5 was detected in this sample.
H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: RE191009-1-1 Instrument ID: Alpha Scin Method: Radium-226 by Radon Emanation

DUP Sample ID: 1909455-2 Units: pCi/l Analysis Date: 10/15/2019 14:02
Client ID: 3058771003 Run ID: RE191009-1A Prep Date: 10/9/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.88						-0.04	0.1	2.1	U
Carr: BARIUM	16800		17440		96.3	40-110		16810			

LCS Sample ID: RE191009-1 Units: pCi/l Analysis Date: 10/15/2019 14:26
Client ID: Run ID: RE191009-1A Prep Date: 10/9/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	55 (44-14)	1	46.47		118	67-120					P
Carr: BARIUM	16380		17330		94.5	40-110					

MB Sample ID: RE191009-1 Units: pCi/l Analysis Date: 10/15/2019 14:26
Client ID: Run ID: RE191009-1A Prep Date: 10/9/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.54									U
Carr: BARIUM	16960		17330		98	40-110					

The following samples were analyzed in this batch:

1909455-1	1909455-2	1909455-3
1909455-4	1909455-5	1909455-6

Client: ALS Environmental
Work Order: 1909455
Project: 3058771

QC BATCH REPORT

Batch ID: AS191001-4-3 Instrument ID: AlphaSpec2 Method: Isotopic Uranium by Alpha Spec

DUP Sample ID: 1909455-2 Units: pCi/l Analysis Date: 10/6/2019 08:10
Client ID: 3058771003 Run ID: AS191001-4UR Prep Date: 10/1/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-238	ND	0.068						0.03	0.06	2.1	U
Tracer: U-232	5.7	0.1	8.152		73.4	30-110		6.1			

LCS Sample ID: AS191001-4 Units: pCi/l Analysis Date: 10/6/2019 08:10
Client ID: Run ID: AS191001-4UR Prep Date: 10/1/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-234	4.65 (+/-0.81)	0.03	4.22		110	82-122					P
U-238	4.43 (+/-0.78)	0.04	4.382		101	78-126					P
Tracer: U-232	3.46	0.06	4.576		75.6	30-110					

MB Sample ID: AS191001-4 Units: pCi/l Analysis Date: 10/10/2019 12:36
Client ID: Run ID: AS191001-4UR Prep Date: 10/1/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-238	ND	0.034									U
Tracer: U-232	3.42	0.03	4.576		74.7	30-110					

The following samples were analyzed in this batch:

1909455-1	1909455-2	1909455-3
1909455-4	1909455-5	1909455-6

Client: ALS Environmental
Work Order: 1909455
Project: 3058771

QC BATCH REPORT

Batch ID: SR191010-2-1 Instrument ID: LB4100-A Method: Strontium-90 by GFPC

DUP Sample ID: 1909455-2 Units: pCi/l Analysis Date: 10/16/2019 08:22
Client ID: 3058771003 Run ID: SR191010-2A Prep Date: 10/10/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	ND	0.9						-0.18	0.6	2.1	U
Carr: STRONTIUM	874.5		986.7		88.6	40-110		908			

LCS Sample ID: SR191010-2 Units: pCi/l Analysis Date: 10/16/2019 08:22
Client ID: Run ID: SR191010-2A Prep Date: 10/10/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	11.9 (+/-3)	1	11.54		103	75-125					P
Carr: STRONTIUM	803.1		964.8		83.2	40-110					

MB Sample ID: SR191010-2 Units: pCi/l Analysis Date: 10/16/2019 06:05
Client ID: Run ID: SR191010-2A Prep Date: 10/10/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	ND	0.52									U
Carr: STRONTIUM	841.5		964.8		87.2	40-110					

The following samples were analyzed in this batch:

1909455-1	1909455-2	1909455-3
1909455-4	1909455-5	1909455-6

ALS Environmental

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

October 28, 2019

Ms. Tricia Moore
Tetra Tech Inc

Certificate of Analysis

Project Name:	**Form Naval Air Station JRB/Willow Grove**	Workorder:	**3059231**
Purchase Order:		Workorder ID:	**EPR030|Willow Grove Sites 3 &**

Dear Ms. Moore:

Enclosed are the analytical results for samples received by the laboratory between Wednesday, September 18, 2019 and Thursday, September 19, 2019.

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 Mrs. Vanessa N Badman (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.

CC: Ms. Amy Thompson , Mr. Rick Carr , Ms. Megan Ritchie

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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October 28, 2019

Ms. Tricia Moore
Tetra Tech Inc

Certificate of Analysis

Project Name:	**Form Naval Air Station JRB/Willow Grove**	Workorder:	**3059231**
Purchase Order:		Workorder ID:	**EPR030|Willow Grove Sites 3 &**

Dear Ms. Moore:

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

CC: Ms. Amy Thompson , Mr. Rick Carr , Ms. Megan Ritchie

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

SAMPLE SUMMARY

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3059231001	03TB02-20190918	Water	9/18/2019 09:00	9/19/2019 21:33	Collected by Client
3059231002	03DUP01-20190918	Water	9/18/2019 12:00	9/19/2019 21:33	Collected by Client
3059231003	03MW04SI-20190918	Water	9/18/2019 12:30	9/19/2019 21:33	Collected by Client
3059231004	03MW04S-20190918	Water	9/18/2019 12:40	9/19/2019 21:33	Collected by Client
3059231005	03MW07S-20190918	Water	9/18/2019 15:00	9/19/2019 21:33	Collected by Client
3059231006	03MW09IS-20190918	Water	9/18/2019 15:05	9/19/2019 21:33	Collected by Client
3059231007	03RB01-20190918	Water	9/18/2019 18:00	9/19/2019 21:33	Collected by Client

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SAMPLE SUMMARY

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

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

PROJECT SUMMARY

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Workorder Comments

Please see attached subcontracting from ALS Ft. Collins. VNB 9/23/19

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231001** Date Collected: 9/18/2019 09:00 Matrix: Water

Sample ID: **03TB02-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 02:21	PDK	B
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 02:21	PDK	B
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/26/19 02:21	PDK	B
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/26/19 02:21	PDK	B
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 02:21	PDK	B
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 02:21	PDK	B

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ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231001** Date Collected: 9/18/2019 09:00 Matrix: Water

Sample ID: **03TB02-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/26/19 02:21	PDK	B
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/26/19 02:21	PDK	B
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 02:21	PDK	B

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	107		%	81 - 118	SW846 8260C			9/26/19 02:21	PDK	B
4-Bromofluorobenzene (S)	118	2	%	85 - 114	SW846 8260C			9/26/19 02:21	PDK	B
Dibromofluoromethane (S)	102		%	80 - 119	SW846 8260C			9/26/19 02:21	PDK	B
Toluene-d8 (S)	106		%	89 - 112	SW846 8260C			9/26/19 02:21	PDK	B

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231002** Date Collected: 9/18/2019 12:00 Matrix: Water

Sample ID: **03DUP01-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	5.3		ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 04:59	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 04:59	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/26/19 04:59	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/26/19 04:59	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/26/19 04:59	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/26/19 04:59	PDK	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231002** Date Collected: 9/18/2019 12:00 Matrix: Water

Sample ID: **03DUP01-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/26/19 04:59	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
Tetrachloroethene	3.4		ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/26/19 04:59	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/26/19 04:59	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	109		%	81 - 118	SW846 8260C			9/26/19 04:59	PDK	A
4-Bromofluorobenzene (S)	116	2	%	85 - 114	SW846 8260C			9/26/19 04:59	PDK	A
Dibromofluoromethane (S)	103		%	80 - 119	SW846 8260C			9/26/19 04:59	PDK	A
Toluene-d8 (S)	106		%	89 - 112	SW846 8260C			9/26/19 04:59	PDK	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:48	LXC	C
Barium, Total	0.30		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:48	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Calcium, Total	30.3		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Chromium, Total	0.0045		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Copper, Total	0.012		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:48	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:48	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Magnesium, Total	9.4		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 14:52	AHI	C
Nickel, Total	0.0023J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231002** Date Collected: 9/18/2019 12:00 Matrix: Water

Sample ID: **03DUP01-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	0.86		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:48	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Sodium, Total	17.5		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Vanadium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:46	LXC	C
Zinc, Total	0.0073		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:48	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/18/19 12:00	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231003** Date Collected: 9/18/2019 12:30 Matrix: Water

Sample ID: **03MW04SI-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	5.6		ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 05:48	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 05:48	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 05:48	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,1-Dichloroethene	0.75U	U,2	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 05:48	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 05:48	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:48	PDK	A

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ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231003** Date Collected: 9/18/2019 12:30 Matrix: Water

Sample ID: **03MW04SI-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 05:48	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
Tetrachloroethene	3.7		ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 05:48	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:48	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118	SW846 8260C			9/27/19 05:48	PDK	A
4-Bromofluorobenzene (S)	112		%	85 - 114	SW846 8260C			9/27/19 05:48	PDK	A
Dibromofluoromethane (S)	98.4		%	80 - 119	SW846 8260C			9/27/19 05:48	PDK	A
Toluene-d8 (S)	101		%	89 - 112	SW846 8260C			9/27/19 05:48	PDK	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:51	LXC	C
Barium, Total	0.30		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:51	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Calcium, Total	32.4		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Chromium, Total	0.0028		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Copper, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:51	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:51	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Magnesium, Total	8.4		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 14:54	AHI	C
Nickel, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C

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ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231003** Date Collected: 9/18/2019 12:30 Matrix: Water

Sample ID: **03MW04SI-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	0.71		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Selenium, Total	0.0022J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:51	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Sodium, Total	15.8		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Vanadium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:50	LXC	C
Zinc, Total	0.0030J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:51	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/18/19 12:30	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231004** Date Collected: 9/18/2019 12:40 Matrix: Water

Sample ID: **03MW04S-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.5J	J	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:11	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:11	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 06:11	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,1-Dichloroethene	0.75U	U,2	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 06:11	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:11	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:11	PDK	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231004** Date Collected: 9/18/2019 12:40 Matrix: Water

Sample ID: **03MW04S-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 06:11	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
Tetrachloroethene	2.8		ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 06:11	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:11	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C			9/27/19 06:11	PDK	A
4-Bromofluorobenzene (S)	114		%	85 - 114			SW846 8260C			9/27/19 06:11	PDK	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			9/27/19 06:11	PDK	A
Toluene-d8 (S)	101		%	89 - 112			SW846 8260C			9/27/19 06:11	PDK	A
METALS												
Aluminum, Total	0.19		mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:55	LXC	C
Barium, Total	0.38		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:55	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Calcium, Total	30.6		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Chromium, Total	0.0029		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Copper, Total	0.0024J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:55	LXC	C
Iron, Total	0.56		mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:55	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Magnesium, Total	12.0		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Manganese, Total	0.17		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 14:55	AHI	C
Nickel, Total	0.0024J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231004** Date Collected: 9/18/2019 12:40 Matrix: Water

Sample ID: **03MW04S-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	0.72		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:55	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Sodium, Total	13.9		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Vanadium, Total	0.0014J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:53	LXC	C
Zinc, Total	0.0061		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:55	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/18/19 12:40	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231005** Date Collected: 9/18/2019 15:00 Matrix: Water

Sample ID: **03MW07S-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:33	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:33	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 06:33	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,1-Dichloroethane	0.53J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,1-Dichloroethene	0.72J	J,3	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 06:33	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:33	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:33	PDK	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231005** Date Collected: 9/18/2019 15:00 Matrix: Water

Sample ID: **03MW07S-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 06:33	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
Tetrachloroethene	0.65J	J	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 06:33	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
1,1,1-Trichloroethane	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:33	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C			9/27/19 06:33	PDK	A
4-Bromofluorobenzene (S)	115	2	%	85 - 114			SW846 8260C			9/27/19 06:33	PDK	A
Dibromofluoromethane (S)	100		%	80 - 119			SW846 8260C			9/27/19 06:33	PDK	A
Toluene-d8 (S)	101		%	89 - 112			SW846 8260C			9/27/19 06:33	PDK	A
METALS												
Aluminum, Total	0.16		mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 01:58	LXC	C
Barium, Total	1.3		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:58	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Calcium, Total	123		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Chromium, Total	0.0024		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Copper, Total	0.0027J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:58	LXC	C
Iron, Total	0.097		mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 01:58	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Magnesium, Total	37.0		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Manganese, Total	0.013		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 14:56	AHI	C
Nickel, Total	0.0039J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231005** Date Collected: 9/18/2019 15:00 Matrix: Water

Sample ID: **03MW07S-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	1.3		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:58	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Sodium, Total	46.3		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Vanadium, Total	0.00095J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 04:56	LXC	C
Zinc, Total	0.0031J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 01:58	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/18/19 15:00	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231006** Date Collected: 9/18/2019 15:05 Matrix: Water

Sample ID: **03MW09IS-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:56	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:56	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 06:56	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,1-Dichloroethene	0.75U	U,2	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 06:56	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 06:56	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 06:56	PDK	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231006** Date Collected: 9/18/2019 15:05 Matrix: Water

Sample ID: **03MW09IS-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 06:56	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
Tetrachloroethene	3.8		ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 06:56	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 06:56	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118	SW846 8260C			9/27/19 06:56	PDK	A
4-Bromofluorobenzene (S)	114		%	85 - 114	SW846 8260C			9/27/19 06:56	PDK	A
Dibromofluoromethane (S)	98.2		%	80 - 119	SW846 8260C			9/27/19 06:56	PDK	A
Toluene-d8 (S)	101		%	89 - 112	SW846 8260C			9/27/19 06:56	PDK	A

METALS

Aluminum, Total	0.20		mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 02:01	LXC	C
Barium, Total	0.20		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Calcium, Total	24.0		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Chromium, Total	0.0053		mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Copper, Total	0.026		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:01	LXC	C
Iron, Total	0.20		mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 02:01	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Magnesium, Total	7.6		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Manganese, Total	0.012		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 14:57	AHI	C
Nickel, Total	0.0038J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231006** Date Collected: 9/18/2019 15:05 Matrix: Water

Sample ID: **03MW09IS-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	0.88		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Selenium, Total	0.0020J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:01	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Sodium, Total	11.5		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Vanadium, Total	0.00093J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:00	LXC	C
Zinc, Total	0.0045J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:01	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/18/19 15:05	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231007** Date Collected: 9/18/2019 18:00 Matrix: Water

Sample ID: **03RB01-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.2J	J	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 05:03	PDK	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 05:03	PDK	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 05:03	PDK	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,1-Dichloroethene	0.75U	U,2	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 05:03	PDK	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 05:03	PDK	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 05:03	PDK	A

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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

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231007** Date Collected: 9/18/2019 18:00 Matrix: Water

Sample ID: **03RB01-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 05:03	PDK	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 05:03	PDK	A
1,2,3-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 05:03	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118	SW846 8260C			9/27/19 05:03	PDK	A
4-Bromofluorobenzene (S)	114		%	85 - 114	SW846 8260C			9/27/19 05:03	PDK	A
Dibromofluoromethane (S)	98.2		%	80 - 119	SW846 8260C			9/27/19 05:03	PDK	A
Toluene-d8 (S)	101		%	89 - 112	SW846 8260C			9/27/19 05:03	PDK	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 02:05	LXC	C
Barium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Calcium, Total	0.047J	J	mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Chromium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Copper, Total	0.0031J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:05	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 02:05	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Magnesium, Total	0.073U	U	mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 14:58	AHI	C
Nickel, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID: **3059231007** Date Collected: 9/18/2019 18:00 Matrix: Water

Sample ID: **03RB01-20190918** Date Received: 9/19/2019 21:33

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Potassium, Total	0.073U	U	mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:05	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Sodium, Total	0.073U	U	mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Vanadium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:03	LXC	C
Zinc, Total	0.0060		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:05	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/18/19 18:00	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3059231001	1	03TB02-20190918	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 190 and the control limits were 59 to 139.				
3059231001	2	03TB02-20190918	SW846 8260C	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260C was outside of control limits. The % Recovery was reported as 118 and the control limits were 85 to 114. This result was reported at a dilution of 1.				
3059231002	1	03DUP01-20190918	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 190 and the control limits were 59 to 139.				
3059231002	2	03DUP01-20190918	SW846 8260C	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260C was outside of control limits. The % Recovery was reported as 116 and the control limits were 85 to 114. This result was reported at a dilution of 1.				
3059231003	1	03MW04SI-20190918	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 181 and the control limits were 59 to 139.				
3059231003	2	03MW04SI-20190918	SW846 8260C	1,1-Dichloroethene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 135 and the control limits were 71 to 131.				
3059231004	1	03MW04S-20190918	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 181 and the control limits were 59 to 139.				
3059231004	2	03MW04S-20190918	SW846 8260C	1,1-Dichloroethene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 135 and the control limits were 71 to 131.				
3059231005	1	03MW07S-20190918	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 181 and the control limits were 59 to 139.				
3059231005	2	03MW07S-20190918	SW846 8260C	4-Bromofluorobenzene
The surrogate 4-Bromofluorobenzene for method SW846 8260C was outside of control limits. The % Recovery was reported as 115 and the control limits were 85 to 114. This result was reported at a dilution of 1.				
3059231005	3	03MW07S-20190918	SW846 8260C	1,1-Dichloroethene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 135 and the control limits were 71 to 131.				
3059231006	1	03MW09IS-20190918	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 181 and the control limits were 59 to 139.				
3059231006	2	03MW09IS-20190918	SW846 8260C	1,1-Dichloroethene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 135 and the control limits were 71 to 131.				
3059231007	1	03RB01-20190918	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 181 and the control limits were 59 to 139.				

ANALYTICAL RESULTS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

3059231007	2	03RB01-20190918	SW846 8260C	1,1-Dichloroethene

The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 135 and the control limits were 71 to 131.

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID	Sample ID	Analysis Method	Prep Method
3059231001	03TB02-20190918	SW846 8260C	
3059231002	03DUP01-20190918	SW846 6020A	SW846 3015
3059231002	03DUP01-20190918	SW846 7470A	SW846 7470A
3059231002	03DUP01-20190918	SW846 8260C	
3059231002	03DUP01-20190918	Subcontract	
3059231003	03MW04SI-20190918	SW846 6020A	SW846 3015
3059231003	03MW04SI-20190918	SW846 7470A	SW846 7470A
3059231003	03MW04SI-20190918	SW846 8260C	
3059231003	03MW04SI-20190918	Subcontract	
3059231004	03MW04S-20190918	SW846 6020A	SW846 3015
3059231004	03MW04S-20190918	SW846 7470A	SW846 7470A
3059231004	03MW04S-20190918	SW846 8260C	
3059231004	03MW04S-20190918	Subcontract	
3059231005	03MW07S-20190918	SW846 6020A	SW846 3015
3059231005	03MW07S-20190918	SW846 7470A	SW846 7470A
3059231005	03MW07S-20190918	SW846 8260C	
3059231005	03MW07S-20190918	Subcontract	
3059231006	03MW09IS-20190918	SW846 6020A	SW846 3015
3059231006	03MW09IS-20190918	SW846 7470A	SW846 7470A
3059231006	03MW09IS-20190918	SW846 8260C	
3059231006	03MW09IS-20190918	Subcontract	
3059231007	03RB01-20190918	SW846 6020A	SW846 3015
3059231007	03RB01-20190918	SW846 7470A	SW846 7470A
3059231007	03RB01-20190918	SW846 8260C	
3059231007	03RB01-20190918	Subcontract	

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

QC Batch: MDIG/80070 **Analysis Method:** SW846 6020A

QC Batch Method: SW846 3015

Associated Lab Samples: 3059231002, 3059231003, 3059231004, 3059231005, 3059231006, 3059231007

METHOD BLANK: 3017605

Parameter	Blank Result	Units	Reporting Limit
Aluminum, Total	0.059U	mg/L	0.089
Antimony, Total	0.0015U	mg/L	0.0022
Arsenic, Total	0.0020U	mg/L	0.0030
Barium, Total	0.0037U	mg/L	0.0056
Beryllium, Total	0.00070U	mg/L	0.0010
Cadmium, Total	0.00070U	mg/L	0.0011
Calcium, Total	0.073U	mg/L	0.11
Chromium, Total	0.0015U	mg/L	0.0022
Cobalt, Total	0.0037U	mg/L	0.0056
Copper, Total	0.0028J	mg/L	0.0056
Iron, Total	0.037U	mg/L	0.056
Lead, Total	0.0015U	mg/L	0.0022
Magnesium, Total	0.073U	mg/L	0.11
Manganese, Total	0.0037U	mg/L	0.0056
Nickel, Total	0.0037U	mg/L	0.0056
Potassium, Total	0.073U	mg/L	0.11
Selenium, Total	0.0037U	mg/L	0.0056
Silver, Total	0.0015U	mg/L	0.0022
Sodium, Total	0.073U	mg/L	0.11
Thallium, Total	0.00070U	mg/L	0.0010
Vanadium, Total	0.0015U	mg/L	0.0022
Zinc, Total	0.0031J	mg/L	0.0056

LABORATORY CONTROL SAMPLE: 3017606

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Aluminum, Total	94.5	mg/L	2.2	2.1	84 - 117
Antimony, Total	98.3	mg/L	.22	0.22	85 - 117
Arsenic, Total	105	mg/L	.22	0.23	84 - 116
Barium, Total	99.8	mg/L	2.2	2.2	86 - 114
Beryllium, Total	99.2	mg/L	.22	0.22	83 - 121
Cadmium, Total	98.7	mg/L	.22	0.22	87 - 115
Calcium, Total	102	mg/L	2.2	2.3	87 - 118
Chromium, Total	100	mg/L	.22	0.22	85 - 116
Cobalt, Total	98.5	mg/L	.22	0.22	86 - 115

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Copper, Total	98.6	mg/L	.22	0.22	85 - 118
Iron, Total	102	mg/L	2.2	2.3	87 - 118
Lead, Total	103	mg/L	.22	0.23	88 - 115
Magnesium, Total	101	mg/L	2.2	2.2	83 - 118
Manganese, Total	102	mg/L	.22	0.23	87 - 115
Nickel, Total	103	mg/L	.22	0.23	85 - 117
Potassium, Total	103	mg/L	2.2	2.3	87 - 115
Selenium, Total	100	mg/L	.22	0.22	80 - 120
Silver, Total	97.4	mg/L	.11	0.11	85 - 116
Sodium, Total	103	mg/L	2.2	2.3	85 - 117
Thallium, Total	103	mg/L	.22	0.23	82 - 116
Vanadium, Total	101	mg/L	.22	0.22	86 - 115
Zinc, Total	96.9	mg/L	.22	0.22	83 - 119

MATRIX SPIKE: 3017608 DUPLICATE: 3017609 ORIGINAL: 3058771003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total	.02406	mg/L	2.2	2.08114	2.14493	92.6	95.4	84 - 117	3.02	20
Antimony, Total	.00009	mg/L	.22	.21528	.22283	96.8	100	85 - 117	3.44	20
Arsenic, Total	.00019	mg/L	.22	.22429	.22136	101	99.5	84 - 116	1.32	20
Barium, Total	.10991	mg/L	2.2	2.25289	2.35671	96.4	101	86 - 114	4.5	20
Beryllium, Total	.00022	mg/L	.22	.21539	.22482	96.8	101	83 - 121	4.29	20
Cadmium, Total	.00011	mg/L	.22	.21628	.22309	97.3	100	87 - 115	3.1	20
Calcium, Total	10.74566	mg/L	2.2	11.97273	12.18293	NC	NC	87 - 118	1.74	20
Chromium, Total	.00471	mg/L	.22	.22427	.23362	98.8	103	85 - 116	4.08	20
Cobalt, Total	.00018	mg/L	.22	.21125	.22053	95	99.2	86 - 115	4.3	20
Copper, Total	.0022	mg/L	.22	.2118	.21901	94.3	97.6	85 - 118	3.35	20
Iron, Total	.03999	mg/L	2.2	2.25523	2.25535	99.7	99.7	87 - 118	.005	20
Lead, Total	.00016	mg/L	.22	.22284	.23101	100	104	88 - 115	3.6	20
Magnesium, Total	3.68396	mg/L	2.2	5.52743	5.60593	83	86.5	83 - 115	1.41	20
Manganese, Total	.00391	mg/L	.22	.22357	.23917	98.8	106	87 - 115	6.74	20
Nickel, Total	.00494	mg/L	.22	.22331	.23105	98.3	102	85 - 117	3.41	20
Potassium, Total	1.1033	mg/L	2.2	3.30413	3.34037	99	101	87 - 115	1.09	20
Selenium, Total	.00121	mg/L	.22	.21713	.21328	97.2	95.4	80 - 120	1.79	20
Silver, Total	.00003	mg/L	.11	.10576	.10982	95.2	98.8	85 - 116	3.77	20
Sodium, Total	11.24693	mg/L	2.2	12.20283	12.22909	NC	NC	85 - 117	.21	20
Thallium, Total	.00002	mg/L	.22	.22098	.23205	99.4	104	82 - 116	4.88	20
Vanadium, Total	.00008	mg/L	.22	.21971	.23093	98.8	104	86 - 115	4.98	20
Zinc, Total	.00384	mg/L	.22	.21058	.2188	93	96.7	83 - 119	3.83	20

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

QC Batch: MDIG/80082 **Analysis Method:** SW846 7470A

QC Batch Method: SW846 7470A

Associated Lab Samples: 3059231002, 3059231003, 3059231004, 3059231005, 3059231006, 3059231007

METHOD BLANK: 3017954

Parameter	Blank Result	Units	Reporting Limit
Mercury, Total	0.00033U	mg/L	0.00050

LABORATORY CONTROL SAMPLE: 3017956

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Mercury, Total	88.5	mg/L	.002	0.0018	82 - 119

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

QC Batch: VOMS/52440 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3059231001, 3059231002

METHOD BLANK: 3017123

Parameter	Blank Result	Units	Reporting Limit
Acetone	3.8U	ug/L	5.0
Benzene	0.75U	ug/L	1.0
Bromochloromethane	0.75U	ug/L	1.0
Bromodichloromethane	0.75U	ug/L	1.0
Bromoform	0.75U	ug/L	1.0
Bromomethane	0.75U	ug/L	1.0
2-Butanone	3.8U	ug/L	5.0
Carbon Disulfide	0.75U	ug/L	1.0
Carbon Tetrachloride	0.75U	ug/L	1.0
Chlorobenzene	0.75U	ug/L	1.0
Chlorodibromomethane	0.75U	ug/L	1.0
Chloroethane	0.75U	ug/L	1.0
Chloroform	0.75U	ug/L	1.0
Chloromethane	0.75U	ug/L	1.0
Cyclohexane	0.75U	ug/L	1.0
1,2-Dibromo-3-chloropropane	2.5U	ug/L	5.0
1,2-Dibromoethane	0.75U	ug/L	1.0
1,2-Dichlorobenzene	0.75U	ug/L	1.0
1,3-Dichlorobenzene	0.75U	ug/L	1.0
1,4-Dichlorobenzene	0.75U	ug/L	1.0
Dichlorodifluoromethane	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloropropane	0.75U	ug/L	1.0
cis-1,3-Dichloropropene	0.75U	ug/L	1.0
trans-1,3-Dichloropropene	0.75U	ug/L	1.0
1,4-Dioxane	62.5U	ug/L	125
Ethylbenzene	0.75U	ug/L	1.0
Freon 113	0.75U	ug/L	1.0
2-Hexanone	3.8U	ug/L	5.0
Isopropylbenzene	0.75U	ug/L	1.0
Methyl acetate	0.75U	ug/L	1.0
Methyl cyclohexane	0.75U	ug/L	1.0
Methyl t-Butyl Ether	0.75U	ug/L	1.0

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

4-Methyl-2-Pentanone(MIBK)	3.8U	ug/L	5.0
Methylene Chloride	0.75U	ug/L	1.0
Styrene	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
Total Xylenes	2.3U	ug/L	3.0
1,2,3-Trichlorobenzene	0.75U	ug/L	1.0
1,2,4-Trichlorobenzene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Trichlorofluoromethane	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	106	%	81 - 118
4-Bromofluorobenzene (S)	116	%	85 - 114
Dibromofluoromethane (S)	102	%	80 - 119
Toluene-d8 (S)	105	%	89 - 112

LABORATORY CONTROL SAMPLE: 3017124

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Acetone	142	ug/L	100	142	39 - 160
Benzene	102	ug/L	20	20.5	79 - 120
Bromochloromethane	103	ug/L	20	20.6	78 - 123
Bromodichloromethane	105	ug/L	20	21.0	79 - 125
Bromoform	104	ug/L	20	20.8	66 - 130
Bromomethane	79	ug/L	20	15.8	53 - 141
2-Butanone	115	ug/L	100	115	56 - 143
Carbon Disulfide	89	ug/L	20	17.8	64 - 133
Carbon Tetrachloride	109	ug/L	20	21.8	72 - 136
Chlorobenzene	99.6	ug/L	20	19.9	82 - 118
Chlorodibromomethane	106	ug/L	20	21.2	74 - 126
Chloroethane	92.6	ug/L	20	18.5	60 - 138
Chloroform	100	ug/L	20	20.0	79 - 124
Chloromethane	93.9	ug/L	20	18.8	50 - 139
Cyclohexane	107	ug/L	20	21.4	71 - 130
1,2-Dibromo-3-chloropropane	101	ug/L	20	20.3	62 - 128
1,2-Dibromoethane	104	ug/L	20	20.7	77 - 121
1,2-Dichlorobenzene	101	ug/L	20	20.2	80 - 119
1,3-Dichlorobenzene	97.9	ug/L	20	19.6	80 - 119
1,4-Dichlorobenzene	95.8	ug/L	20	19.2	79 - 118
Dichlorodifluoromethane	90.4	ug/L	20	18.1	32 - 152

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

1,1-Dichloroethane	110	ug/L	20	22.0	77 - 125
1,2-Dichloroethane	101	ug/L	20	20.3	73 - 128
1,1-Dichloroethene	110	ug/L	20	22.0	71 - 131
cis-1,2-Dichloroethene	102	ug/L	20	20.5	78 - 123
trans-1,2-Dichloroethene	112	ug/L	20	22.5	75 - 124
1,2-Dichloropropane	103	ug/L	20	20.5	78 - 122
cis-1,3-Dichloropropene	110	ug/L	20	22.0	75 - 124
trans-1,3-Dichloropropene	113	ug/L	20	22.7	73 - 127
1,4-Dioxane	190*	ug/L	500	949	59 - 139
Ethylbenzene	100	ug/L	20	20.1	79 - 121
Freon 113	91.2	ug/L	20	18.2	70 - 136
2-Hexanone	99.7	ug/L	100	99.7	57 - 139
Isopropylbenzene	105	ug/L	20	21.0	72 - 131
Methyl acetate	109	ug/L	20	21.8	56 - 136
Methyl cyclohexane	104	ug/L	20	20.8	72 - 132
Methyl t-Butyl Ether	106	ug/L	20	21.3	71 - 124
4-Methyl-2-Pentanone(MIBK)	110	ug/L	100	110	67 - 130
Methylene Chloride	109	ug/L	20	21.8	74 - 124
Styrene	104	ug/L	20	20.9	78 - 123
1,1,2,2-Tetrachloroethane	105	ug/L	20	20.9	71 - 121
Tetrachloroethene	92.2	ug/L	20	18.4	74 - 129
Toluene	103	ug/L	20	20.6	80 - 121
Total Xylenes	104	ug/L	60	62.6	79 - 121
1,2,3-Trichlorobenzene	87.7	ug/L	20	17.5	69 - 129
1,2,4-Trichlorobenzene	87.9	ug/L	20	17.6	69 - 130
1,1,1-Trichloroethane	111	ug/L	20	22.1	74 - 131
1,1,2-Trichloroethane	101	ug/L	20	20.2	80 - 119
Trichloroethene	100	ug/L	20	20.1	79 - 123
Trichlorofluoromethane	97.5	ug/L	20	19.5	65 - 141
Vinyl Chloride	93.8	ug/L	20	18.8	58 - 137
1,2-Dichloroethane-d4 (S)	103	%			81 - 118
4-Bromofluorobenzene (S)	111	%			85 - 114
Dibromofluoromethane (S)	102	%			80 - 119
Toluene-d8 (S)	105	%			89 - 112

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

QC Batch: VOMS/52445 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3059231003, 3059231004, 3059231005, 3059231006, 3059231007

METHOD BLANK: 3017575

Parameter	Blank Result	Units	Reporting Limit
Acetone	3.8U	ug/L	5.0
Benzene	0.75U	ug/L	1.0
Bromochloromethane	0.75U	ug/L	1.0
Bromodichloromethane	0.75U	ug/L	1.0
Bromoform	0.75U	ug/L	1.0
Bromomethane	0.75U	ug/L	1.0
2-Butanone	3.8U	ug/L	5.0
Carbon Disulfide	0.75U	ug/L	1.0
Carbon Tetrachloride	0.75U	ug/L	1.0
Chlorobenzene	0.75U	ug/L	1.0
Chlorodibromomethane	0.75U	ug/L	1.0
Chloroethane	0.75U	ug/L	1.0
Chloroform	0.75U	ug/L	1.0
Chloromethane	0.75U	ug/L	1.0
Cyclohexane	0.75U	ug/L	1.0
1,2-Dibromo-3-chloropropane	2.5U	ug/L	5.0
1,2-Dibromoethane	0.75U	ug/L	1.0
1,2-Dichlorobenzene	0.75U	ug/L	1.0
1,3-Dichlorobenzene	0.75U	ug/L	1.0
1,4-Dichlorobenzene	0.75U	ug/L	1.0
Dichlorodifluoromethane	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloropropane	0.75U	ug/L	1.0
cis-1,3-Dichloropropene	0.75U	ug/L	1.0
trans-1,3-Dichloropropene	0.75U	ug/L	1.0
1,4-Dioxane	62.5U	ug/L	125
Ethylbenzene	0.75U	ug/L	1.0
Freon 113	0.75U	ug/L	1.0
2-Hexanone	3.8U	ug/L	5.0
Isopropylbenzene	0.75U	ug/L	1.0
Methyl acetate	0.75U	ug/L	1.0
Methyl cyclohexane	0.75U	ug/L	1.0
Methyl t-Butyl Ether	0.75U	ug/L	1.0

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

4-Methyl-2-Pentanone(MIBK)	3.8U	ug/L	5.0
Methylene Chloride	0.75U	ug/L	1.0
Styrene	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
Total Xylenes	2.3U	ug/L	3.0
1,2,3-Trichlorobenzene	0.75U	ug/L	1.0
1,2,4-Trichlorobenzene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Trichlorofluoromethane	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	103	%	81 - 118
4-Bromofluorobenzene (S)	112	%	85 - 114
Dibromofluoromethane (S)	99.3	%	80 - 119
Toluene-d8 (S)	99.9	%	89 - 112

LABORATORY CONTROL SAMPLE: 3017576

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Acetone	115	ug/L	100	115	39 - 160
Benzene	108	ug/L	20	21.5	79 - 120
Bromochloromethane	102	ug/L	20	20.5	78 - 123
Bromodichloromethane	107	ug/L	20	21.4	79 - 125
Bromoform	109	ug/L	20	21.8	66 - 130
Bromomethane	72.6	ug/L	20	14.5	53 - 141
2-Butanone	122	ug/L	100	122	56 - 143
Carbon Disulfide	104	ug/L	20	20.7	64 - 133
Carbon Tetrachloride	114	ug/L	20	22.9	72 - 136
Chlorobenzene	100	ug/L	20	20.1	82 - 118
Chlorodibromomethane	105	ug/L	20	20.9	74 - 126
Chloroethane	89	ug/L	20	17.8	60 - 138
Chloroform	103	ug/L	20	20.5	79 - 124
Chloromethane	95.9	ug/L	20	19.2	50 - 139
Cyclohexane	115	ug/L	20	23.0	71 - 130
1,2-Dibromo-3-chloropropane	98.8	ug/L	20	19.8	62 - 128
1,2-Dibromoethane	101	ug/L	20	20.3	77 - 121
1,2-Dichlorobenzene	102	ug/L	20	20.4	80 - 119
1,3-Dichlorobenzene	101	ug/L	20	20.3	80 - 119
1,4-Dichlorobenzene	97.6	ug/L	20	19.5	79 - 118
Dichlorodifluoromethane	90.1	ug/L	20	18.0	32 - 152

QUALITY CONTROL DATA

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

1,1-Dichloroethane	117	ug/L	20	23.4	77 - 125
1,2-Dichloroethane	104	ug/L	20	20.7	73 - 128
1,1-Dichloroethene	135*	ug/L	20	27.0	71 - 131
cis-1,2-Dichloroethene	105	ug/L	20	21.0	78 - 123
trans-1,2-Dichloroethene	122	ug/L	20	24.4	75 - 124
1,2-Dichloropropane	107	ug/L	20	21.5	78 - 122
cis-1,3-Dichloropropene	105	ug/L	20	21.0	75 - 124
trans-1,3-Dichloropropene	106	ug/L	20	21.1	73 - 127
1,4-Dioxane	181*	ug/L	500	903	59 - 139
Ethylbenzene	103	ug/L	20	20.7	79 - 121
Freon 113	105	ug/L	20	20.9	70 - 136
2-Hexanone	95	ug/L	100	95.0	57 - 139
Isopropylbenzene	114	ug/L	20	22.7	72 - 131
Methyl acetate	127	ug/L	20	25.4	56 - 136
Methyl cyclohexane	114	ug/L	20	22.7	72 - 132
Methyl t-Butyl Ether	109	ug/L	20	21.8	71 - 124
4-Methyl-2-Pentanone(MIBK)	97.1	ug/L	100	97.1	67 - 130
Methylene Chloride	110	ug/L	20	22.0	74 - 124
Styrene	108	ug/L	20	21.6	78 - 123
1,1,2,2-Tetrachloroethane	105	ug/L	20	21.0	71 - 121
Tetrachloroethene	106	ug/L	20	21.2	74 - 129
Toluene	104	ug/L	20	20.9	80 - 121
Total Xylenes	107	ug/L	60	64.0	79 - 121
1,2,3-Trichlorobenzene	89.7	ug/L	20	17.9	69 - 129
1,2,4-Trichlorobenzene	94	ug/L	20	18.8	69 - 130
1,1,1-Trichloroethane	116	ug/L	20	23.2	74 - 131
1,1,2-Trichloroethane	102	ug/L	20	20.4	80 - 119
Trichloroethene	101	ug/L	20	20.2	79 - 123
Trichlorofluoromethane	99.5	ug/L	20	19.9	65 - 141
Vinyl Chloride	97.6	ug/L	20	19.5	58 - 137
1,2-Dichloroethane-d4 (S)	98.2	%			81 - 118
4-Bromofluorobenzene (S)	108	%			85 - 114
Dibromofluoromethane (S)	99.3	%			80 - 119
Toluene-d8 (S)	97.7	%			89 - 112

QUALITY CONTROL DATA QUALIFIERS

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

QUALITY CONTROL PARAMETER QUALIFIERS

Lab ID	#	Sample Type	Analytical Method	Analyte
3017124	1	Lab Control Standard	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 190 and the control limits were 59 to 139.				
3017576	2	Lab Control Standard	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 181 and the control limits were 59 to 139.				
3017576	3	Lab Control Standard	SW846 8260C	1,1-Dichloroethene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,1-Dichloroethene. The % Recovery was reported as 135 and the control limits were 71 to 131.				
3017608	4	Matrix Spike	SW846 6020A	Calcium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
3017608	5	Matrix Spike	SW846 6020A	Sodium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3059231 EPR030|Willow Grove Sites 3 &

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3059231001	03TB02-20190918			SW846 8260C	VOMS/52440
3059231002	03DUP01-20190918			SW846 8260C	VOMS/52440
3059231003	03MW04SI-20190918			SW846 8260C	VOMS/52445
3059231004	03MW04S-20190918			SW846 8260C	VOMS/52445
3059231005	03MW07S-20190918			SW846 8260C	VOMS/52445
3059231006	03MW09IS-20190918			SW846 8260C	VOMS/52445
3059231007	03RB01-20190918			SW846 8260C	VOMS/52445
3059231002	03DUP01-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059231003	03MW04SI-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059231004	03MW04S-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059231005	03MW07S-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059231006	03MW09IS-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059231007	03RB01-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059231002	03DUP01-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059231003	03MW04SI-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059231004	03MW04S-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059231005	03MW07S-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059231006	03MW09IS-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059231007	03RB01-20190918	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059231002	03DUP01-20190918	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059231003	03MW04SI-20190918	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059231004	03MW04S-20190918	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059231005	03MW07S-20190918	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059231006	03MW09IS-20190918	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059231007	03RB01-20190918	SW846 7470A	MDIG/80082	SW846 7470A	META/70085

Monday, October 28, 2019 7:02:21 PM
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301 Fulling Mill Road
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC ALS

30592311

of 1 1

Client Name: Tetra Tech

Address: 234 Mall Boulevard Suite 260 King of Prussia PA 19406

Contact: Tricia Moore

Phone#: 610 392 1171

Project Name/#: Willow Grove Sites 3 and 12

Bill To: Tetra Tech Foster Plaza 7

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

Date Required: Approved?

Email? [ ] -Y

Fax? [ ] -Y No.:

W.O. Temp: 0°C Therm ID: 402

Analyst Initials: JDS

Courier/Tracking #:

Purchase Order #:

Project Comments:

ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment

Other:

	Container Type	VOA	Poly	Poly	Poly	Poly					
	Container Size	40ml	125ml	1Liter	1Liter	1Liter					
	Preservative	HCl	HNO_3	HNO_3	HNO_3	HNO_3					
		ANALYSES/METHOD REQUESTED									
		40ml VOA Vial VOC's	125ml Poly Metals + Hg	1 Liter Poly Uranium 238	1 Liter Poly Strontium-90	1 Liter Poly Radium 226					

	Sample Description/Location (as it will appear on the lab report)	Date Collected mm/dd/yy	Time hh:mm	*G or C	**Matrix	Enter Number of Containers Per Sample or Field Results Below.										Sample/COC Comments
1	03TB02-20190918	9/18/19	0900	G	AQ	2										
2	03DUP01-20190918	9/18/19	1200	G	GW	2	1	1	1	1						
3	03MW04SI-20190918	9/18/19	1230	G	GW	2	1	1	1	1						
4	03MW04S-20190918	9/18/19	1240	G	GW	2	1	1	1	1						
5	03MW07S-20190918	9/18/19	1500	G	GW	2	1	1	1	1						
6	03MW09I-20190918	9/18/19	1505	G	GW	2	1	1	1	1						
7	03RB01-20190918	9/18/19	1800	G	GW	2	1	1	1	1						
8																
9																
10																

SAMPLED BY (Please Print): Charles Meyer

Sampler Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Tetra Tech	9/19/19	1427	2 Chris Fidenza	9/19/19	1427
3 Chris Fidenza	9/19/19	1700	4		
5			6	9/19/19	2133
7			8		
9			10		

Data Deliverables: [✓] Standard [ ] CLP-like [ ] USACE/DOD

Special Processing: USACE [ ]

State Samples Collected In: [ ] NY [ ] NJ [✓] PA

Reportable to PADEP? Yes [ ] No [✓]

PWSID #

Sample Disposal: Lab [✓] Special [ ]

EDDS: Format Type-

other

* G=Grab; C=Composite

**Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS SHIPPING ADDRESS: 301 Fulling Mill Road, Middletown, PA 17057

Rev 04/19

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

Condition of Sample Receipt Form

Client: TETRA TECH | Work Order #: 3059231 | Initials: [illegible] | Date: 9/20/19

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

Cooler #: —

Temperature (°C): 0°C

Thermometer ID: 402

Radiological (µCi): _____

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

GW - not reportable. JBS/MS 9/20/19

Rev. 4/29/2019

Wednesday, October 23, 2019

Vanessa Badman
ALS Environmental
301 Fulling Mill Rd
Middletown, PA 17057

Re: ALS Workorder: 1909483
Project Name:
Project Number: 3059231

Dear Ms. Badman:

Six water samples were received from ALS Environmental, on 9/24/2019. The samples were scheduled for the following analyses:

Isotopic Uranium
Radium-226
Strontium-90

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Jeff R. Kujawa
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1909483

Radium-226:
The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

Strontium-90:
The samples were analyzed for the presence of ^{90}Sr according to the current revision of SOP 724.

All acceptance criteria were met.

Isotopic Uranium:
The samples were analyzed for the presence of isotopic uranium according to the current revision of SOP 714.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1909483
Client Name: ALS Environmental
Client Project Name:
Client Project Number: 3059231
Client PO Number: 3059231

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
3059231002	1909483-1		WATER	18-Sep-19	12:00
3059231003	1909483-2		WATER	18-Sep-19	12:30
3059231004	1909483-3		WATER	18-Sep-19	12:40
3059231005	1909483-4		WATER	18-Sep-19	15:00
3059231006	1909483-5		WATER	18-Sep-19	15:05
3059231007	1909483-6		WATER	18-Sep-19	18:00

Analytical Laboratory Services, Inc.
Environmental + Industrial Hygiene + Field Services
34 Dogwood Lane • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC #: 1909483 — 1 of 1
ALSI Quote #:

Client Name: ALS Environmental
Address: 34 Dogwood Lane, Middletown, PA 17057
Contact: Vanessa Badman
Phone#: (717) 944-5541
Project Name/#: E3280: 3029231
Bill To: ALS Environmental
TAT [ ] Normal-Standard TAT is 10-12 business days. [X] Rush-Subject to ALSI approval and surcharges.
Date Required: 9/30/2019 Approved By:
Email? [x] -Y ALMDTSUBCONTRACT@ALSGloba
Fax? [ ] -Y No.:

Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Container Type	Container Size	Preservative	Radium 226	Isotopic Ur-238	Strontium-90
					P	1L	HNO3	HNO3	HNO3	
1 3029231 002	9/18/19	1200	G	WT				1	1	1
2 3029231 003	9/18/19	1230	G	WT				1	1	1
3 3029231 004	9/18/19	1240	G	WT				1	1	1
4 3029231 005	9/18/19	1500	G	WT				1	1	1
5 3029231 006	9/18/19	1505	G	WT				1	1	1
6 3029231 007	9/18/19	1800	G	WT				1	1	1
7										
8										
9										
10										

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

Receipt Information (completed by Receiving Lab)
Cooler Temp: ____ Therm. ID: ____
No. of Coolers: ____

	Y	N	Initial
Custody Seals Present?			
(If present) Seals intact?			
Received on Ice?			
COC/Labels Complete/Accurate?			
Cont. in Good Cond.?			
Correct Containers?			
Correct Sample Volumes?			
Correct Preservation?			
Headspace/Volatiles?			

Courier Tracking #:

Sample/COC Comments
Subcontract: ALS Fort Collins

ALSI Field Services: ☐Pickup ☐Labor ☐Composite Sampling ☐Rental Equipment ☐Other:

Project Comments:

LOGGED BY(signature): DATE: / /
REVIEWED BY(signature): DATE: / /

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2		
3 ee	09-23-19	1525	4 Emily Lyons 09-24-19	10	25
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [X] CLP-like [X] DOD [X] Internal COC
Special Processing: USACE [ ] Navy [ ] DOD [X]
State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ] other
Reportable to PADEP? Yes [ ]
PWSID #:
Sample Disposal: Lab [X] Special [ ]
EDDs: Format Type- CUSTOM EDD, See e-mail.

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

Copies: WHITE - ORIGINAL CANARY - CUSTOMER MAILING PINK - FILE GOLDENROD - CUSTOMER COPY Rev 5/05

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS - PA Workorder No: 1909483

Project Manager: JRK Initials: Em Date: 09-24-19

1.	Are airbills / shipping documents present and/or removable?	DROP OFF	YES	NO
2.	Are custody seals on **shipping** containers intact?	NONE	YES	NO *
3.	Are custody seals on **sample** containers intact?	NONE	YES	NO *
4.	Is there a COC (chain-of-custody) present?		YES	NO *
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		YES	NO *
6.	Are short-hold samples present?		YES	NO
7.	Are all samples within holding times for the requested analyses?		YES	NO *
8.	Were all sample containers received intact? (not broken or leaking)		YES	NO *
9.	Is there sufficient sample for the requested analyses?		YES	NO *
10.	Are all samples in the proper containers for the requested analyses?		YES	NO *
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)	N/A	YES	NO *
12.	Are all aqueous non-preserved samples pH 4-9?	N/A	YES	NO *
13.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	N/A	YES	NO
14.	Were the samples shipped on ice?		YES	NO
15.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used* #1 #3 #4	RAD ONLY	YES	NO

Cooler #:	1	2							
Temperature (°C):	Amb.	Amb.							
No. of custody seals on cooler:	0	1							
DOT Survey Acceptance Information — External µR/hr reading:	12	12							
Background µR/hr reading:	13								

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

*** Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.**

All client bottle ID's vs ALS lab ID's double-checked by: Em

If applicable, was the client contacted? YES / NO / NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: 9-25-19

Form 201r27.xls
(02/11/2019)

*IR Gun #1, VWR SN 170560549
*IR Gun #3, VWR SN 170647571
*IR Gun #4, Oakton, SN 2372220101-0002

ORIGIN ID:MDTA (717) 944-5541
NEIL BROCIOUS
ALS GLOBAL
301 FULLING MILL ROAD
SUITE A
MIDDLETOWN, PA 17057
UNITED STATES US

SHIP DATE: 23SEP19
ACTWGT: 15.00 LB MAN
CAD: 0218589/CAFE3310

BILL THIRD PARTY

TO ATTN:SAMPLE RECEIVING
ALS FORT COLLINS
225 COMMERCE DR

FORT COLLINS CO 80524
(970) 490-1511
INV
PO: REF
DEPT

12-0
amb

555C160040542

FedEx Express

TUE - 24 SEP 3:00P
STANDARD OVERNIGHT

2 of 2
MPS# 0263 4798 9481 6045
Mstr# 4798 9481 6034

0201

80524
CO-US DEN

NA FTCA

After printing this label:
CONSIGNEE COPY - PLEASE PLACE IN FRONT OF POUCH
1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
CONSIGNEE COPY - PLEASE PLACE IN FRONT OF POUCH
1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

ORIGIN ID:MDTA (717) 944-5541
NEIL BROCIOUS
ALS GLOBAL
301 FULLING MILL ROAD
SUITE A
MIDDLETOWN, PA 17057
UNITED STATES US

SHIP DATE: 23SEP19
ACTWGT: 15.00 LB MAN
CAD: 0218589/CAFE3310

BILL THIRD PARTY

TO **ATTN:SAMPLE RECEIVING**
ALS FORT COLLINS
225 COMMERCE DR
FORT COLLINS CO 80524
(970) 490-1511
INV
PO
REF
DEPT

12-1
sms

565C1/9D04/05A2

FedEx Express

1 of 2
TRK# 0201 **4798 9481 6034**
MASTER

TUE - 24 SEP 3:00P
STANDARD OVERNIGHT

NA FTCA

80524
CO-US **DEN**

Client:	ALS Environmental	**Date:**	*23-Oct-19*
Project:	3059231	**Work Order:**	1909483
Sample ID:	3059231002	**Lab ID:**	1909483-1
Legal Location:		**Matrix:**	WATER
Collection Date:	9/18/2019 12:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	79		*30-110*	%REC	DL = NA	10/11/2019 13:07
U-238	ND (+/- 0.049)	U	0.08	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/15/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.2)	U	0.3	pCi/l	NA	10/22/2019 13:03
Carr: BARIUM	98.3		*40-110*	%REC	DL = NA	10/22/2019 13:03
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/14/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.28)	U	0.66	pCi/l	NA	10/18/2019 10:13
Carr: STRONTIUM	93.9		*40-110*	%REC	DL = NA	10/18/2019 10:13

Client: ALS Environmental **Date:** 23-Oct-19
Project: 3059231 **Work Order:** 1909483
Sample ID: 3059231003 **Lab ID:** 1909483-2
Legal Location: **Matrix:** WATER
Collection Date: 9/18/2019 12:30 **Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			SOP 714		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	69.7		30-110	%REC	DL = NA	10/14/2019 14:16
U-238	0.082 (+/- 0.075)		0.045	pCi/l	NA	10/14/2019 14:16
Radium-226 by Radon Emanation - Method 903.1			SOP 783		Prep Date: **10/15/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.14)	U	0.21	pCi/l	NA	10/22/2019 13:03
Carr: BARIUM	98.3		40-110	%REC	DL = NA	10/22/2019 13:03
Strontium-90 by GFPC			SOP 724		Prep Date: **10/14/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.29)	U	0.62	pCi/l	NA	10/18/2019 10:13
Carr: STRONTIUM	96.3		40-110	%REC	DL = NA	10/18/2019 10:13

Client:	ALS Environmental	**Date:**	*23-Oct-19*
Project:	3059231	**Work Order:**	1909483
Sample ID:	3059231004	**Lab ID:**	1909483-3
Legal Location:		**Matrix:**	WATER
Collection Date:	9/18/2019 12:40	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	75.9		*30-110*	%REC	DL = NA	10/11/2019 13:07
U-238	0.167 (+/- 0.089)		0.075	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/15/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.18)	U	0.3	pCi/l	NA	10/22/2019 13:03
Carr: BARIUM	99.9		*40-110*	%REC	DL = NA	10/22/2019 13:03
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/14/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.3)	U	0.61	pCi/l	NA	10/18/2019 10:13
Carr: STRONTIUM	90.2		*40-110*	%REC	DL = NA	10/18/2019 10:13

Client:	ALS Environmental	**Date:**	*23-Oct-19*
Project:	3059231	**Work Order:**	1909483
Sample ID:	3059231005	**Lab ID:**	1909483-4
Legal Location:		**Matrix:**	WATER
Collection Date:	9/18/2019 15:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	90.9		*30-110*	%REC	DL = NA	10/11/2019 13:07
U-238	0.94 (+/- 0.24)		0.05	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/15/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.23)	Y1,U	0.31	pCi/l	NA	10/22/2019 13:03
Carr: BARIUM	*100*	Y1	*40-110*	%REC	DL = NA	10/22/2019 13:03
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/14/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.29)	U	0.68	pCi/l	NA	10/18/2019 10:13
Carr: STRONTIUM	93.9		*40-110*	%REC	DL = NA	10/18/2019 10:13

Client:	ALS Environmental	**Date:**	*23-Oct-19*
Project:	3059231	**Work Order:**	1909483
Sample ID:	3059231006	**Lab ID:**	1909483-5
Legal Location:		**Matrix:**	WATER
Collection Date:	9/18/2019 15:05	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	73.7		*30-110*	%REC	DL = NA	10/11/2019 13:07
U-238	0.134 (+/- 0.08)		0.067	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/15/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.21)	U	0.36	pCi/l	NA	10/22/2019 13:03
Carr: BARIUM	99.7		*40-110*	%REC	DL = NA	10/22/2019 13:03
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/14/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.28)	U	0.6	pCi/l	NA	10/18/2019 10:13
Carr: STRONTIUM	98		*40-110*	%REC	DL = NA	10/18/2019 10:13

Client:	ALS Environmental	**Date:**	*23-Oct-19*
Project:	3059231	**Work Order:**	1909483
Sample ID:	3059231007	**Lab ID:**	1909483-6
Legal Location:		**Matrix:**	WATER
Collection Date:	9/18/2019 18:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy		**SOP 714**			Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	*75.2*		*30-110*	*%REC*	DL = NA	10/11/2019 13:07
U-238	ND (+/- 0.036)	U	0.065	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**			Prep Date: **10/15/2019**	PrepBy: **JXH**
Ra-226	ND (+/- 0.33)	Y1,U	0.44	pCi/l	NA	10/22/2019 13:03
Carr: BARIUM	*101*	Y1	*40-110*	*%REC*	DL = NA	10/22/2019 13:03
Strontium-90 by GFPC		**SOP 724**			Prep Date: **10/14/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.3)	U	0.69	pCi/l	NA	10/18/2019 10:13
Carr: STRONTIUM	*82.6*		*40-110*	*%REC*	DL = NA	10/18/2019 10:13

Client:	ALS Environmental	**Date:**	23-Oct-19
Project:	3059231	**Work Order:**	1909483
Sample ID:	3059231007	**Lab ID:**	1909483-6
Legal Location:		**Matrix:**	WATER
Collection Date:	9/18/2019 18:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

- "Report Limit" is the MDC
U or ND - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110 %. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
G - Sample density differs by more than 15 % of LCS density.
D - DER is greater than Control Limit
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
NC - Not Calculated for duplicate results less than 5 times MDC
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
U or ND - Indicates that the compound was analyzed for but not detected.
E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
M - Duplicate injection precision was not met.
N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
* - Duplicate analysis (relative percent difference) not within control limits.
S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.
B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
E - Analyte concentration exceeds the upper level of the calibration range.
J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
A - A tentatively identified compound is a suspected aldol-condensation product.
X - The analyte was diluted below an accurate quantitation level.
* - The spike recovery is equal to or outside the control criteria used.
+ - The relative percent difference (RPD) equals or exceeds the control criteria.
G - A pattern resembling gasoline was detected in this sample
D - A pattern resembling diesel was detected in this sample.
M - A pattern resembling motor oil was detected in this sample.
C - A pattern resembling crude oil was detected in this sample.
4 - A pattern resembling JP-4 was detected in this sample.
5 - A pattern resembling JP-5 was detected in this sample.
H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: RE191015-1-2 Instrument ID: Alpha Scin Method: Radium-226 by Radon Emanation

LCS Sample ID: RE191015-1 Units: pCi/l Analysis Date: 10/23/2019 12:55
Client ID: Run ID: RE191015-1A Prep Date: 10/15/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	368 (+/-97)	0.4	46.47		83.4	67-120					P
Carr: BARIUM	18200		18330		99.3	40-110					

LCSD Sample ID: RE191015-1 Units: pCi/l Analysis Date: 10/23/2019 12:55
Client ID: Run ID: RE191015-1A Prep Date: 10/15/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	51 (+/-13)	0	46.47		109	67-120		38.8	0.7	2.1	P
Carr: BARIUM	18020		18350		98.2	40-110		18200			

MB Sample ID: RE191015-1 Units: pCi/l Analysis Date: 10/23/2019 12:39
Client ID: Run ID: RE191015-1A Prep Date: 10/15/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.19									Y1,U
Carr: BARIUM	18560		18340		101	40-110					Y1

The following samples were analyzed in this batch:

1909483-1	1909483-2	1909483-3
1909483-4	1909483-5	1909483-6

Client: ALS Environmental
Work Order: 1909483
Project: 3059231

QC BATCH REPORT

Batch ID: AS191008-2-1 Instrument ID: AlphaSpec2 Method: Isotopic Uranium by Alpha Spec

DUP Sample ID: 1909483-2 Units: pCi/l Analysis Date: 10/14/2019 14:16
Client ID: 3059231003 Run ID: AS191008-2UD Prep Date: 10/8/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-238	ND	0.111						0.082	0.1	2.1	U
Tracer: U-232	14.5	0.2	22.88		63.3	30-110		15.7			

LCS Sample ID: AS191008-2 Units: pCi/l Analysis Date: 10/10/2019 12:43
Client ID: Run ID: AS191008-2UD Prep Date: 10/8/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-234	4.79 (+/-0.86)	0.04	4.22		113	82-122					P
U-238	4.68 (+/-0.84)	0.05	4.382		107	78-126					P
Tracer: U-232	3.13	0.08	4.576		68.4	30-110					

MB Sample ID: AS191008-2 Units: pCi/l Analysis Date: 10/14/2019 14:16
Client ID: Run ID: AS191008-2UD Prep Date: 10/8/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-238	ND	0.028									U
Tracer: U-232	3.34	0.04	4.575		72.9	30-110					

The following samples were analyzed in this batch:

1909483-1	1909483-2	1909483-3
1909483-4	1909483-5	1909483-6

Client: ALS Environmental
Work Order: 1909483
Project: 3059231

QC BATCH REPORT

Batch ID: SR191014-1-1 Instrument ID: LB4100-C Method: Strontium-90 by GFPC

LCS Sample ID: SR191014-1 Units: pCi/l Analysis Date: 10/18/2019 11:58
Client ID: Run ID: SR191014-1A Prep Date: 10/14/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	11.9 (+/-3.1)	1.1	11.54		103	75-125					P,M3
Carr: STRONTIUM	987.3		1052		93.9	40-110					

LCSD Sample ID: SR191014-1 Units: pCi/l Analysis Date: 10/18/2019 11:58
Client ID: Run ID: SR191014-1A Prep Date: 10/14/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	12.9 (+/-3.3)	1.2	11.54		112	75-125		11.9	0.2	2.1	P,M3
Carr: STRONTIUM	937.8		1052		89.2	40-110		987.3			

MB Sample ID: SR191014-1 Units: pCi/l Analysis Date: 10/18/2019 10:13
Client ID: Run ID: SR191014-1A Prep Date: 10/14/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	ND	0.68									U
Carr: STRONTIUM	924.7		1052		87.9	40-110					

The following samples were analyzed in this batch:

1909483-1	1909483-2	1909483-3
1909483-4	1909483-5	1909483-6

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

October 28, 2019

Ms. Tricia Moore
Tetra Tech Inc

Certificate of Analysis

Project Name:	**Form Naval Air Station JRB/Willow Grove**	Workorder:	**3059275**
Purchase Order:		Workorder ID:	**EPR031|Willow Grove Sites 3 &**

Dear Ms. Moore:

Enclosed are the analytical results for samples received by the laboratory between Wednesday, September 18, 2019 and Saturday, September 21, 2019.

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 Mrs. Vanessa N Badman (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.

CC: Ms. Amy Thompson , Mr. Rick Carr , Ms. Megan Ritchie

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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October 28, 2019

Ms. Tricia Moore
Tetra Tech Inc

Certificate of Analysis

Project Name:	**Form Naval Air Station JRB/Willow Grove**	Workorder:	**3059275**
Purchase Order:		Workorder ID:	**EPR031|Willow Grove Sites 3 &**

Dear Ms. Moore:

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

CC: Ms. Amy Thompson , Mr. Rick Carr , Ms. Megan Ritchie

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

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental

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SAMPLE SUMMARY

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3059275001	03TB04-20190920	Water	9/20/2019 07:00	9/21/2019 09:27	Collected by Client
3059275002	03MW03SI-20190920	Water	9/20/2019 10:20	9/21/2019 09:27	Collected by Client
3059275003	03MW03I-20190920	Water	9/20/2019 12:25	9/21/2019 09:27	Collected by Client
3059275004	03MW04I-20190920	Water	9/20/2019 15:15	9/21/2019 09:27	Collected by Client
3059275005	03DUP02-20190920	Water	9/20/2019 12:00	9/21/2019 09:27	Collected by Client

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SAMPLE SUMMARY

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

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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PROJECT SUMMARY

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Workorder Comments

Please see attached subcontracting from ALS Ft. Collins. VNB 9/23/19

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275001** Date Collected: 9/20/2019 07:00 Matrix: Water

Sample ID: **03TB04-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 17:38	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 17:38	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 17:38	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,4-Dioxane	62.5U	U,2	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 17:38	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 17:38	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A

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ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275001** Date Collected: 9/20/2019 07:00 Matrix: Water

Sample ID: **03TB04-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 17:38	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C		9/27/19 17:38	TMP	A
1,2,3-Trichlorobenzene	0.75U	U,1	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 17:38	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	106		%	81 - 118	SW846 8260C		9/27/19 17:38	TMP	A
4-Bromofluorobenzene (S)	112		%	85 - 114	SW846 8260C		9/27/19 17:38	TMP	A
Dibromofluoromethane (S)	101		%	80 - 119	SW846 8260C		9/27/19 17:38	TMP	A
Toluene-d8 (S)	101		%	89 - 112	SW846 8260C		9/27/19 17:38	TMP	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275002** Date Collected: 9/20/2019 10:20 Matrix: Water

Sample ID: **03MW03SI-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 20:38	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 20:38	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 20:38	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 20:38	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 20:38	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 20:38	TMP	A

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275002** Date Collected: 9/20/2019 10:20 Matrix: Water

Sample ID: **03MW03SI-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 20:38	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
Tetrachloroethene	7.2		ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 20:38	TMP	A
1,2,3-Trichlorobenzene	0.75U	U,2	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 20:38	TMP	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118			SW846 8260C			9/27/19 20:38	TMP	A
4-Bromofluorobenzene (S)	112		%	85 - 114			SW846 8260C			9/27/19 20:38	TMP	A
Dibromofluoromethane (S)	98.5		%	80 - 119			SW846 8260C			9/27/19 20:38	TMP	A
Toluene-d8 (S)	99		%	89 - 112			SW846 8260C			9/27/19 20:38	TMP	A
METALS												
Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 02:08	LXC	C
Barium, Total	0.30		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:08	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Calcium, Total	22.5		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Chromium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Copper, Total	0.0039J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:08	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 02:08	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Magnesium, Total	9.2		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 15:02	AHI	C
Nickel, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275002** Date Collected: 9/20/2019 10:20 Matrix: Water

Sample ID: **03MW03SI-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	0.59		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:08	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Sodium, Total	9.1		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Vanadium, Total	0.0018J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:06	LXC	C
Zinc, Total	0.0050J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:08	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/20/19 10:20	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275003** Date Collected: 9/20/2019 12:25 Matrix: Water

Sample ID: **03MW03I-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:01	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:01	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 21:01	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
cis-1,2-Dichloroethene	0.52J	J	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 21:01	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:01	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:01	TMP	A

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275003** Date Collected: 9/20/2019 12:25 Matrix: Water
Sample ID: **03MW03I-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 21:01	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
Tetrachloroethene	1.4		ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 21:01	TMP	A
1,2,3-Trichlorobenzene	0.75U	U,2	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:01	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118	SW846 8260C			9/27/19 21:01	TMP	A
4-Bromofluorobenzene (S)	114		%	85 - 114	SW846 8260C			9/27/19 21:01	TMP	A
Dibromofluoromethane (S)	101		%	80 - 119	SW846 8260C			9/27/19 21:01	TMP	A
Toluene-d8 (S)	99.6		%	89 - 112	SW846 8260C			9/27/19 21:01	TMP	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Arsenic, Total	0.0021J	J	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 02:11	LXC	C
Barium, Total	0.25		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:11	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Calcium, Total	28.0		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Chromium, Total	0.00079J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Copper, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:11	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 02:11	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Magnesium, Total	15.5		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 15:03	AHI	C
Nickel, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C

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ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275003** Date Collected: 9/20/2019 12:25 Matrix: Water

Sample ID: **03MW03I-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	1.4		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:11	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Sodium, Total	8.4		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Vanadium, Total	0.0019J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:10	LXC	C
Zinc, Total	0.0032J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:11	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/20/19 12:25	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275004** Date Collected: 9/20/2019 15:15 Matrix: Water

Sample ID: **03MW04I-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:23	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:23	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 21:23	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 21:23	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:23	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:23	TMP	A

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ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275004** Date Collected: 9/20/2019 15:15 Matrix: Water

Sample ID: **03MW04I-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 21:23	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 21:23	TMP	A
1,2,3-Trichlorobenzene	0.75U	U,2	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:23	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	104		%	81 - 118	SW846 8260C			9/27/19 21:23	TMP	A
4-Bromofluorobenzene (S)	114		%	85 - 114	SW846 8260C			9/27/19 21:23	TMP	A
Dibromofluoromethane (S)	98.3		%	80 - 119	SW846 8260C			9/27/19 21:23	TMP	A
Toluene-d8 (S)	99.4		%	89 - 112	SW846 8260C			9/27/19 21:23	TMP	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 02:14	LXC	C
Barium, Total	0.43		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:14	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Calcium, Total	35.5		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Chromium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Copper, Total	0.0046J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:14	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 02:14	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Magnesium, Total	10.9		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 15:04	AHI	C
Nickel, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C

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ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275004** Date Collected: 9/20/2019 15:15 Matrix: Water

Sample ID: **03MW04I-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	0.81		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Selenium, Total	0.0019J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:14	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Sodium, Total	15.6		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Thallium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Vanadium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:13	LXC	C
Zinc, Total	0.0056J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:14	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/20/19 15:15	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275005** Date Collected: 9/20/2019 12:00 Matrix: Water

Sample ID: **03DUP02-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*
VOLATILE ORGANICS											
Acetone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:46	TMP	A
Benzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Bromochloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Bromodichloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Bromoform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Bromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
2-Butanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:46	TMP	A
Carbon Disulfide	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Chlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Chlorodibromomethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Chloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Chloroform	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Chloromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,2-Dibromo-3-chloropropane	2.5U	U	ug/L	5.0	2.5	1.6	SW846 8260C		9/27/19 21:46	TMP	A
1,2-Dibromoethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,2-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,3-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,4-Dichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Dichlorodifluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,2-Dichloropropane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
cis-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
trans-1,3-Dichloropropene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
1,4-Dioxane	62.5U	U,1	ug/L	125	62.5	41.6	SW846 8260C		9/27/19 21:46	TMP	A
Ethylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Freon 113	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
2-Hexanone	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C		9/27/19 21:46	TMP	A
Isopropylbenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Methyl acetate	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A
Methyl cyclohexane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		9/27/19 21:46	TMP	A

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ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275005** Date Collected: 9/20/2019 12:00 Matrix: Water

Sample ID: **03DUP02-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
Methyl t-Butyl Ether	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
4-Methyl-2-Pentanone(MIBK)	3.8U	U	ug/L	5.0	3.8	1.6	SW846 8260C			9/27/19 21:46	TMP	A
Methylene Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
Styrene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
Tetrachloroethene	7.3		ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
Total Xylenes	2.3U	U	ug/L	3.0	2.3	1.0	SW846 8260C			9/27/19 21:46	TMP	A
1,2,3-Trichlorobenzene	0.75U	U,2	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
1,2,4-Trichlorobenzene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
Trichlorofluoromethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			9/27/19 21:46	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118	SW846 8260C			9/27/19 21:46	TMP	A
4-Bromofluorobenzene (S)	113		%	85 - 114	SW846 8260C			9/27/19 21:46	TMP	A
Dibromofluoromethane (S)	98.4		%	80 - 119	SW846 8260C			9/27/19 21:46	TMP	A
Toluene-d8 (S)	99		%	89 - 112	SW846 8260C			9/27/19 21:46	TMP	A

METALS

Aluminum, Total	0.059U	U	mg/L	0.089	0.059	0.030	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Antimony, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Arsenic, Total	0.0020U	U	mg/L	0.0030	0.0020	0.0010	SW846 6020A	9/25/19	SXC	9/27/19 02:18	LXC	C
Barium, Total	0.30		mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:18	LXC	C
Beryllium, Total	0.00070U	U	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Cadmium, Total	0.00070U	U	mg/L	0.0011	0.00070	0.00037	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Calcium, Total	22.2		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Chromium, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Cobalt, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Copper, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:18	LXC	C
Iron, Total	0.037U	U	mg/L	0.056	0.037	0.019	SW846 6020A	9/25/19	SXC	9/27/19 02:18	LXC	C
Lead, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Magnesium, Total	9.1		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Manganese, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Mercury, Total	0.00033U	U	mg/L	0.00050	0.00033	0.00016	SW846 7470A	9/26/19	AHI	9/26/19 15:06	AHI	C
Nickel, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID: **3059275005** Date Collected: 9/20/2019 12:00 Matrix: Water

Sample ID: **03DUP02-20190920** Date Received: 9/21/2019 09:27

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
Potassium, Total	0.58		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Selenium, Total	0.0037U	U	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:18	LXC	C
Silver, Total	0.0015U	U	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Sodium, Total	8.8		mg/L	0.11	0.073	0.037	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Thallium, Total	0.00040J	J	mg/L	0.0010	0.00070	0.00030	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Vanadium, Total	0.0018J	J	mg/L	0.0022	0.0015	0.00074	SW846 6020A	9/25/19	SXC	9/26/19 05:30	LXC	C
Zinc, Total	0.0031J	J	mg/L	0.0056	0.0037	0.0019	SW846 6020A	9/25/19	SXC	9/27/19 02:18	LXC	C
SUBCONTRACTED ANALYSIS												
Subcontracted Analysis	See attached.						Subcontract			9/20/19 12:00	SUB	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3059275001	1	03TB04-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				
3059275001	2	03TB04-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275002	1	03MW03SI-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275002	2	03MW03SI-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				
3059275003	1	03MW03I-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275003	2	03MW03I-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				
3059275004	1	03MW04I-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275004	2	03MW04I-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				
3059275005	1	03DUP02-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275005	2	03DUP02-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID	Sample ID	Analysis Method	Prep Method
3059275001	03TB04-20190920	SW846 8260C	
3059275002	03MW03SI-20190920	SW846 6020A	SW846 3015
3059275002	03MW03SI-20190920	SW846 7470A	SW846 7470A
3059275002	03MW03SI-20190920	SW846 8260C	
3059275002	03MW03SI-20190920	Subcontract	
3059275003	03MW03I-20190920	SW846 6020A	SW846 3015
3059275003	03MW03I-20190920	SW846 7470A	SW846 7470A
3059275003	03MW03I-20190920	SW846 8260C	
3059275003	03MW03I-20190920	Subcontract	
3059275004	03MW04I-20190920	SW846 6020A	SW846 3015
3059275004	03MW04I-20190920	SW846 7470A	SW846 7470A
3059275004	03MW04I-20190920	SW846 8260C	
3059275004	03MW04I-20190920	Subcontract	
3059275005	03DUP02-20190920	SW846 6020A	SW846 3015
3059275005	03DUP02-20190920	SW846 7470A	SW846 7470A
3059275005	03DUP02-20190920	SW846 8260C	
3059275005	03DUP02-20190920	Subcontract	

QUALITY CONTROL DATA

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

QC Batch: MDIG/80070 **Analysis Method:** SW846 6020A

QC Batch Method: SW846 3015

Associated Lab Samples: 3059275002, 3059275003, 3059275004, 3059275005

METHOD BLANK: 3017605

Parameter	Blank Result	Units	Reporting Limit
Aluminum, Total	0.059U	mg/L	0.089
Antimony, Total	0.0015U	mg/L	0.0022
Arsenic, Total	0.0020U	mg/L	0.0030
Barium, Total	0.0037U	mg/L	0.0056
Beryllium, Total	0.00070U	mg/L	0.0010
Cadmium, Total	0.00070U	mg/L	0.0011
Calcium, Total	0.073U	mg/L	0.11
Chromium, Total	0.0015U	mg/L	0.0022
Cobalt, Total	0.0037U	mg/L	0.0056
Copper, Total	0.0028J	mg/L	0.0056
Iron, Total	0.037U	mg/L	0.056
Lead, Total	0.0015U	mg/L	0.0022
Magnesium, Total	0.073U	mg/L	0.11
Manganese, Total	0.0037U	mg/L	0.0056
Nickel, Total	0.0037U	mg/L	0.0056
Potassium, Total	0.073U	mg/L	0.11
Selenium, Total	0.0037U	mg/L	0.0056
Silver, Total	0.0015U	mg/L	0.0022
Sodium, Total	0.073U	mg/L	0.11
Thallium, Total	0.00070U	mg/L	0.0010
Vanadium, Total	0.0015U	mg/L	0.0022
Zinc, Total	0.0031J	mg/L	0.0056

LABORATORY CONTROL SAMPLE: 3017606

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Aluminum, Total	94.5	mg/L	2.2	2.1	84 - 117
Antimony, Total	98.3	mg/L	.22	0.22	85 - 117
Arsenic, Total	105	mg/L	.22	0.23	84 - 116
Barium, Total	99.8	mg/L	2.2	2.2	86 - 114
Beryllium, Total	99.2	mg/L	.22	0.22	83 - 121
Cadmium, Total	98.7	mg/L	.22	0.22	87 - 115
Calcium, Total	102	mg/L	2.2	2.3	87 - 118
Chromium, Total	100	mg/L	.22	0.22	85 - 116
Cobalt, Total	98.5	mg/L	.22	0.22	86 - 115

QUALITY CONTROL DATA

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Copper, Total	98.6	mg/L	.22	0.22	85 - 118
Iron, Total	102	mg/L	2.2	2.3	87 - 118
Lead, Total	103	mg/L	.22	0.23	88 - 115
Magnesium, Total	101	mg/L	2.2	2.2	83 - 118
Manganese, Total	102	mg/L	.22	0.23	87 - 115
Nickel, Total	103	mg/L	.22	0.23	85 - 117
Potassium, Total	103	mg/L	2.2	2.3	87 - 115
Selenium, Total	100	mg/L	.22	0.22	80 - 120
Silver, Total	97.4	mg/L	.11	0.11	85 - 116
Sodium, Total	103	mg/L	2.2	2.3	85 - 117
Thallium, Total	103	mg/L	.22	0.23	82 - 116
Vanadium, Total	101	mg/L	.22	0.22	86 - 115
Zinc, Total	96.9	mg/L	.22	0.22	83 - 119

MATRIX SPIKE: 3017608 DUPLICATE: 3017609 ORIGINAL: 3058771003

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Aluminum, Total	.02406	mg/L	2.2	2.08114	2.14493	92.6	95.4	84 - 117	3.02	20
Antimony, Total	.00009	mg/L	.22	.21528	.22283	96.8	100	85 - 117	3.44	20
Arsenic, Total	.00019	mg/L	.22	.22429	.22136	101	99.5	84 - 116	1.32	20
Barium, Total	.10991	mg/L	2.2	2.25289	2.35671	96.4	101	86 - 114	4.5	20
Beryllium, Total	.00022	mg/L	.22	.21539	.22482	96.8	101	83 - 121	4.29	20
Cadmium, Total	.00011	mg/L	.22	.21628	.22309	97.3	100	87 - 115	3.1	20
Calcium, Total	10.74566	mg/L	2.2	11.97273	12.18293	NC	NC	87 - 118	1.74	20
Chromium, Total	.00471	mg/L	.22	.22427	.23362	98.8	103	85 - 116	4.08	20
Cobalt, Total	.00018	mg/L	.22	.21125	.22053	95	99.2	86 - 115	4.3	20
Copper, Total	.0022	mg/L	.22	.2118	.21901	94.3	97.6	85 - 118	3.35	20
Iron, Total	.03999	mg/L	2.2	2.25523	2.25535	99.7	99.7	87 - 118	.005	20
Lead, Total	.00016	mg/L	.22	.22284	.23101	100	104	88 - 115	3.6	20
Magnesium, Total	3.68396	mg/L	2.2	5.52743	5.60593	83	86.5	83 - 115	1.41	20
Manganese, Total	.00391	mg/L	.22	.22357	.23917	98.8	106	87 - 115	6.74	20
Nickel, Total	.00494	mg/L	.22	.22331	.23105	98.3	102	85 - 117	3.41	20
Potassium, Total	1.1033	mg/L	2.2	3.30413	3.34037	99	101	87 - 115	1.09	20
Selenium, Total	.00121	mg/L	.22	.21713	.21328	97.2	95.4	80 - 120	1.79	20
Silver, Total	.00003	mg/L	.11	.10576	.10982	95.2	98.8	85 - 116	3.77	20
Sodium, Total	11.24693	mg/L	2.2	12.20283	12.22909	NC	NC	85 - 117	.21	20
Thallium, Total	.00002	mg/L	.22	.22098	.23205	99.4	104	82 - 116	4.88	20
Vanadium, Total	.00008	mg/L	.22	.21971	.23093	98.8	104	86 - 115	4.98	20
Zinc, Total	.00384	mg/L	.22	.21058	.2188	93	96.7	83 - 119	3.83	20

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QUALITY CONTROL DATA

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

QC Batch: MDIG/80082 **Analysis Method:** SW846 7470A

QC Batch Method: SW846 7470A

Associated Lab Samples: 3059275002, 3059275003, 3059275004, 3059275005

METHOD BLANK: 3017954

Parameter	Blank Result	Units	Reporting Limit
Mercury, Total	0.00033U	mg/L	0.00050

LABORATORY CONTROL SAMPLE: 3017956

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Mercury, Total	88.5	mg/L	.002	0.0018	82 - 119

QUALITY CONTROL DATA

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

QC Batch: VOMS/52473 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3059275001, 3059275002, 3059275003, 3059275004, 3059275005

METHOD BLANK: 3018649

Parameter	Blank Result	Units	Reporting Limit
Acetone	3.8U	ug/L	5.0
Benzene	0.75U	ug/L	1.0
Bromochloromethane	0.75U	ug/L	1.0
Bromodichloromethane	0.75U	ug/L	1.0
Bromoform	0.75U	ug/L	1.0
Bromomethane	0.75U	ug/L	1.0
2-Butanone	3.8U	ug/L	5.0
Carbon Disulfide	0.75U	ug/L	1.0
Carbon Tetrachloride	0.75U	ug/L	1.0
Chlorobenzene	0.75U	ug/L	1.0
Chlorodibromomethane	0.75U	ug/L	1.0
Chloroethane	0.75U	ug/L	1.0
Chloroform	0.75U	ug/L	1.0
Chloromethane	0.75U	ug/L	1.0
Cyclohexane	0.75U	ug/L	1.0
1,2-Dibromo-3-chloropropane	2.5U	ug/L	5.0
1,2-Dibromoethane	0.75U	ug/L	1.0
1,2-Dichlorobenzene	0.75U	ug/L	1.0
1,3-Dichlorobenzene	0.75U	ug/L	1.0
1,4-Dichlorobenzene	0.75U	ug/L	1.0
Dichlorodifluoromethane	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloropropane	0.75U	ug/L	1.0
cis-1,3-Dichloropropene	0.75U	ug/L	1.0
trans-1,3-Dichloropropene	0.75U	ug/L	1.0
1,4-Dioxane	73.7J	ug/L	125
Ethylbenzene	0.75U	ug/L	1.0
Freon 113	0.75U	ug/L	1.0
2-Hexanone	3.8U	ug/L	5.0
Isopropylbenzene	0.75U	ug/L	1.0
Methyl acetate	0.75U	ug/L	1.0
Methyl cyclohexane	0.75U	ug/L	1.0
Methyl t-Butyl Ether	0.75U	ug/L	1.0

QUALITY CONTROL DATA

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

4-Methyl-2-Pentanone(MIBK)	3.8U	ug/L	5.0
Methylene Chloride	0.75U	ug/L	1.0
Styrene	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
Total Xylenes	2.3U	ug/L	3.0
1,2,3-Trichlorobenzene	0.75U	ug/L	1.0
1,2,4-Trichlorobenzene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Trichlorofluoromethane	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	104	%	81 - 118
4-Bromofluorobenzene (S)	111	%	85 - 114
Dibromofluoromethane (S)	100	%	80 - 119
Toluene-d8 (S)	100	%	89 - 112

LABORATORY CONTROL SAMPLE: 3018650

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Acetone	105	ug/L	100	105	39 - 160
Benzene	105	ug/L	20	20.9	79 - 120
Bromochloromethane	105	ug/L	20	21.0	78 - 123
Bromodichloromethane	107	ug/L	20	21.4	79 - 125
Bromoform	101	ug/L	20	20.3	66 - 130
Bromomethane	86.6	ug/L	20	17.3	53 - 141
2-Butanone	89.2	ug/L	100	89.2	56 - 143
Carbon Disulfide	104	ug/L	20	20.9	64 - 133
Carbon Tetrachloride	110	ug/L	20	22.0	72 - 136
Chlorobenzene	98.4	ug/L	20	19.7	82 - 118
Chlorodibromomethane	103	ug/L	20	20.5	74 - 126
Chloroethane	101	ug/L	20	20.2	60 - 138
Chloroform	102	ug/L	20	20.4	79 - 124
Chloromethane	97.6	ug/L	20	19.5	50 - 139
Cyclohexane	110	ug/L	20	21.9	71 - 130
1,2-Dibromo-3-chloropropane	85.5	ug/L	20	17.1	62 - 128
1,2-Dibromoethane	101	ug/L	20	20.2	77 - 121
1,2-Dichlorobenzene	99.4	ug/L	20	19.9	80 - 119
1,3-Dichlorobenzene	99.6	ug/L	20	19.9	80 - 119
1,4-Dichlorobenzene	96.9	ug/L	20	19.4	79 - 118
Dichlorodifluoromethane	93.5	ug/L	20	18.7	32 - 152

QUALITY CONTROL DATA

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

1,1-Dichloroethane	113	ug/L	20	22.7	77 - 125
1,2-Dichloroethane	104	ug/L	20	20.8	73 - 128
1,1-Dichloroethene	129	ug/L	20	25.9	71 - 131
cis-1,2-Dichloroethene	103	ug/L	20	20.6	78 - 123
trans-1,2-Dichloroethene	119	ug/L	20	23.7	75 - 124
1,2-Dichloropropane	105	ug/L	20	20.9	78 - 122
cis-1,3-Dichloropropene	104	ug/L	20	20.8	75 - 124
trans-1,3-Dichloropropene	105	ug/L	20	21.0	73 - 127
1,4-Dioxane	318*	ug/L	500	1590	59 - 139
Ethylbenzene	98	ug/L	20	19.6	79 - 121
Freon 113	98.7	ug/L	20	19.7	70 - 136
2-Hexanone	86	ug/L	100	86.0	57 - 139
Isopropylbenzene	108	ug/L	20	21.6	72 - 131
Methyl acetate	108	ug/L	20	21.5	56 - 136
Methyl cyclohexane	107	ug/L	20	21.3	72 - 132
Methyl t-Butyl Ether	106	ug/L	20	21.1	71 - 124
4-Methyl-2-Pentanone(MIBK)	81.8	ug/L	100	81.8	67 - 130
Methylene Chloride	111	ug/L	20	22.2	74 - 124
Styrene	105	ug/L	20	21.0	78 - 123
1,1,2,2-Tetrachloroethane	96.6	ug/L	20	19.3	71 - 121
Tetrachloroethene	103	ug/L	20	20.5	74 - 129
Toluene	101	ug/L	20	20.3	80 - 121
Total Xylenes	103	ug/L	60	61.8	79 - 121
1,2,3-Trichlorobenzene	64.8*	ug/L	20	13.0	69 - 129
1,2,4-Trichlorobenzene	78.3	ug/L	20	15.7	69 - 130
1,1,1-Trichloroethane	111	ug/L	20	22.3	74 - 131
1,1,2-Trichloroethane	98.3	ug/L	20	19.7	80 - 119
Trichloroethene	98.1	ug/L	20	19.6	79 - 123
Trichlorofluoromethane	103	ug/L	20	20.5	65 - 141
Vinyl Chloride	101	ug/L	20	20.3	58 - 137
1,2-Dichloroethane-d4 (S)	104	%			81 - 118
4-Bromofluorobenzene (S)	109	%			85 - 114
Dibromofluoromethane (S)	98.9	%			80 - 119
Toluene-d8 (S)	98	%			89 - 112

QUALITY CONTROL DATA QUALIFIERS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

QUALITY CONTROL PARAMETER QUALIFIERS

Lab ID	#	Sample Type	Analytical Method	Analyte
3017608	1	Matrix Spike	SW846 6020A	Calcium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
3017608	2	Matrix Spike	SW846 6020A	Sodium, Total
The concentration of this analyte was greater than 4 times the concentration of the spike added to the matrix spike. According to protocol, the calculation for percent recovery of the matrix spike is not valid.				
3018649	3	Method Blank	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3018650	4	Lab Control Standard	SW846 8260C	1,4-Dioxane
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,4-Dioxane. The % Recovery was reported as 318 and the control limits were 59 to 139.				
3018650	5	Lab Control Standard	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3059275002	03MW03SI-20190920	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059275003	03MW03I-20190920	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059275004	03MW04I-20190920	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059275005	03DUP02-20190920	SW846 3015	MDIG/80070	SW846 6020A	META/70077
3059275002	03MW03SI-20190920	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059275003	03MW03I-20190920	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059275004	03MW04I-20190920	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059275005	03DUP02-20190920	SW846 3015	MDIG/80070	SW846 6020A	META/70102
3059275002	03MW03SI-20190920	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059275003	03MW03I-20190920	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059275004	03MW04I-20190920	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059275005	03DUP02-20190920	SW846 7470A	MDIG/80082	SW846 7470A	META/70085
3059275001	03TB04-20190920			SW846 8260C	VOMS/52473
3059275002	03MW03SI-20190920			SW846 8260C	VOMS/52473
3059275003	03MW03I-20190920			SW846 8260C	VOMS/52473
3059275004	03MW04I-20190920			SW846 8260C	VOMS/52473
3059275005	03DUP02-20190920			SW846 8260C	VOMS/52473

Monday, October 28, 2019 7:03:46 PM
Page 30 of 47

301 Fulling Mill Road
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC ALS [of]

* 3059275 *

Client Name: Tetra Tech
Address: 234 Mall Boulevard Suite 260
King of Prussia, PA 19406
Contact: Trisha Moore
Phone#: 610 382 1171
Project Name/#: Willow Grove Sites 3 and 12
Bill To: Tetra Tech Foster Plaza 7

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

W.O. Temp: 3 Therm ID:
Analyst Initials:
Courier/Tracking #:
Purchase Order #:
Project Comments:

ALS Field Services: □ Pickup □ Labor □ Composite Sampling □ Rental Equipment
Other:

	Container Type	40ml vial	Poly	Poly	Poly	Poly					
	Container Size	40ml	125ml	1Liter	1Liter	1Liter					
	Preservative	HCl	HNO_3	HNO_3	HNO_3	HNO_3					
	ANALYSES/METHOD REQUESTED										
	*G or C	**Matrix	40ml VOA vial VOC's 8260 list	125ml poly Metals and Hg	1 Liter Poly Radium 226	1 Liter Poly Uranium 238	1 Liter Poly Strontium 90				
	Enter Number of Containers Per Sample or Field Results Below.										

	Sample Description/Location (as it will appear on the lab report)	Date Collected mm/dd/yy	Time hh:mm	*G or C	**Matrix	40ml VOA vial VOC's 8260 list	125ml poly Metals and Hg	1 Liter Poly Radium 226	1 Liter Poly Uranium 238	1 Liter Poly Strontium 90	Sample/COC Comments
1	03TB04-20190920	9/20/19	0700	G	~~AQ~~ WQ	2					
2	03MW03SI-20190920	9/20/19	1020	G	GW	2	1	1	1	1	
3	03MW03I-20190920	9/20/19	1225	G	GW	2	1	1	1	1	
4	03MW04I-20190920	9/20/19	1515	G	GW	2	1	1	1	1	
5	03DUP02-20190920	9/20/19	1200	G	GW	2	1	1	1	1	
6	~~ABOZ-20190920~~	~~9/20/19~~		G	~~AQ~~						CM 9/20/19
7											
8											
9											
10											

SAMPLED BY (Please Print): Charles Mayer

Sampler Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Charles Mayer Tetra Tech	9/20/19	1900	2 FedEx		
3 FedEx			4 Kathy Jessup	9/21/19	0927
5			6		
7			8		
9			10		

Data Deliverables: [✓] Standard [ ] CLP-like [ ] USACE/DOD

Special Processing: USACE [ ]

State Samples Collected In: [ ] NY [ ] NJ [✓] PA

Reportable to PADEP? Yes [ ] No [✓]
PWSID #

Sample Disposal: Lab [✓] Special [ ]

EDDS: Format Type-

other

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

ALS SHIPPING ADDRESS: 301 Fulling Mill Road, Middletown, PA 17057

Rev 04/19

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

Condition of Sample Receipt Form

Client: Tetra Tech | Work Order #: 3059275 | Initials: CLS | Date: 9/21

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 7763 0176 6008			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: ____

Temperature (°C): 3

Thermometer ID: 403

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

Rev. 1/10/2019

Thursday, October 24, 2019

Vanessa Badman
ALS Environmental
301 Fulling Mill Rd
Middletown, PA 17057

Re: ALS Workorder: 1909484
Project Name:
Project Number: 3059275

Dear Ms. Badman:

Four water samples were received from ALS Environmental, on 9/24/2019. The samples were scheduled for the following analyses:

Isotopic Uranium
Radium-226
Strontium-90

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Jeff R. Kujawa
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1909484

Radium-226:

The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

Strontium-90:

The samples were analyzed for the presence of ^{90}Sr according to the current revision of SOP 724.

All acceptance criteria were met.

Isotopic Uranium:

The samples were analyzed for the presence of isotopic uranium according to the current revision of SOP 714.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1909484
Client Name: ALS Environmental
Client Project Name:
Client Project Number: 3059275
Client PO Number: 3059275

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
3059275002	1909484-1		WATER	20-Sep-19	10:20
3059275003	1909484-2		WATER	20-Sep-19	12:25
3059275004	1909484-3		WATER	20-Sep-19	15:15
3059275005	1909484-4		WATER	20-Sep-19	12:00

Analytical Laboratory Services, Inc.
Environmental • Industrial Hygiene • Field Services
34 Dogwood Lane • Middletown, PA 17057 • 717.944.5541 • Fax: 717.944.1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC #: 1909484 — 1 of 1
ALSI Quote #:

Client Name: ALS Environmental
Address: 34 Dogwood Lane, Middletown, PA 17057
Contact: Vanessa Badman
Phone#: (717) 944-5541
Project Name/#: E3280: 3059275
Bill To: ALS Environmental

TAT: [ ] Normal-Standard TAT is 10-12 business days. [X] Rush-Subject to ALSI approval and surcharges.
Date Required: 10/1/2019 Approved By:
Email? [X] -Y ALMDTSUBCONTRACT@ALSGloba
Fax? [ ] -Y No.:

	Container Type	P	P	P								
	Container Size	1 L	1L	1L								
	Preservative	HNO3	HNO3	HNO3								
	ANALYSES/METHOD REQUESTED											
Sample Description/Location (as it will appear on the lab report)	Sample Date	Time	*G or C	**Matrix	Radium 226	Isotopic Ur-238	Strontium-90					
					Enter Number of Containers Per Sample or Field Results Below.							
1 3059275 002	9/20/19	1020	G	WT	1	1	1					
2 3059275 003	9/20/19	1225	G	WT	1	1	1					
3 3059275 004	9/20/19	1515	G	WT	1	1	1					
4 3059275 005	9/20/19	1200	G	WT	1	1	1					
5												
6												
7												
8												
9												
10												

Receipt Information (completed by Receiving Lab)
Cooler Temp: ____ Therm. ID: ____
No. of Coolers: ____ Y N Initial
Custody Seals Present? [ ] [ ]
(If present) Seals Intact? [ ] [ ]
Received on Ice? [ ] [ ]
COC/Labels Complete/Accurate? [ ] [ ]
Cont. in Good Cond.? [ ] [ ]
Correct Containers? [ ] [ ]
Correct Sample Volumes? [ ] [ ]
Correct Preservation? [ ] [ ]
Headspace/Volatiles? [ ] [ ]
Courier Tracking #: ____

Sample/COC Comments
Subcontract: ALS Fort Collins

ALSI Field Services: ☐Pickup ☐Labor ☐Composite Sampling ☐Rental Equipment ☐Other:

Project Comments:

LOGGED BY(signature): Date: Time:
REVIEWED BY(signature): Date: Time:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1			2		
3 el	09.23.19	1520	4 Emily Yous 09.24.19		1025
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [X] CLP-like [X] DOD [X] Internal COC
Special Processing: USACE [ ] Navy [ ] DOD [X]
State Samples Collected In: [ ] NY [ ] NJ [X] PA [ ] NC [ ] other
Reportable to PADEP? Yes [ ]
PWSID #
Sample Disposal: Lab [X] Special [ ]
EDDs: Format Type: CUSTOM EDD, See e-mail.

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

Copies: WHITE - ORIGINAL CANARY - CUSTOMER MAILING PINK - FILE GOLDENROD - CUSTOMER COPY Rev 5/05

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS - PA Workorder No: 1909484

Project Manager: JRK Initials: Em Date: 09.24.19

1.	Are airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
2.	Are custody seals on **shipping** containers intact?	NONE	(YES)	NO *
3.	Are custody seals on **sample** containers intact?	(NONE)	YES	NO *
4.	Is there a COC (chain-of-custody) present?		(YES)	NO *
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		(YES)	NO *
6.	Are short-hold samples present?		YES	(NO)
7.	Are all samples within holding times for the requested analyses?		(YES)	NO *
8.	Were all sample containers received intact? (not broken or leaking)		(YES)	NO *
9.	Is there sufficient sample for the requested analyses?		(YES)	NO *
10.	Are all samples in the proper containers for the requested analyses?		(YES)	NO *
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)	N/A	(YES)	NO *
12.	Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO *
13.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	(N/A)	YES	NO
14.	Were the samples shipped on ice?		YES	(NO)
15.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #1 #3 #4	(RAD ONLY)	YES	NO

Cooler #:	1	2						
Temperature (°C):	Amb.	Amb.						
No. of custody seals on cooler:	Ø	1						
DOT Survey/ Acceptance Information — External µR/hr reading:	12	12						
Background µR/hr reading:	13							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / NA (If no, see Form 008.)

*** Please provide details here for NO responses to gray boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.**

All client bottle ID's vs ALS lab ID's double-checked by: Em

If applicable, was the client contacted? YES / NO / (NA) Contact: _____ Date/Time: _____

Project Manager Signature / Date: [signature] 9-25-19

Form 201r27.xls
(02/11/2019)

*IR Gun #1, VWR SN 170560549
*IR Gun #3, VWR SN 170647571
*IR Gun #4, Oakton, SN 2372220101-0002

ALS

ORIGIN ID:MDTA (717) 944-5541
NEIL BROCIOUS
ALS GLOBAL
301 FULLING MILL ROAD
SUITE A
MIDDLETOWN, PA 17057
UNITED STATES US

SHIP DATE: 23SEP19
ACTWGT: 15.00 LB MAN
CAD: 0218589/CAFE3310

BILL THIRD PARTY

TO ATTN:SAMPLE RECEIVING
ALS FORT COLLINS
225 COMMERCE DR

FORT COLLINS CO 80524
(970) 490-1511
INV:
PO:
REF:
DEPT:

12-0
amb

565C1900/05A2

FedEx Express

2 of 2
MPS# 0263 4798 9481 6045
Mstr# 4798 9481 6034

TUE - 24 SEP 3:00P
STANDARD OVERNIGHT

0201

NA FTCA

80524
CO-US DEN

After printing this label:
~~CONSIGNEE COPY - PLEASE PLACE IN FRONT OF POUCH~~
1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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2. Place label in shipping pouch and affix it to your shipment.

ORIGIN ID:MDTA (717) 944-5541
NEIL BROCIOUS
ALS GLOBAL
301 FULLING MILL ROAD
SUITE A
MIDDLETOWN, PA 17057
UNITED STATES US

SHIP DATE: 23SEP19
ACTWGT: 15.00 LB MAN
CAD: 02186589/CAFE3310

BILL THIRD PARTY

TO ATTN:SAMPLE RECEIVING
ALS FORT COLLINS
225 COMMERCE DR
FORT COLLINS CO 80524
(970) 490-1511

REF
INV:
PO:
DEPT:

565C1/6D04/05A2

FedEx Express

1 of 2
TRK# 0201 4798 9481 6034
MASTER

TUE - 24 SEP 3:00P
STANDARD OVERNIGHT

NA FTCA

80524
CO-US DEN

Client:	ALS Environmental	**Date:**	24-Oct-19
Project:	3059275	**Work Order:**	1909484
Sample ID:	3059275002	**Lab ID:**	1909484-1
Legal Location:		**Matrix:**	WATER
Collection Date:	9/20/2019 10:20	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	79.9		*30-110*	%REC	DL = NA	10/11/2019 13:07
U-238	ND (+/- 0.056)	U	0.072	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/3/2019**	PrepBy: **TRW**
Ra-226	ND (+/- 0.22)	U	0.38	pCi/l	NA	10/9/2019 13:25
Carr: BARIUM	99.8		*40-110*	%REC	DL = NA	10/9/2019 13:25
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/17/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.28)	U	0.69	pCi/l	NA	10/22/2019 07:54
Carr: STRONTIUM	91.9		*40-110*	%REC	DL = NA	10/22/2019 07:54

Client:	ALS Environmental	**Date:**	24-Oct-19
Project:	3059275	**Work Order:**	1909484
Sample ID:	3059275003	**Lab ID:**	1909484-2
Legal Location:		**Matrix:**	WATER
Collection Date:	9/20/2019 12:25	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	59.3		30-110	%REC	DL = NA	10/11/2019 13:07
U-238	ND (+/- 0.13)	U,M	0.21	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/3/2019**	PrepBy: **TRW**
Ra-226	ND (+/- 0.2)	U	0.31	pCi/l	NA	10/9/2019 13:25
Carr: BARIUM	99.1		40-110	%REC	DL = NA	10/9/2019 13:25
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/17/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.38)	U	0.84	pCi/l	NA	10/22/2019 07:43
Carr: STRONTIUM	99.9		40-110	%REC	DL = NA	10/22/2019 07:43

Client:	ALS Environmental	**Date:**	24-Oct-19
Project:	3059275	**Work Order:**	1909484
Sample ID:	3059275004	**Lab ID:**	1909484-3
Legal Location:		**Matrix:**	WATER
Collection Date:	9/20/2019 15:15	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			**SOP 714**		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	57.9		30-110	%REC	DL = NA	10/11/2019 13:07
U-238	0.128 (+/- 0.09)		0.097	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1			**SOP 783**		Prep Date: **10/3/2019**	PrepBy: **TRW**
Ra-226	ND (+/- 0.24)	Y1,U	0.48	pCi/l	NA	10/9/2019 13:25
Carr: BARIUM	101	Y1	40-110	%REC	DL = NA	10/9/2019 13:25
Strontium-90 by GFPC			**SOP 724**		Prep Date: **10/17/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.31)	U	0.72	pCi/l	NA	10/22/2019 07:54
Carr: STRONTIUM	91.3		40-110	%REC	DL = NA	10/22/2019 07:54

Client: ALS Environmental **Date:** 24-Oct-19
Project: 3059275 **Work Order:** 1909484
Sample ID: 3059275005 **Lab ID:** 1909484-4
Legal Location: **Matrix:** WATER
Collection Date: 9/20/2019 12:00 **Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Isotopic Uranium by Alpha Spectroscopy			SOP 714		Prep Date: **10/8/2019**	PrepBy: **AHJ**
Tracer: U-232	*72.2*		*30-110*	*%REC*	DL = NA	10/11/2019 13:07
U-238	0.119 (+/- 0.078)		0.085	pCi/l	NA	10/11/2019 13:07
Radium-226 by Radon Emanation - Method 903.1			SOP 783		Prep Date: **10/3/2019**	PrepBy: **TRW**
Ra-226	1.61 (+/- 0.62)	Y1	0.37	pCi/l	NA	10/9/2019 13:41
Carr: BARIUM	*100*	Y1	*40-110*	*%REC*	DL = NA	10/9/2019 13:41
Strontium-90 by GFPC			SOP 724		Prep Date: **10/17/2019**	PrepBy: **JXH**
Sr-90	ND (+/- 0.27)	U	0.7	pCi/l	NA	10/22/2019 07:54
Carr: STRONTIUM	*94.3*		*40-110*	*%REC*	DL = NA	10/22/2019 07:54

Client:	ALS Environmental	**Date:**	24-Oct-19
Project:	3059275	**Work Order:**	1909484
Sample ID:	3059275005	**Lab ID:**	1909484-4
Legal Location:		**Matrix:**	WATER
Collection Date:	9/20/2019 12:00	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

- "Report Limit" is the MDC
U or ND - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110 %. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
# - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
G - Sample density differs by more than 15 % of LCS density.
D - DER is greater than Control Limit
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits
NC - Not Calculated for duplicate results less than 5 times MDC
B - Analyte concentration greater than MDC.
B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
U or ND - Indicates that the compound was analyzed for but not detected.
E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
M - Duplicate injection precision was not met.
N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
* - Duplicate analysis (relative percent difference) not within control limits.
S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.
B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
E - Analyte concentration exceeds the upper level of the calibration range.
J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
A - A tentatively identified compound is a suspected aldol-condensation product.
X - The analyte was diluted below an accurate quantitation level.
* - The spike recovery is equal to or outside the control criteria used.
+ - The relative percent difference (RPD) equals or exceeds the control criteria.
G - A pattern resembling gasoline was detected in this sample
D - A pattern resembling diesel was detected in this sample.
M - A pattern resembling motor oil was detected in this sample.
C - A pattern resembling crude oil was detected in this sample.
4 - A pattern resembling JP-4 was detected in this sample.
5 - A pattern resembling JP-5 was detected in this sample.
H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

Batch ID: RE191003-1-3 Instrument ID: Alpha Scin Method: Radium-226 by Radon Emanation

LCS Sample ID: RE191003-1 Units: pCi/l Analysis Date: 10/9/2019 13:41

Client ID: Run ID: RE191003-1A Prep Date: 10/3/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	49 (+/-12)	1	46.47		105	67-120					P,Y1,M3
Carr: BARIUM	16420		16260		101	40-110					Y1

MB Sample ID: RE191003-1 Units: pCi/l Analysis Date: 10/9/2019 13:41

Client ID: Run ID: RE191003-1A Prep Date: 10/3/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.6									Y1,U
Carr: BARIUM	16480		16270		101	40-110					Y1

The following samples were analyzed in this batch:

1909484-1	1909278-1	1909484-2
1909484-3	1909484-4	

Client: ALS Environmental
Work Order: 1909484
Project: 3059275

QC BATCH REPORT

Batch ID: AS191008-2-1 Instrument ID: AlphaSpec2 Method: Isotopic Uranium by Alpha Spec

DUP Sample ID: 1909484-2 Units: pCi/l Analysis Date: 10/11/2019 13:07
Client ID: 3059275003 Run ID: AS191008-2UD Prep Date: 10/8/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-238	0.25 (+/-0.19)	0.21						0.1	0.7	2.1	M3
Tracer: U-232	14.7	0.3	22.88		64.4	30-110		13.6			

LCS Sample ID: AS191008-2 Units: pCi/l Analysis Date: 10/10/2019 12:43
Client ID: Run ID: AS191008-2UD Prep Date: 10/8/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-234	4.79 (+/-0.86)	0.04	4.22		113	82-122					P
U-238	4.68 (+/-0.84)	0.05	4.382		107	78-126					P
Tracer: U-232	3.13	0.08	4.576		68.4	30-110					

MB Sample ID: AS191008-2 Units: pCi/l Analysis Date: 10/14/2019 14:16
Client ID: Run ID: AS191008-2UD Prep Date: 10/8/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
U-238	ND	0.028									U
Tracer: U-232	3.34	0.04	4.575		72.9	30-110					

The following samples were analyzed in this batch: 1909484-1 1909484-2 1909484-3 1909484-4

Client: ALS Environmental
Work Order: 1909484
Project: 3059275

QC BATCH REPORT

Batch ID: SR191017-1-2 Instrument ID: LB4100-C Method: Strontium-90 by GFPC

DUP Sample ID: 1909484-2 Units: pCi/l Analysis Date: 10/22/2019 07:43
Client ID: 3059275003 Run ID: SR191017-1A Prep Date: 10/17/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	ND	0.89						-0.21	0.1	2.1	U
Carr: STRONTIUM	934.7		1076		86.9	40-110		948.2			

LCS Sample ID: SR191017-1 Units: pCi/l Analysis Date: 10/22/2019 08:50
Client ID: Run ID: SR191017-1A Prep Date: 10/17/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	12 (+/-3)	0.8	11.54		104	75-125					P
Carr: STRONTIUM	905.2		1040		87	40-110					

MB Sample ID: SR191017-1 Units: pCi/l Analysis Date: 10/22/2019 07:43
Client ID: Run ID: SR191017-1A Prep Date: 10/17/2019 DF: NA

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Sr-90	ND	0.37									U
Carr: STRONTIUM	930.8		1040		89.5	40-110					

The following samples were analyzed in this batch: 1909484-1 1909484-2 1909484-3 1909484-4

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APPENDIX D
DATA VALIDATION REPORTS
(INCLUDED ON CD ONLY)

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TETRA TECH

INTERNAL CORRESPONDENCE

TO: **T. MOORE** **DATE:** **DECEMBER 17, 2019**

FROM: **J. KALINYAK** **COPIES:** **DV FILE**

SUBJECT: **DATA VALIDATION – VOC, METALS**
WILLOW GROVE NAS JRB
SAMPLE DELIVERY GROUP (SDG) EPR-029

SAMPLES: **7 / Aqueous – VOC**

03MW02I-20190917	03MW02S-20190917	03MW02SI-20190917
03MW03S-20190916	03MW06S-20190917	03MW06SI-20190917
TB-01-20190916		

6 / Aqueous – Metals

03MW02I-20190917	03MW02S-20190917	03MW02SI-20190917
03MW03S-20190916	03MW06S-20190917	03MW06SI-20190917

Overview

The sample set for Willow Grove NAS JRB, SDG EPR-029, consisted of six (6) aqueous samples and one (1) aqueous Trip Blank (TB) sample. All aqueous samples were analyzed for Volatile Organic Compounds (VOCs). The six (6) aqueous samples were also analyzed for total metals including mercury, as listed above. No field duplicate sample pairs were associated with this SDG.

The samples were collected by Tetra Tech on September 16 and 17, 2019 and analyzed by ALS Environmental for all analyses listed above. All analyses were conducted in accordance with EPA SW-846 Methods 8260C for VOCs, 6020A (ICP/MS) for total metals, and 7470A for mercury, analytical and reporting protocols.

The data contained in this SDG was validated at a EPA Stage Level 2B with regard to the following parameters: data completeness, holding times, initial & continuing calibration results, blank results, laboratory control sample (LCS)/LCS duplicate (LCSD) recoveries, matrix spike (MS)/MS duplicate (MSD) recoveries, surrogate spike recoveries, internal standard recoveries, chromatographic resolution, ICP interference results, ICP serial dilution results, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major Problems

No major problems were identified.

Minor Problems

- Detected results reported below the quantitation limit but above the method detection limit (MDL) were qualified as estimated, (J).

- For the VOC analysis, the MS percent recoveries (%Rs) were less than the quality control (QC) limits for 1,4-dioxane and 1,2,3-trichlorobenzene and the MSD %R for 1,4-dioxane was greater than the QC limit for spiked sample 03MW06SI-20190917. Additionally, the MS/MSD %R relative percent difference (RPD) was greater than the 30% QC limit for 1,4-dioxane for the spiked sample. The sample 03MW06SI-20190917 had non-detected 1,4-dioxane and 1,2,3-trichlorobenzene results which were qualified estimated, (UJ).

- For the VOC fraction, the surrogate %Rs for 4-bromofluorobenzene (BFB) were greater than the QC limits for samples 03MW02S-20190917, 03MW02SI-20190917, and 03MW06S-20190917. The aforementioned sample detected VOC results were qualified estimated high, (J+), except when also qualified for another QC issue in which case they were qualified estimated, (J). The sample non-detected VOC results were not qualified.

- For the metals fraction, metals were detected in the continuing calibration blank (CCB) and method blank affecting all metal analysis samples at the following maximum concentrations listed below.

Analyte	Maximum Concentration	Limit of Quantitation (LOQ) > or <
Thallium (1)	0.0005 mg/l	<LOQ
Copper (2)	0.00282 mg/l	<LOQ
Zinc (2)	0.00308 mg/l	<LOQ

(1) Maximum concentration detected in a CCB on 09/26/3019 @ 04:39 affecting all metal analysis samples.
(2) Maximum concentration detected in method blank for batch 544196 affecting all metal analysis samples.

All samples had non-detected thallium results which were not qualified. The samples 03MW02S-20190917, 03MW06S-20190917, and 03MW06SI-20190917 had detected copper results reported <LOQ and were qualified as non-detected, (U). The remainder of the samples had either non-detected copper results or copper results >LOQ and were not qualified. The samples 03MW02S-20190917, 03MW02SI-20190917, 03MW03S-20190916, and 03MW06SI-20190917 had zinc results <LOQ which were qualified non-detected, (U). The remainder of the samples had zinc results>LOQ and were not qualified.

Notes

Non-detected sample analyte results were reported to the Limit of Detection (LOD).

For the VOC analysis, the method blank MB 3015410 had a detection for 1,4-dioxane @ 99.5 µg/l, >LOQ. No action was taken as all samples had non-detected 1,4-dioxane results.

For the VOC fraction, the LCS 3017124 had a %R for 1,4-dioxane that was greater than the QC limits affecting VOC samples 03MW02I-20190917, 03MW02S-20190917, and 03MW02SI-20190917. The aforementioned samples had non-detected results for 1,4-dioxane which were not qualified.

For the VOC analysis, the MS and MSD percent recoveries (%Rs) were greater than the quality control (QC) limits for 1,1-dichloroethene, and the MS %R was greater than the QC limit for trans-1,2-dichloroethene for spiked sample 03MW06SI-20190917. No action was taken the sample had non-detected 1,1-dichloroethene and trans-1,2-dichloroethene results.

For the metals analysis, an interference check had an internal standard %Rs above the QC limit. No action was taken for this issue and it is noted for completeness only.

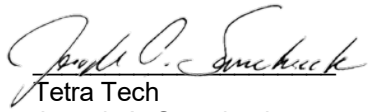
EXECUTIVE SUMMARY

Laboratory Performance Issues: Sample VOC results were qualified for surrogate %Rs greater than the QC limits. Sample copper and zinc results were qualified non-detected for method blank contamination.

Other Factors Affecting Data Quality: Detected results reported below the quantitation limit but above the MDL were qualified as estimated, (J). Sample VOC results were qualified for MS/MSD %R results outside the QC limits.

The data for these analyses were reviewed with reference to the USEPA National Functional Guidelines for Superfund Organic Methods Data Review (January 2017) and USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (January 2017).

Tetra Tech
Joseph Kalinyak
Data Validator/Environmental Scientist



Tetra Tech
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	03MW02I-20190917			03MW02S-20190917			03MW02SI-20190917			03MW03S-20190916		
SDG: EPR-029	LAB_ID	3058771006			3058771005			3058771007			3058771002		
FRACTION: OV	SAMP_DATE	9/17/2019			9/17/2019			9/17/2019			9/16/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1,2,2-TETRACHLOROETHANE		0.98	J	P	0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.33	J	P	0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2,3-TRICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2,4-TRICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2-DIBROMOETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROPROPANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,3-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,4-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,4-DIOXANE		62.5	U		62.5	U		62.5	U		62.5	U	
2-BUTANONE		3.8	U		3.8	U		3.8	U		3.8	U	
2-HEXANONE		3.8	U		3.8	U		3.8	U		3.8	U	
4-METHYL-2-PENTANONE		3.8	U		3.8	U		3.8	U		3.8	U	
ACETONE		7.8			3.5	J	PR	3.8	U		3.8	U	
BENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOCHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMODICHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOFORM		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CARBON DISULFIDE		0.75	U		0.75	U		0.75	U		0.75	U	
CARBON TETRACHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLORODIBROMOMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROFORM		3			0.75	U		0.75	U		0.75	U	
CHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CIS-1,2-DICHLOROETHENE		1.8			0.75	U		0.75	U		0.75	U	
CIS-1,3-DICHLOROPROPENE		0.75	U		0.75	U		0.75	U		0.75	U	
CYCLOHEXANE		0.75	U		0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03MW06S-20190917			03MW06SI-20190917			TB-01-20190916		
SDG: EPR-029	LAB_ID	3058771004			3058771003			3058771001		
FRACTION: OV	SAMP_DATE	9/17/2019			9/17/2019			9/16/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									

PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1,2,2-TETRACHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHENE	0.75	U		0.75	U		0.75	U	
1,2,3-TRICHLOROBENZENE	0.75	U		0.75	UJ	D	0.75	U	
1,2,4-TRICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,2-DIBROMO-3-CHLOROPROPANE	2.5	U		2.5	U		2.5	U	
1,2-DIBROMOETHANE	0.75	U		0.75	U		0.75	U	
1,2-DICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,2-DICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,2-DICHLOROPROPANE	0.75	U		0.75	U		0.75	U	
1,3-DICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,4-DICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,4-DIOXANE	62.5	U		62.5	UJ	D	100	U	
2-BUTANONE	3.8	U		3.8	U		3.8	U	
2-HEXANONE	3.8	U		3.8	U		3.8	U	
4-METHYL-2-PENTANONE	3.8	U		3.8	U		3.8	U	
ACETONE	3.8	U		3.8	U		3.8	U	
BENZENE	0.75	U		0.75	U		0.75	U	
BROMOCHLOROMETHANE	0.75	U		0.75	U		0.75	U	
BROMODICHLOROMETHANE	0.75	U		0.75	U		0.75	U	
BROMOFORM	0.75	U		0.75	U		0.75	U	
BROMOMETHANE	0.75	U		0.75	U		0.75	U	
CARBON DISULFIDE	0.75	U		0.75	U		0.75	U	
CARBON TETRACHLORIDE	0.75	U		0.75	U		0.75	U	
CHLOROBENZENE	0.75	U		0.75	U		0.75	U	
CHLORODIBROMOMETHANE	0.75	U		0.75	U		0.75	U	
CHLOROETHANE	0.75	U		0.75	U		0.75	U	
CHLOROFORM	0.75	U		0.75	U		0.75	U	
CHLOROMETHANE	0.75	U		0.75	U		0.75	U	
CIS-1,2-DICHLOROETHENE	0.75	U		0.75	U		0.75	U	
CIS-1,3-DICHLOROPROPENE	0.75	U		0.75	U		0.75	U	
CYCLOHEXANE	0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03MW02I-20190917			03MW02S-20190917			03MW02SI-20190917			03MW03S-20190916		
SDG: EPR-029	LAB_ID	3058771006			3058771005			3058771007			3058771002		
FRACTION: OV	SAMP_DATE	9/17/2019			9/17/2019			9/17/2019			9/16/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLORODIFLUOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
ETHYLBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
ISOPROPYLBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
METHYL ACETATE		0.75	U		0.75	U		0.75	U		0.75	U	
METHYL CYCLOHEXANE		0.75	U		0.75	U		0.75	U		0.75	U	
METHYL TERT-BUTYL ETHER		0.75	U		0.75	U		0.75	U		0.75	U	
METHYLENE CHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	
STYRENE		0.75	U		0.75	U		0.75	U		0.75	U	
TETRACHLOROETHENE		0.75	U		1.2	J+	R	0.75	U		3.1		
TOLUENE		0.75	U		0.75	U		0.75	U		0.75	U	
TOTAL XYLENES		2.3	U		2.3	U		2.3	U		2.3	U	
TRANS-1,2-DICHLOROETHENE		0.75	U		0.75	U		0.75	U		0.75	U	
TRANS-1,3-DICHLOROPROPENE		0.75	U		0.75	U		0.75	U		0.75	U	
TRICHLOROETHENE		0.75	U		0.75	U		0.75	U		0.75	U	
TRICHLOROFLUOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
VINYL CHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03MW06S-20190917			03MW06SI-20190917			TB-01-20190916		
SDG: EPR-029	LAB_ID	3058771004			3058771003			3058771001		
FRACTION: OV	SAMP_DATE	9/17/2019			9/17/2019			9/16/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									

PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLORODIFLUOROMETHANE	0.75	U		0.75	U		0.75	U	
ETHYLBENZENE	0.75	U		0.75	U		0.75	U	
ISOPROPYLBENZENE	0.75	U		0.75	U		0.75	U	
METHYL ACETATE	0.75	U		0.75	U		0.75	U	
METHYL CYCLOHEXANE	0.75	U		0.75	U		0.75	U	
METHYL TERT-BUTYL ETHER	0.75	U		0.75	U		0.75	U	
METHYLENE CHLORIDE	0.75	U		0.75	U		0.75	U	
STYRENE	0.75	U		0.75	U		0.75	U	
TETRACHLOROETHENE	0.47	J	PR	0.75	U		0.75	U	
TOLUENE	0.75	U		0.75	U		0.75	U	
TOTAL XYLENES	2.3	U		2.3	U		2.3	U	
TRANS-1,2-DICHLOROETHENE	0.75	U		0.75	U		0.75	U	
TRANS-1,3-DICHLOROPROPENE	0.75	U		0.75	U		0.75	U	
TRICHLOROETHENE	0.75	U		0.75	U		0.75	U	
TRICHLOROFLUOROMETHANE	0.75	U		0.75	U		0.75	U	
VINYL CHLORIDE	0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03MW02I-20190917			03MW02S-20190917			03MW02SI-20190917			03MW03S-20190916		
SDG: EPR-029	LAB_ID	3058771006			3058771005			3058771007			3058771002		
FRACTION: M	SAMP_DATE	9/17/2019			9/17/2019			9/17/2019			9/16/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALUMINUM		0.14			0.059	U		0.059	U		0.059	U	
ANTIMONY		0.0015	U		0.0015	U		0.0015	U		0.0015	U	
ARSENIC		0.0015	J	P	0.002	U		0.002	U		0.001	J	P
BARIUM		0.32			0.1			0.32			0.16		
BERYLLIUM		0.0007	U		0.0007	U		0.0007	U		0.0007	U	
CADMIUM		0.0007	U		0.0007	U		0.0007	U		0.0007	U	
CALCIUM		22.2			8.5			24.9			18.8		
CHROMIUM		0.0066			0.0029			0.0022			0.001	J	P
COBALT		0.0037	U		0.0037	U		0.0037	U		0.0037	U	
COPPER		0.023			0.0028	U	A	0.0037	U		0.0037	U	
IRON		0.5			0.037	U		0.037	U		0.44		
LEAD		0.0018	J	P	0.0015	U		0.0015	U		0.0015	U	
MAGNESIUM		10.5			3.9			12.8			7.1		
MANGANESE		0.057			0.0037	U		0.0037	U		0.027		
MERCURY		0.00033	U		0.00033	U		0.00033	U		0.00033	U	
NICKEL		0.005	J	P	0.0025	J	P	0.0037	U		0.0037	U	
POTASSIUM		0.81			1.1			0.77			1		
SELENIUM		0.0037	U		0.0037	U		0.0037	U		0.0037	U	
SILVER		0.0015	U		0.0015	U		0.0015	U		0.0015	U	
SODIUM		8.1			7.6			11.5			8.9		
THALLIUM		0.0007	U		0.0007	U		0.0007	U		0.0007	U	
VANADIUM		0.0024			0.0015	U		0.002	J	P	0.0013	J	P
ZINC		0.047			0.0045	U	A	0.0023	U	A	0.0043	U	A

PROJ_NO: 08005-WE04	NSAMPLE	03MW06S-20190917			03MW06SI-20190917		
SDG: EPR-029	LAB_ID	3058771004			3058771003		
FRACTION: M	SAMP_DATE	9/17/2019			9/17/2019		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALUMINUM		0.047	J	P	0.059	U	
ANTIMONY		0.0015	U		0.0015	U	
ARSENIC		0.002	U		0.002	U	
BARIUM		0.036			0.11		
BERYLLIUM		0.0007	U		0.0007	U	
CADMIUM		0.0007	U		0.0007	U	
CALCIUM		10.4			10.7		
CHROMIUM		0.004			0.0047		
COBALT		0.0037	U		0.0037	U	
COPPER		0.0045	U	A	0.0022	U	A
IRON		0.078			0.04	J	P
LEAD		0.0015	U		0.0015	U	
MAGNESIUM		5.6			3.7		
MANGANESE		0.0058			0.0039	J	P
MERCURY		0.00033	U		0.00033	U	
NICKEL		0.0042	J	P	0.0049	J	P
POTASSIUM		1.4			1.1		
SELENIUM		0.0041	J	P	0.0037	U	
SILVER		0.0015	U		0.0015	U	
SODIUM		10.9			11.2		
THALLIUM		0.0007	U		0.0007	U	
VANADIUM		0.0015	U		0.0015	U	
ZINC		0.0062			0.0038	U	A

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

TB-01-20190916

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092316.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	100	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

TB-01-20190916

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092316.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW03S-20190916

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092320.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW03S-20190916

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092320.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	3.1	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW06SI-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092321.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW06SI-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092321.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW06S-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092322.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW06S-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092322.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.47	J
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW02S-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092571.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.5	J
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW02S-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092571.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	1.2	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW02I-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771006

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092572.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	7.8	
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	3.0	
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	1.8	
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.33	J
591-78-6	2-Hexanone	3.8	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW02I-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771006

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092572.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.98	J
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW02SI-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771007

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092573.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW02SI-20190917

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771007

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092573.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 6020 3015 DOD

Sample ID: 3058771002 **Client ID:** 03MW03S-20190916

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	04:09:53
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:09:53
Arsenic	7440-38-2	0.0010	mg/L	J		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:11:02
Barium	7440-39-3	0.16	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:09:53
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:09:53
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:09:53
Calcium	7440-70-2	18.8	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:09:53
Chromium	7440-47-3	0.0010	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:09:53
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:09:53
Copper	7440-50-8	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:11:02
Iron	7439-89-6	0.44	mg/L			M	0.056	0.037	0.019	1.00	9/27/2019	01:11:02
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:09:53
Magnesium	7439-95-4	7.1	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:09:53
Manganese	7439-96-5	0.027	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:09:53
Nickel	7440-02-0	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:09:53
Potassium	7440-09-7	1.00	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:09:53
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:11:02
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:09:53
Sodium	7440-23-5	8.9	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:09:53
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:09:53
Vanadium	7440-62-2	0.0013	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:09:53
Zinc	7440-66-6	0.0043	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:11:02

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 6020 3015 DOD

Sample ID: 3058771003 **Client ID:** 03MW06SI-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	04:13:10
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:13:10
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:14:18
Barium	7440-39-3	0.11	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:13:10
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:13:10
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:13:10
Calcium	7440-70-2	10.7	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:13:10
Chromium	7440-47-3	0.0047	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:13:10
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:13:10
Copper	7440-50-8	0.0022	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:14:18
Iron	7439-89-6	0.040	mg/L	J		M	0.056	0.037	0.019	1.00	9/27/2019	01:14:18
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:13:10
Magnesium	7439-95-4	3.7	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:13:10
Manganese	7439-96-5	0.0039	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:13:10
Nickel	7440-02-0	0.0049	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:13:10
Potassium	7440-09-7	1.1	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:13:10
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:14:18
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:13:10
Sodium	7440-23-5	11.2	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:13:10
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:13:10
Vanadium	7440-62-2	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:13:10
Zinc	7440-66-6	0.0038	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:14:18

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 6020 3015 DOD

Sample ID: 3058771004 **Client ID:** 03MW06S-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.047	mg/L	J		M	0.089	0.059	0.030	1.00	9/26/2019	04:22:59
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:22:59
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:24:05
Barium	7440-39-3	0.036	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:22:59
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:22:59
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:22:59
Calcium	7440-70-2	10.4	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:22:59
Chromium	7440-47-3	0.0040	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:22:59
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:22:59
Copper	7440-50-8	0.0045	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:24:05
Iron	7439-89-6	0.078	mg/L			M	0.056	0.037	0.019	1.00	9/27/2019	01:24:05
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:22:59
Magnesium	7439-95-4	5.6	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:22:59
Manganese	7439-96-5	0.0058	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:22:59
Nickel	7440-02-0	0.0042	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:22:59
Potassium	7440-09-7	1.4	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:22:59
Selenium	7782-49-2	0.0041	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:24:05
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:22:59
Sodium	7440-23-5	10.9	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:22:59
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:22:59
Vanadium	7440-62-2	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:22:59
Zinc	7440-66-6	0.0062	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:24:05

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 6020 3015 DOD

Sample ID: 3058771005 **Client ID:** 03MW02S-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	04:26:15
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:26:15
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:27:19
Barium	7440-39-3	0.10	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:26:15
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:26:15
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:26:15
Calcium	7440-70-2	8.5	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:26:15
Chromium	7440-47-3	0.0029	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:26:15
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:26:15
Copper	7440-50-8	0.0028	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:27:19
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	01:27:19
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:26:15
Magnesium	7439-95-4	3.9	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:26:15
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:26:15
Nickel	7440-02-0	0.0025	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:26:15
Potassium	7440-09-7	1.1	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:26:15
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:27:19
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:26:15
Sodium	7440-23-5	7.6	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:26:15
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:26:15
Vanadium	7440-62-2	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:26:15
Zinc	7440-66-6	0.0045	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:27:19

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 6020 3015 DOD

Sample ID: 3058771006 **Client ID:** 03MW02I-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.14	mg/L			M	0.089	0.059	0.030	1.00	9/26/2019	04:29:32
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:29:32
Arsenic	7440-38-2	0.0015	mg/L	J		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:30:34
Barium	7440-39-3	0.32	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:30:34
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:29:32
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:29:32
Calcium	7440-70-2	22.2	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:29:32
Chromium	7440-47-3	0.0066	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:29:32
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:29:32
Copper	7440-50-8	0.023	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:30:34
Iron	7439-89-6	0.50	mg/L			M	0.056	0.037	0.019	1.00	9/27/2019	01:30:34
Lead	7439-92-1	0.0018	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:29:32
Magnesium	7439-95-4	10.5	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:29:32
Manganese	7439-96-5	0.057	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:29:32
Nickel	7440-02-0	0.0050	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:29:32
Potassium	7440-09-7	0.81	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:29:32
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:30:34
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:29:32
Sodium	7440-23-5	8.1	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:29:32
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:29:32
Vanadium	7440-62-2	0.0024	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:29:32
Zinc	7440-66-6	0.047	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:30:34

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 6020 3015 DOD

Sample ID: 3058771007 **Client ID:** 03MW02SI-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	04:32:48
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:32:48
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:33:49
Barium	7440-39-3	0.32	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:33:49
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:32:48
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:32:48
Calcium	7440-70-2	24.9	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:32:48
Chromium	7440-47-3	0.0022	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:32:48
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:32:48
Copper	7440-50-8	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:33:49
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	01:33:49
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:32:48
Magnesium	7439-95-4	12.8	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:32:48
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:32:48
Nickel	7440-02-0	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:32:48
Potassium	7440-09-7	0.77	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:32:48
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:33:49
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:32:48
Sodium	7440-23-5	11.5	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:32:48
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:32:48
Vanadium	7440-62-2	0.0020	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:32:48
Zinc	7440-66-6	0.0023	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:33:49

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 7470 DOD

Sample ID: 3058771002 **Client ID:** 03MW03S-20190916

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 543104 **Prep Date:** 9/20/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/20/2019	16:15:49

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 7470 DOD

Sample ID: 3058771003 **Client ID:** 03MW06SI-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 543104 **Prep Date:** 9/20/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/20/2019	16:19:30

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 7470 DOD

Sample ID: 3058771004 **Client ID:** 03MW06S-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 543104 **Prep Date:** 9/20/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/20/2019	16:23:06

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 7470 DOD

Sample ID: 3058771005 **Client ID:** 03MW02S-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 543104 **Prep Date:** 9/20/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/20/2019	16:24:18

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 7470 DOD

Sample ID: 3058771006 **Client ID:** 03MW02I-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 543104 **Prep Date:** 9/20/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/20/2019	16:25:30

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-029 **Method Type:** 7470 DOD

Sample ID: 3058771007 **Client ID:** 03MW02SI-20190917

Matrix: WATER **Date Received:** 9/18/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 543104 **Prep Date:** 9/20/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/20/2019	16:27:58

Comments:

APPENDIX C

SUPPORT DOCUMENTATION

VMD

ALS
301 Fulling Mill Road
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED
SAMPLER. INSTRUCTIONS ON TH

3058771

: 1 3058771 | 1 of 1

uote #: 190903035

Client Name: Tetra Tech	Container Type	VOA Vial	Poly	Poly	Poly	Poly							
Address: 234 Mall Boulevard Suite 260 King of Prussia, PA 19406	Container Size	40ml	125ml	1 Liter	1 Liter	1 Liter							
	Preservative	HCl	HNO_3	HNO_3	HNO_3	HNO_3							
Contact: Tricia Moore	ANALYSES/METHOD REQUESTED												
Phone#: 610 382 1173		40 ml VOA Vial VOCs	125ml Poly Metals + Hg	1 Liter Poly Radium - 226	1 Liter Poly Strontium - 90	1 Liter Poly Uranium - 238							
Project Name/#: Willow Grove Sites 3 and 12													
Bill To: Tetra Tech Foster Plaza 7													

Receipt Information (completed by Receiving Lab)
W.O. Temp: ____ Therm ID: ____
Analyst Initials: ____
Courier/Tracking #:
Purchase Order #:
Project Comments:

TAT ☑ Normal-Standard TAT is 10-12 business days.
☐ Rush-Subject to ALS approval and surcharges.
Date Required: Approved?
Email? ☐ -Y
Fax? ☐ -Y No.:

ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment
Other:

	Sample Description/Location (as it will appear on the lab report)	Date Collected mm/dd/yy	Time hh:mm	*G or C	**Matrix	Enter Number of Containers Per Sample or Field Results Below.										Sample/COC Comments
1	TB-01-20190916	9/16/19	0800	G	Aq	2										Laboratory Supplied
2	03MW03S-20190916	9/16/19	1600	G	GW	2	1	1	1	1						
3	03MW06SI-20190917	9/17/19	1120	G	GW	6	3	3	3	3						Do MS/MSD
4	03MW06S-20190917	9/17/19	1125	G	GW	2	1	1	1	1						
5	03MW02S-20190917	9/17/19	1430	G	GW	2	1	1	1	1						
6	03MW02I-20190917	9/17/19	1445	G	GW	2	1	1	1	1						
7	03MW02SI-20190917	9/17/19	1615	G	GW	2	1	1	1	1						
8																
9																
10																

SAMPLED BY (Please Print): Charles Meyer

Sampler Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] Tetra Tech	9/17/19	1930	2 FedEx		
3 FedEx			4 Client ALS	9/18/19	0901
5			6		
7			8		
9			10		

Data Deliverables: ☑ Standard ☐ CLP-like ☐ USACE/DOD
Special Processing: USACE ☐
Reportable to PADEP? Yes ☐ No ☑
PWSID #
Sample Disposal: Lab ☑ Special ☐
EDDS: Format Type-
State Samples Collected In: ☐ NY ☐ NJ ☑ PA ☐ other

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

ALS SHIPPING ADDRESS: 301 Fulling Mill Road, Middletown, PA 17057

Rev 04/19

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

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
tetratech	305 8771	EM	9/18/19

1. Were airbills / tracking numbers present and recorded?	NONE	(YES)	NO
Tracking number: 7762 6725 8537 + 8294			
2. Are Custody Seals on shipping containers intact?	NONE	(YES)	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		(YES)	NO
5a. Does the COC contain sample locations?		(YES)	NO
5b. Does the COC contain date and time of sample collection for all samples?		(YES)	NO
5c. Does the COC contain sample collectors name?		(YES)	NO
5d. Does the COC note the type(s) of preservation for all bottles?		(YES)	NO
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		(YES)	NO
5g. Does the COC note the matrix of the sample(s)?		(YES)	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		(YES)	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	(N/A)	YES	NO
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #: _____

Temperature (°C): 6

Thermometer ID: 403

Radiological (µCi): _____

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

Rev. 4/25/2019

ALS Environmental
34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

Internal Chain of Custody

Work Order: 3058771

3058771001-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771001-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771001-C	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771002-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771002-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771002-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:32	META-PREP	storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771002-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771002-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771002-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

ALS Environmental
34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

Internal Chain of Custody

Work Order: 3058771

3058771002-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-C	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-D	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-G	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:32	META-PREP	storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-H	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:32	META-PREP	storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-I	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:32	META-PREP	storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-J	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To

Internal Chain of Custody

Work Order: 3058771

3058771003-J (cont)	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-K	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-L	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-M	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-N	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-O	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-P	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-Q	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-R	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771003-S	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

Internal Chain of Custody

Work Order: 3058771

3058771004-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771004-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771004-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:32	META-PREP	storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771004-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771004-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771004-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771004-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771005-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771005-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

Internal Chain of Custody

Work Order: 3058771

3058771005-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:32	META-PREP	storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771005-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771005-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771005-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771005-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771006-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771006-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771006-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:32	META-PREP	storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771006-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

Internal Chain of Custody

Work Order: 3058771

3058771006-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771006-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771006-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771007-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771007-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:30	V47	Storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771007-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:32	META-PREP	storage	REED, EMILY
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771007-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771007-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771007-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

3058771007-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To

ALS Environmental
34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

Internal Chain of Custody

Work Order: 3058771

3058771007-G (cont)	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-19-19 13:01	RECEIVING	LOGIN	Welk, Ms. Stacey I.
09-18-19 09:01	*Sample Received At Lab*		

Tetra Tech

ALS-Middletown
Case Narrative
EPR-029 (3058771)

Sample Management

This report contains the results of the analysis of seven (7) water samples collected on September 16-18, 2019. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is >40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on September 18, 2019. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Subcontracted Data

Six (6) water samples were submitted to ALS Fort Collins, Colorado for the analysis of isotopic uranium, radium-226, and strontium-90. The data has been included at the end of this data package.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Seven (7) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All extractions and analyses were performed within holding time.

Initial Calibrations. Initial calibrations were properly performed and met method criteria for target analytes. **NOTE:** The batch LCS also serves as a second source (ICV)).

Continuing Calibration Verification. Continuing calibration standards were not applicable. Analysis of the sample followed the calibration.

Blanks. Target analytes were not detected in the blanks, except as follows:

- In MB 3015410, 1,4-dioxane was detected at 99.5 µg/L.

Surrogates. Recoveries were within control limits, except as follows:

- For 03MW06S-20190917 (3058771004), 3017123 MB, 03MW02S-20190917 (3058771005), and 03MW02SI-20190917 (3058771007), bromofluorobenzene was recovered above the control limits.

Laboratory control samples. Results for precision and accuracy were within control limits, except as follows:

- In 3017124 LCS, 1,4-dioxane was recovered above the control limits.

Matrix Spike/Matrix Spike Duplicate. A matrix spike/matrix spike duplicate pair, identified as 3015848/3015849, were extracted and analyzed from project sample 3058771003. All results for precision and accuracy were within control limits, except as follows:

- In the matrix spike, 1,1-dichloroethene and trans-1,2-dichloroethene were recovered above the control limits. 1,4-Dioxane and 1,2,3-trichlorobenzene were recovered below the control limits.

- In the matrix spike duplicate, 1,1-dichloroethene and 1,4-dioxane were recovered above the control limits.
- The RPDs between the MS and MSD were below the control limit except for 1,4-dioxane.

Internal Standards. Internal standard results met method criteria.

Total Metals by SW-846 Method 6020A

Sample handling. Six (6) water samples were digested by SW-846 Method 3015 and analyzed for total metals on the Agilent 7700x ICP-MS, using SW-846 Method 6020A. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Spikes. A matrix spike and matrix spike duplicate was prepared and analyzed on sample 3058771003 (03MW06SI-20190917) in this deliverable group. Recoveries were within method control limits, with the following exceptions:

- Ca and Na results were greater than 4x the spiking solution concentrations. Recoveries were not calculated (NSC) for this reason.

Dilution Test. A dilution test was not performed on a sample in this data deliverable.

Total Mercury in Water by EPA Method 7470A

Sample handling. Six (6) water samples were analyzed for total mercury using EPA method 7470A. The samples were digested and analyzed within the 28-day holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within control limits.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Sample. The laboratory control sample was recovered within the control limits.

Spikes. A matrix spike and matrix spike duplicate analysis was performed on sample 3058771003 (03MW06SI-20190917). All recoveries were within method acceptance limits.

I _Jennifer M. Stanhope Lamoreux_, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated PDF data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at _717-944-5541_ if there are any questions or problems with the enclosed electronic deliverables.

Signature: _____ Title:_Reporting Manager_ Date:_11/4/2019_

ALS Environmental

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

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

SAMPLE SUMMARY

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3058771001	TB-01-20190916	Water	9/18/2019 09:01	9/18/2019 09:01	Collected by Client
3058771002	03MW03S-20190916	Water	9/16/2019 16:00	9/18/2019 09:01	Collected by Client
3058771003	03MW06SI-20190917	Water	9/17/2019 11:20	9/18/2019 09:01	Collected by Client
3058771004	03MW06S-20190917	Water	9/17/2019 11:25	9/18/2019 09:01	Collected by Client
3058771005	03MW02S-20190917	Water	9/17/2019 14:30	9/18/2019 09:01	Collected by Client
3058771006	03MW02I-20190917	Water	9/17/2019 14:45	9/18/2019 09:01	Collected by Client
3058771007	03MW02SI-20190917	Water	9/17/2019 16:15	9/18/2019 09:01	Collected by Client

ALS Environmental

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

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

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

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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: 3058771 EPR029|Willow Grove Sites 3 an

Workorder Comments

Please see attached subcontracting from ALS Ft. Collins. VNB 9/19/19

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3058771 EPR029|Willow Grove Sites 3 an

Lab ID	Sample ID	Analysis Method	Prep Method
3058771001	TB-01-20190916	SW846 8260C	
3058771002	03MW03S-20190916	SW846 6020A	SW846 3015
3058771002	03MW03S-20190916	SW846 7470A	SW846 7470A
3058771002	03MW03S-20190916	SW846 8260C	
3058771002	03MW03S-20190916	Subcontract	
3058771003	03MW06SI-20190917	SW846 6020A	SW846 3015
3058771003	03MW06SI-20190917	SW846 7470A	SW846 7470A
3058771003	03MW06SI-20190917	SW846 8260C	
3058771003	03MW06SI-20190917	Subcontract	
3058771004	03MW06S-20190917	SW846 6020A	SW846 3015
3058771004	03MW06S-20190917	SW846 7470A	SW846 7470A
3058771004	03MW06S-20190917	SW846 8260C	
3058771004	03MW06S-20190917	Subcontract	
3058771005	03MW02S-20190917	SW846 6020A	SW846 3015
3058771005	03MW02S-20190917	SW846 7470A	SW846 7470A
3058771005	03MW02S-20190917	SW846 8260C	
3058771005	03MW02S-20190917	Subcontract	
3058771006	03MW02I-20190917	SW846 6020A	SW846 3015
3058771006	03MW02I-20190917	SW846 7470A	SW846 7470A
3058771006	03MW02I-20190917	SW846 8260C	
3058771006	03MW02I-20190917	Subcontract	
3058771007	03MW02SI-20190917	SW846 6020A	SW846 3015
3058771007	03MW02SI-20190917	SW846 7470A	SW846 7470A
3058771007	03MW02SI-20190917	SW846 8260C	
3058771007	03MW02SI-20190917	Subcontract	

Volatile Organic Compounds by Method 8260 Summary Forms

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-029

Lab File ID: 719092300.D BFB Injection Date: 9/23/2019

Instrument ID: ms07.i BFB Injection Time: 09:15

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: Y/N N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.3
75	30.0 - 60.0% of mass 95	49.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.8(1.0) 1
174	50.0 - 100.0% of mass 95	78.6
175	5.0 - 9.0% of mass 174	5.9 (7.5) 1
176	95.0 - 101.0% of mass 174	75.8 (96.5) 1
177	5.0 - 9.0% of mass 176	5.2 (6.8) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
VSTD00.5	VSTD00.5	719092303.D	9/23/2019	10:33
1234	1234	719092304.D	9/23/2019	10:56
1235	1235	719092305.D	9/23/2019	11:19
1236	1236	719092306.D	9/23/2019	11:41
1237	1237	719092307.D	9/23/2019	12:04
1238	1238	719092308.D	9/23/2019	12:27
1239	1239	719092309.D	9/23/2019	12:50
3015410(MB)	3015410	719092313.D	9/23/2019	14:21
3015411(LCS)	3015411	719092314.D	9/23/2019	14:43
TB-01-20190916	3058771001	719092316.D	9/23/2019	15:29
03MW03S-20190916	3058771002	719092320.D	9/23/2019	16:59
03MW06SI-20190917	3058771003	719092321.D	9/23/2019	17:22
03MW06S-20190917	3058771004	719092322.D	9/23/2019	17:45
03MW06SI-2019...MS	3015848	719092326.D	9/23/2019	19:15
03MW06SI-201...MSD	3015849	719092327.D	9/23/2019	19:38
1801	1801	719092328.D	9/23/2019	20:00

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/23/2019 9/23/2019

Heated Purge: (Y/N) N Calibration Time(s): 10:33 12:50

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092304.D RRF005 = 719092305.D RRF020 = 719092306.D RRF050 = 719092307.D

RRF100 = 719092308.D RRF200 = 719092309.D RRF00.5 = 719092303.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Acetone	0.01756	0.02380		A		0.017980		14.76366
Acrolein	0.04296	0.04104		A		0.040320		8.97206
Acrylonitrile	0.07839	0.08225		A		0.079180		4.39365
Acetonitrile	0.01754	0.01932		A		0.015970		13.37399
tert-Amyl Ethylether	7049752	11019		L	0.000000	2.089880		0.99924
tert-Amyl methyl ether	0.52477	0.37525		A		0.475410		14.80522
tert-Amyl Alcohol	811512	1180		Q	0.000000	0.007780	0.000100	0.99906
Benzene	0.80286	0.83100		A		0.819640		4.92527
Benzyl Chloride	1091065	914		Q	0.000000	0.192060	0.004110	0.99878
Bromobenzene	0.57617	0.62472		A		0.594280		5.84133
Bromochloromethane	0.09226	0.09761		A		0.095840		3.66917
Bromodichloromethane	0.27660	0.23646		A		0.252960		10.28653
Bromoform *	1986205	2580		L	0.000000	2.516280		0.99946
Bromomethane	0.08842	0.09405		A		0.081870		11.69250
2-Butanone	0.02848	0.02762		A		0.026690		7.98356
tert.- Butyl Alcohol	853673	1448		Q	0.000000	0.008200	0.000100	0.99873
tert-Butylbenzene	0.46787	0.42415		A		0.442260		12.57572
n-Butylbenzene	2409814	3066		L	0.000000	2.061570		0.99894
sec-Butylbenzene	11766263	18420		L	0.000000	0.415690		0.99755
Carbon Disulfide	0.60122	0.81267		A		0.643830		11.74785
Carbon Tetrachloride	0.26563	0.23031		A		0.230690		14.76991
Chloroacetonitrile	565958	977		Q	0.000000	0.013580	0.000160	0.99905
Chlorobenzene *	1.24648	1.34505		A		1.270090		4.45444
1-Chlorobutane	0.23026	0.25274		A		0.225390		6.72815
Chlorodibromomethane	3072243	4600		L	0.000000	1.962070		0.99897
Chloroethane	0.14178	0.17272		A		0.159220		7.29224
2-Chloroethylvinyl ether	1831649	2226		L	0.000000	8.063640		0.99833
Chloroform **	0.37771	0.40396		A		0.376500		4.30272
1-Chlorohexane	4448037	7245		L	0.000000	1.343770		0.99915
Chloromethane *	0.22241	0.28719		A		0.229750		11.16611
Chloroprene	0.32462	0.28421		A		0.299440		10.31019
3-Chloro-1-propene	0.28372	0.28978		A		0.285160		6.31410
o-Chlorotoluene	1.92536	1.83980		A		1.919390		9.18775
p-Chlorotoluene	1.75512	1.66351		A		1.754460		8.93821
Cyclohexane	0.33888	0.32170		A		0.308970		14.00022
1,2-Dibromo-3-Chloropropane	572804	612		Q	0.000000	0.106100	0.001370	0.99875

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/23/2019 9/23/2019

Heated Purge: (Y/N) N Calibration Time(s): 10:33 12:50

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092304.D RRF005 = 719092305.D RRF020 = 719092306.D RRF050 = 719092307.D

RRF100 = 719092308.D RRF200 = 719092309.D RRF00.5 = 719092303.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2-Dibromoethane	0.46470	0.41892		A		0.421390		9.39140
Dibromomethane	0.13075	0.12046		A		0.122770		5.95380
trans-1,4-Dichloro-2-butene	980731	1339		L	0.000000	5.068260		0.99929
1,2-Dichlorobenzene	0.96851	0.97328		A		0.942120		7.93411
1,3-Dichlorobenzene	1.07555	1.10683		A		1.062380		6.02806
1,4-Dichlorobenzene	1.05328	1.25631		A		1.089900		7.87529
Dichlorodifluoromethane	0.27335	0.25184		A		0.266690		3.18616
1,1-Dichloroethane *	0.36522	0.33615		A		0.352520		4.58263
1,2-Dichloroethene, Total	0.28281	0.29908		A		0.273800		6.54175
1,2-Dichloroethane	0.25598	0.25860		A		0.249840		4.04702
1,1-Dichloroethene **	3869609	7972		L	0.000000	3.830030		0.99900
cis-1,2-Dichloroethene	0.29307	0.32907		A		0.286640		7.98276
trans-1,2-Dichloroethene	3994981	8397		Q	0.000000	0.269900	0.000460	0.99980
Dichlorofluoromethane	0.35040	0.36032		A		0.345120		3.55200
1,1-Dichloro-2-Propanone	369054	504		L	0.000000	82.112381		0.99798
2,2-Dichloropropane	0.26644	0.24467		A		0.240580		9.53766
1,3-Dichloropropane	0.79057	0.73658		A		0.750120		6.47265
1,2-Dichloropropane **	0.23036	0.21406		A		0.215310		7.85889
1,1-Dichloropropene	0.30298	0.27783		A		0.279160		10.00438
cis-1,3-Dichloropropene	0.83933	0.61905		A		0.722510		14.55553
trans-1,3-Dichloropropene	0.76795	0.57771		A		0.660350		14.30177
1,3-Dichloropropene, Total	0.80364	0.59838		A		0.691430		14.42767
Diisobutylene	8528683	85136		L	0.000000	1.701670		0.99826
Diisopropyl ether	0.66250	0.56332		A		0.613950		9.99472
1,4-Dioxane	172328	486		Q	0.000000	0.000370	0.000001	0.99900
Ethyl Acetate	0.22567	0.21502		A		0.202570		12.30858
Ethyl ether	0.12093	0.11738		A		0.116500		3.90045
Ethyl Methacrylate	4392153	5538		L	0.000000	1.364910		0.99902
Ethyl tert-butyl ether	0.60457	0.47773		A		0.540140		12.54250
Ethylbenzene **	0.71312	0.70189		A		0.683960		8.30480
Freon 113	0.20479	0.20483		A		0.189080		11.32747
Heptane	2331100	4199		Q	0.000000	0.156790	0.000490	0.99650
Hexachlorobutadiene	928926	1618		Q	0.000000	0.186970	0.000050	0.99662
Hexachloroethane	2005402	2645		L	0.000000	2.512600		0.99859
Hexane	6651140	12891		L	0.000000	2.201200		0.99909
2-Hexanone	10287910	17105		L	0.000000	2.849570		0.99765

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/23/2019 9/23/2019

Heated Purge: (Y/N) N Calibration Time(s): 10:33 12:50

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092304.D RRF005 = 719092305.D RRF020 = 719092306.D RRF050 = 719092307.D

RRF100 = 719092308.D RRF200 = 719092309.D RRF00.5 = 719092303.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Iodomethane	1305951	460		Q	0.000000	0.059720	0.004500	0.99659
Isobutyl alcohol	260319	660		Q	0.000000	0.001840	-7.912000	0.99843
Isopropyl Alcohol	313660	1130		Q	0.000000	0.002550	0.000050	0.99714
Isopropylbenzene	2.40445	2.40381		A		2.457560		11.78986
p-Isopropyltoluene	2761010	3654		L	0.000000	1.798030		0.99933
Methyl acetate	0.03872	0.03695		A		0.035480		8.63669
Methyl acrylate	0.21538	0.18160		A		0.193790		11.88579
Methacrylonitrile	0.09764	0.08723		A		0.091160		9.01853
Methyl cyclohexane	5622247	10502		L	0.000000	1.066090		0.99874
Methyl methacrylate	2919068	4513		L	0.000000	5.005230		0.99907
Methyl t-Butyl Ether	0.54607	0.46815		A		0.503970		8.97743
4-Methyl-2-Pentanone(MIBK)	0.46111	0.45770		A		0.478510		11.30972
Methylene Chloride	0.19225	0.24092		A		0.199890		9.22123
Naphthalene	5847578	644		Q	0.000000	0.969910	0.031580	0.99563
Nitrobenzene	0.01732			A		0.008130		86.11077
2-Nitropropane	4084753	6011		L	0.000000	7.363400		0.99866
Octane	1466912	2439		Q	0.000000	0.236770	0.001600	0.99322
Pentachloroethane	0.39658	0.39265		A		0.385270		8.48913
Pentane	0.18950	0.26280		A		0.205830		13.32499
n-Propanol	0.01130	0.01321		A		0.011820		5.38348
Propionitrile	0.02765	0.02612		A		0.025980		7.05988
n-Propylbenzene	0.68766	0.64144		A		0.663860		13.39859
Styrene	1.61137	1.46043		A		1.564770		11.67090
1,1,1,2-Tetrachloroethane	0.46073	0.35795		A		0.406760		11.52245
1,1,2,2-Tetrachloroethane *	0.69841	0.80524		A		0.732400		5.44005
Tetrachloroethene	0.44809	0.42605		A		0.417130		7.07298
Tetrahydrofuran	0.06358	0.05500		A		0.058640		9.16503
Toluene **	1.23846	1.15502		A		1.179680		8.02863
Total Xylenes	0.82711	0.73041		A		0.781050		11.06472
1,2,3-Trichlorobenzene	1970603	172		Q	0.000000	0.357850	0.005880	0.99758
1,2,4-Trichlorobenzene	2491164	475		Q	0.000000	0.460740	0.006120	0.99824
1,1,1-Trichloroethane	0.29798	0.26267		A		0.268420		10.66405
1,1,2-Trichloroethane	0.38446	0.36244		A		0.366390		4.81579
Trichloroethene	0.22315	0.28251		A		0.224180		13.03105
Trichlorofluoromethane	0.29743	0.32305		A		0.323540		4.38877
1,2,3-Trichloropropane	0.20254	0.21191		A		0.206150		2.34477

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/23/2019 9/23/2019

Heated Purge: (Y/N) N Calibration Time(s): 10:33 12:50

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092304.D RRF005 = 719092305.D RRF020 = 719092306.D RRF050 = 719092307.D

RRF100 = 719092308.D RRF200 = 719092309.D RRF00.5 = 719092303.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2,4-Trimethylbenzene	1.95599	1.64759		A		1.873340		14.72592
1,3,5-Trimethylbenzene	1.91107	1.67394		A		1.867500		14.60301
Vinyl Acetate	0.04688	0.03871		A		0.040180		14.93478
Vinyl Chloride **	0.27971	0.25149		A		0.269910		5.12770
o-Xylene	0.83912	0.66535		A		0.746490		14.67000
mp-Xylene	0.82111	0.76293		A		0.798330		9.59955
4-Bromofluorobenzene		0.68359		A		0.563160		12.06685
Dibromofluoromethane	0.18524	0.17333		A		0.176270		4.11519
1,2-Dichloroethane-d4	0.20932	0.22710		A		0.207610		5.15513
Toluene-d8	1.67351	1.70492		A		1.629800		5.27740

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.
SPCC Compounds (*) with required minimum RRF.
CCC Compounds (**) with required maximum %RSD.

ALS Environmental Services

RECOVERY REPORT

Client Name: Client SDG: 7190923.b
Sample Matrix: LIQUID Fraction: VOA
Lab Smp Id: 1801
Level: LOW Operator: TMP
Data Type: MS DATA SampleType: LCS
SpikeList File: DODENDCCV.spk Quant Type: ISTD
Sublist File: DODall.sub
Method File: \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190923.b\7-8260b09
Misc Info:

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
1	Dichlorodifluorome	50.0000	52.2315	104.46	50-150
2	Chloromethane	50.0000	47.5591	95.12	50-150
3	Vinyl Chloride	50.0000	53.3027	106.61	50-150
4	Bromomethane	50.0000	47.3361	94.67	50-150
5	Chloroethane	50.0000	46.9461	93.89	50-150
6	Pentane	50.0000	50.9076	101.82	50-150
7	Trichlorofluoromet	50.0000	52.8079	105.62	50-150
8	Dichlorofluorometh	50.0000	53.5365	107.07	50-150
9	Ethyl Ether	50.0000	52.0138	104.03	50-150
10	1,1-Dichloroethene	50.0000	49.7043	99.41	50-150
11	Freon 113	50.0000	54.9841	109.97	50-150
12	Carbon Disulfide	50.0000	49.3125	98.63	50-150
13	Iodomethane	50.0000	47.8053	95.61	50-150
14	Acrolein	250.000	240.584	96.23	50-150
15	Isopropyl Alcohol	250.000	296.825	118.73	50-150
16	3-Chloro-1-propene	50.0000	52.2636	104.53	50-150
17	Methylene Chloride	50.0000	49.3617	98.72	50-150
18	Acetone	250.000	221.750	88.70	50-150
19	Methyl acetate	50.0000	56.3559	112.71	50-150
20	trans-1,2-Dichloro	50.0000	51.5837	103.17	50-150
21	Hexane	50.0000	48.5419	97.08	50-150
22	Methyl t-Butyl Eth	50.0000	54.0169	108.03	50-150
23	tert.- Butyl Alcoh	250.000	262.187	104.87	50-150
24	Acetonitrile	250.000	257.284	102.91	50-150
25	Diisopropyl ether	50.0000	54.8581	109.72	50-150
26	Chloroprene	50.0000	55.2638	110.53	50-150
27	1,1-Dichloroethane	50.0000	52.8951	105.79	50-150
28	Acrylonitrile	250.000	261.577	104.63	50-150
30	n-Propanol	500.000	488.574	97.71	50-150
29	Ethyl tert-butyl e	50.0000	55.1946	110.39	50-150
31	Vinyl acetate	50.0000	52.4752	104.95	50-150
32	cis-1,2-Dichloroet	50.0000	51.4397	102.88	50-150
33	2,2-Dichloropropan	50.0000	46.8912	93.78	50-150
34	Bromochloromethane	50.0000	53.2124	106.42	50-150
35	Cyclohexane	50.0000	56.7269	113.45	50-150
36	Chloroform	50.0000	51.1927	102.39	50-150
37	Ethyl acetate	50.0000	51.0780	102.16	50-150
38	Methyl acrylate	50.0000	53.8969	107.79	50-150
39	Carbon Tetrachlori	50.0000	56.7083	113.42	50-150
40	Tetrahydrofuran	250.000	261.812	104.72	50-150

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
42	1,1,1-Trichloroeth	50.0000	55.2387	110.48	50-150
43	2-Butanone	250.000	256.521	102.61	50-150
44	1,1-Dichloropropen	50.0000	55.0946	110.19	50-150
45	1-Chlorobutane	50.0000	51.8005	103.60	50-150
46	Heptane	50.0000	45.0183	90.04	50-150
47	Benzene	50.0000	53.2793	106.56	50-150
48	Propionitrile	250.000	259.660	103.86	50-150
49	Methacrylonitrile	50.0000	53.5775	107.16	50-150
50	tert-amyl methyl E	50.0000	57.0607	114.12	50-150
54	Isobutyl alcohol	500.000	416.560	83.31	50-150
52	1,2-Dichloroethane	50.0000	51.1786	102.36	50-150
53	tert-Amyl Alcohol	250.000	247.889	99.16	50-150
56	Diisobutylene	50.0000	50.8285	101.66	50-150
57	Trichloroethene	50.0000	51.0316	102.06	50-150
58	Methyl cyclohexane	50.0000	49.1653	98.33	50-150
59	tert-Amyl Ethyleth	50.0000	48.0034	96.01	50-150
60	Dibromomethane	50.0000	52.0311	104.06	50-150
61	1,2-Dichloropropan	50.0000	53.7186	107.44	50-150
62	Bromodichlorometha	50.0000	53.9425	107.89	50-150
63	Methyl methacrylat	50.0000	47.9113	95.82	50-150
64	1,4-Dioxane	1250.00	1342.53	107.40	50-150
65	2-Chloroethylvinyl	50.0000	41.6728	83.35	50-150
66	cis-1,3-Dichloropr	50.0000	54.1509	108.30	50-150
67	Octane	50.0000	43.4201	86.84	50-150
69	Toluene	50.0000	53.8149	107.63	50-150
70	Chloroacetonitrile	250.000	254.171	101.67	50-150
71	2-Nitropropane	250.000	220.229	88.09	50-150
72	1,1-Dichloro-2-pro	250.000	211.296	84.52	50-150
73	4-Methyl-2-Pentano	250.000	275.660	110.26	50-150
74	Tetrachloroethene	50.0000	56.2619	112.52	50-150
75	trans-1,3-Dichloro	50.0000	53.4048	106.81	50-150
76	Ethyl methacrylate	50.0000	46.8267	93.65	50-150
77	1,1,2-Trichloroeth	50.0000	51.2793	102.56	50-150
78	Chlorodibromometha	50.0000	46.2934	92.59	50-150
80	1,2-Dibromoethane	50.0000	53.0405	106.08	50-150
81	2-Hexanone	250.000	251.186	100.47	50-150
82	1-Chlorohexane	50.0000	49.6476	99.30	50-150
79	1,3-Dichloropropan	50.0000	52.3768	104.75	50-150
84	Chlorobenzene	50.0000	51.8365	103.67	50-150
85	Ethylbenzene	50.0000	53.4614	106.92	50-150
86	1,1,1,2-Tetrachlor	50.0000	54.3052	108.61	50-150
87	mp-Xylene	100.000	109.792	109.79	50-150
88	o-Xylene	50.0000	56.6286	113.26	50-150
89	Styrene	50.0000	55.5136	111.03	50-150
90	Bromoform	50.0000	45.9587	91.92	50-150
91	Isopropylbenzene	50.0000	56.0976	112.20	50-150
93	Bromobenzene	50.0000	52.2290	104.46	50-150
94	n-Propylbenzene	50.0000	55.6116	111.22	50-150
95	1,1,2,2-Tetrachlor	50.0000	49.7734	99.55	50-150
96	o-Chlorotoluene	50.0000	54.0148	108.03	50-150
M 100	1,2-Dichloroethene	100.000	103.023	103.02	50-150
97	1,3,5-Trimethylben	50.0000	55.8963	111.79	50-150
98	1,2,3-Trichloropro	50.0000	51.2706	102.54	50-150
99	trans-1,4-Dichloro	50.0000	38.8109	77.62	50-150

	SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
	101 p-Chlorotoluene	50.0000	53.9163	107.83	50-150
	102 tert-Butylbenzene	50.0000	54.7193	109.44	50-150
	103 Pentachloroethane	50.0000	48.1555	96.31	50-150
	104 1,2,4-Trimethylben	50.0000	56.1611	112.32	50-150
	105 sec-Butylbenzene	50.0000	53.8743	107.75	50-150
	106 p-Isopropyltoluene	50.0000	50.2038	100.41	50-150
	107 1,3-Dichlorobenzen	50.0000	51.6624	103.32	50-150
	109 1,4-Dichlorobenzen	50.0000	49.9939	99.99	50-150
	110 Benzyl Chloride	50.0000	36.0854	72.17	50-150
	111 n-Butylbenzene	50.0000	48.9532	97.91	50-150
	112 Hexachloroethane	50.0000	45.5975	91.19	50-150
	113 1,2-Dichlorobenzen	50.0000	52.4313	104.86	50-150
	114 1,2-Dibromo-3-chlo	50.0000	45.1998	90.40	50-150
	115 Nitrobenzene	500.000	51.1916	10.24*	50-150
	116 Hexachlorobutadien	50.0000	46.9336	93.87	50-150
	117 1,2,4-Trichloroben	50.0000	45.4433	90.89	50-150
	118 Naphthalene	50.0000	41.4204	82.84	50-150
M	120 1,3-Dichloropropen	100.000	107.556	107.56	50-150
	119 1,2,3-Trichloroben	50.0000	43.9417	87.88	50-150
M	121 TOTAL XYLENES	150.000	166.421	110.95	50-150

	SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$	41 Dibromofluorometha	50.0000	50.2922	100.58	80-119
$	51 1,2-Dichloroethane	50.0000	48.1773	96.35	81-118
$	68 Toluene-d8	50.0000	50.4050	100.81	89-112
$	92 4-Bromofluorobenze	50.0000	50.6455	101.29	85-114

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.

3015410

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-029

Lab File ID: 719092313.D Lab Sample ID: 3015410

Date Analyzed: 9/23/2019 Time Analyzed: 14:21

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: ms07.i

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
3015411(LCS)	3015411	719092314.D	14:43
TB-01-20190916	3058771001	719092316.D	15:29
03MW03S-20190916	3058771002	719092320.D	16:59
03MW06SI-20190917	3058771003	719092321.D	17:22
03MW06S-20190917	3058771004	719092322.D	17:45
03MW06SI-2019...MS	3015848	719092326.D	19:15
03MW06SI-201...MSD	3015849	719092327.D	19:38

COMMENTS:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3015410(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3015410

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092313.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	99.5	
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3015410(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3015410

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092313.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Laboratory Control Spike - Sample No: 3015411

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Acetone	100		95.0	95	(39-160)
Benzene	20		22.0	110	(79-120)
Bromochloromethane	20		21.9	109	(78-123)
Bromodichloromethane	20		21.6	108	(79-125)
Bromoform	20		18.5	92.5	(66-130)
Bromomethane	20		18.6	92.9	(53-141)
2-Butanone	100		103	103	(56-143)
Carbon Disulfide	20		20.2	101	(64-133)
Carbon Tetrachloride	20		23.4	117	(72-136)
Chlorobenzene	20		20.7	104	(82-118)
Chlorodibromomethane	20		18.1	90.4	(74-126)
Chloroethane	20		20.6	103	(60-138)
Chloroform	20		21.1	105	(79-124)
Chloromethane	20		19.8	99	(50-139)
Cyclohexane	20		23.5	117	(71-130)
1,2-Dibromo-3-Chloropro	20		17.4	87	(62-128)
1,2-Dibromoethane	20		20.9	105	(77-121)
1,2-Dichlorobenzene	20		20.7	103	(80-119)
1,3-Dichlorobenzene	20		20.2	101	(80-119)
1,4-Dichlorobenzene	20		19.8	98.9	(79-118)
Dichlorodifluoromethane	20		19.0	94.9	(32-152)
1,1-Dichloroethane	20		23.1	116	(77-125)
1,2-Dichloroethane	20		21.3	107	(73-128)
1,1-Dichloroethene	20		24.2	121	(71-131)
cis-1,2-Dichloroethene	20		21.0	105	(78-123)
trans-1,2-Dichloroethen	20		24.2	121	(75-124)
1,2-Dichloropropane	20		21.3	106	(78-122)
cis-1,3-Dichloropropene	20		21.8	109	(75-124)
trans-1,3-Dichloroprope	20		21.6	108	(73-127)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 0 out of 51 outside limits

Comments:

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Laboratory Control Spike - Sample No: 3015411

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
1,4-Dioxane	500		313	62.5	(59-139)
Ethylbenzene	20		21.1	106	(79-121)
Freon 113	20		21.2	106	(70-136)
2-Hexanone	100		101	101	(57-139)
Isopropylbenzene	20		22.4	112	(72-131)
Methyl acetate	20		24.1	121	(56-136)
Methyl cyclohexane	20		19.5	97.7	(72-132)
Methyl t-Butyl Ether	20		21.6	108	(71-124)
4-Methyl-2-Pentanone(MI	100		112	112	(67-130)
Methylene Chloride	20		21.5	108	(74-124)
Styrene	20		22.0	110	(78-123)
1,1,2,2-Tetrachloroetha	20		20.3	102	(71-121)
Tetrachloroethene	20		21.7	108	(74-129)
Toluene	20		21.7	108	(80-121)
Total Xylenes	60		65.4	109	(79-121)
1,2,3-Trichlorobenzene	20		14.7	73.4	(69-129)
1,2,4-Trichlorobenzene	20		16.0	80.2	(69-130)
1,1,1-Trichloroethane	20		23.5	117	(74-131)
1,1,2-Trichloroethane	20		20.8	104	(80-119)
Trichloroethene	20		21.0	105	(79-123)
Trichlorofluoromethane	20		21.6	108	(65-141)
Vinyl Chloride	20		21.7	109	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 0 out of 51 outside limits

Comments:

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-029

Lab File ID: 719092550.D BFB Injection Date: 9/25/2019

Instrument ID: ms07.i BFB Injection Time: 19:30

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: Y/N N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.0
75	30.0 - 60.0% of mass 95	48.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.4(0.6) 1
174	50.0 - 100.0% of mass 95	80.0
175	5.0 - 9.0% of mass 174	5.9 (7.3) 1
176	95.0 - 101.0% of mass 174	78.5 (98.1) 1
177	5.0 - 9.0% of mass 176	4.9 (6.2) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
VSTD00.5	VSTD00.5	719092553.D	9/25/2019	20:42
1234	1234	719092554.D	9/25/2019	21:05
1235	1235	719092555.D	9/25/2019	21:27
1236	1236	719092556.D	9/25/2019	21:50
1237	1237	719092557.D	9/25/2019	22:12
1238	1238	719092558.D	9/25/2019	22:35
1239	1239	719092559.D	9/25/2019	22:58
3017124(LCS)	3017124	719092562.D	9/26/2019	00:06
3017123(MB)	3017123	719092566.D	9/26/2019	01:36
03MW02S-20190917	3058771005	719092571.D	9/26/2019	03:29
03MW02I-20190917	3058771006	719092572.D	9/26/2019	03:52
03MW02SI-20190917	3058771007	719092573.D	9/26/2019	04:14
1801	1801	719092576.D	9/26/2019	05:22

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Acetone	948980	2799		Q	0.000000	0.010740	0.000070	0.99462
Acrolein	0.03781	0.03988		A		0.036540		7.46760
Acrylonitrile	0.06718	0.07281		A		0.063760		9.23389
Acetonitrile	876235	2689		Q	0.000000	0.007490	0.000140	0.99052
tert-Amyl Ethylether	0.48680	0.40561		A		0.426490		11.69584
tert-Amyl methyl ether	0.56029	0.50076		A		0.508660		9.95701
tert-Amyl Alcohol	456008	873		Q	0.000000	0.003520	0.000080	0.99109
Benzene	0.82712	0.99980		A		0.870710		6.78730
Benzyl Chloride	843955	482		Q	0.000000	0.137320	0.004370	0.99970
Bromobenzene	0.56475	0.71172		A		0.613040		8.33190
Bromochloromethane	0.09635	0.11487		A		0.102920		6.64619
Bromodichloromethane	0.28242	0.25992		A		0.260940		8.15598
Bromoform *	0.37575	0.32573		A		0.335700		10.49233
Bromomethane	0.10617	0.11863		A		0.104700		8.28861
2-Butanone	0.02203	0.02684		A		0.022570		11.23267
tert.- Butyl Alcohol		1152		Q	0.000000	0.007300	-0.000190	0.99785
tert-Butylbenzene	0.45793	0.44241		A		0.460130		3.15276
n-Butylbenzene	0.47269	0.34682		A		0.430180		12.38009
sec-Butylbenzene	2.31406	2.31244		A		2.444270		5.28271
Carbon Disulfide	0.62949	0.86237		A		0.668270		13.05718
Carbon Tetrachloride	0.27691	0.28056		A		0.251080		9.12839
Chloroacetonitrile		780		Q	0.000000	0.012160	-0.000300	0.99682
Chlorobenzene *	1.21425	1.49358		A		1.302190		7.33158
1-Chlorobutane	0.23601	0.29213		A		0.235720		11.14631
Chlorodibromomethane	0.49599	0.39797		A		0.431120		12.63160
Chloroethane	2219745	13138		Q	0.000000	0.176420	-0.003080	0.99999
2-Chloroethylvinyl ether	1636827	1853		Q	0.000000	0.095400	0.002930	0.99976
Chloroform **	0.38686	0.47550		A		0.396050		8.99195
1-Chlorohexane	0.72874	0.67927		A		0.683460		7.45111
Chloromethane *	0.24683	0.34536		A		0.260080		14.55037
Chloroprene	0.33588	0.36404		A		0.318780		9.23389
3-Chloro-1-propene	0.28227	0.34211		A		0.290900		8.53556
o-Chlorotoluene	1.86949	2.02278		A		1.977110		3.26220
p-Chlorotoluene	1.72043	1.88084		A		1.804560		3.63136
Cyclohexane	0.34992	0.34726		A		0.338340		5.32706
1,2-Dibromo-3-Chloropropane	497970	520		Q	0.000000	0.077350	0.003090	0.99913

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2-Dibromoethane	0.43951	0.44051		A		0.413070		7.80489
Dibromomethane	0.13079	0.14679		A		0.128370		7.44545
trans-1,4-Dichloro-2-butene	847809	987		L	0.000000	6.041410		0.99936
1,2-Dichlorobenzene	0.94617	0.95910		A		0.950220		3.80318
1,3-Dichlorobenzene	1.05020	1.12790		A		1.076130		5.28740
1,4-Dichlorobenzene	1.02708	1.26952		A		1.108140		9.61832
Dichlorodifluoromethane	0.32338	0.40669		A		0.327620		11.09148
1,1-Dichloroethane *	0.37338	0.41541		A		0.369100		6.69796
1,2-Dichloroethene, Total	0.29080	0.32965		A		0.284870		7.48920
1,2-Dichloroethane	0.25747	0.30168		A		0.259450		7.84294
1,1-Dichloroethene **	0.26189	0.32864		A		0.263560		12.71009
cis-1,2-Dichloroethene	0.29860	0.32539		A		0.292800		5.91975
trans-1,2-Dichloroethene	0.28300	0.33392		A		0.276950		9.51743
Dichlorofluoromethane	0.36317	0.44879		A		0.371590		9.62849
1,1-Dichloro-2-Propanone	291819	395		Q	0.000000	0.007720	0.000050	0.99848
2,2-Dichloropropane	0.25071	0.27133		A		0.235250		8.99257
1,3-Dichloropropane	0.75768	0.80803		A		0.746270		5.36210
1,2-Dichloropropane **	0.23419	0.23751		A		0.224910		5.86267
1,1-Dichloropropene	0.31415	0.34944		A		0.305260		7.47762
cis-1,3-Dichloropropene	0.80057	0.67782		A		0.715360		11.26637
trans-1,3-Dichloropropene	0.72243	0.58081		A		0.637930		12.49726
1,3-Dichloropropene, Total	0.76150	0.62932		A		0.676650		11.82276
Diisobutylene	8434168	85487		L	0.000000	1.679030		0.99950
Diisopropyl ether	0.66714	0.63446		A		0.632240		7.31200
1,4-Dioxane	149560			Q	0.000000	0.000260	0.000001	0.99926
Ethyl Acetate	0.19852	0.19263		A		0.179340		11.76447
Ethyl ether	0.12179	0.14325		A		0.119550		10.66867
Ethyl Methacrylate	4161149	6351		L	0.000000	1.471870		0.99961
Ethyl tert-butyl ether	0.60989	0.55193		A		0.560560		9.10205
Ethylbenzene **	0.69752	0.81231		A		0.718680		7.20869
Freon 113	0.21161	0.22838		A		0.207070		8.39360
Heptane	0.15448	0.13867		A		0.139550		10.47982
Hexachlorobutadiene	0.20054	0.19642		A		0.187590		8.98053
Hexachloroethane	0.38858	0.31106		A		0.338100		10.99397
Hexane	0.44669	0.44168		A		0.423200		6.92083
2-Hexanone	4423925	6781		L	0.000000	6.922060		0.99963

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Iodomethane	1322383	249		Q	0.000000	0.064510	0.004370	0.99551
Isobutyl alcohol	182803	459		Q	0.000000	0.000730	0.000008	0.99217
Isopropyl Alcohol		361		Q	0.000000	0.002230	-0.000060	0.99819
Isopropylbenzene	2.35427	2.60241		A		2.576400		4.69555
p-Isopropyltoluene	0.54224	0.42228		A		0.514570		9.36138
Methyl acetate	0.03431	0.03733		A		0.032950		10.49648
Methyl acrylate	0.19736	0.17559		A		0.180580		8.94379
Methacrylonitrile	0.09056	0.09622		A		0.088550		6.78720
Methyl cyclohexane	0.91892	0.95331		A		0.895750		9.95149
Methyl methacrylate	0.18618	0.16826		A		0.165090		13.24116
Methyl t-Butyl Ether	0.54858	0.51947		A		0.517340		6.12188
4-Methyl-2-Pentanone(MIBK)	8869360	13603		Q	0.000000	0.248790	0.001250	0.99887
Methylene Chloride	2814861	9437		L	0.000000	5.048260		0.99986
Naphthalene	5487471	683		Q	0.000000	0.704010	0.056740	0.99857
Nitrobenzene	428299			Q	0.000000	-0.002080	0.000160	0.99610
2-Nitropropane	3447874	5405		Q	0.000000	0.097420	0.000470	0.99921
Octane	0.23140	0.21911		A		0.203940		14.77699
Pentachloroethane	0.36275	0.36448		A		0.366060		4.52175
Pentane	2708082	9008		Q	0.000000	0.208280	-0.002680	0.99986
n-Propanol	0.01113	0.01516		A		0.011840		12.50008
Propionitrile	1549366	4287		Q	0.000000	0.017610	0.000120	0.99447
n-Propylbenzene	0.67587	0.67469		A		0.692560		2.54349
Styrene	1.55889	1.59911		A		1.590120		4.30460
1,1,1,2-Tetrachloroethane	0.45161	0.45504		A		0.427700		6.27376
1,1,2,2-Tetrachloroethane *	0.63893	0.74063		A		0.672930		5.24785
Tetrachloroethene	0.46330	0.55251		A		0.474290		9.18633
Tetrahydrofuran	0.05338	0.05629		A		0.050920		9.59334
Toluene **	1.21456	1.31349		A		1.222220		3.85046
Total Xylenes	0.80875	0.82404		A		0.813960		3.62583
1,2,3-Trichlorobenzene	1978950	185		Q	0.000000	0.314430	0.011340	0.99902
1,2,4-Trichlorobenzene	2489280	95.00000		Q	0.000000	0.421820	0.010410	0.99922
1,1,1-Trichloroethane	0.31106	0.31881		A		0.290010		7.31166
1,1,2-Trichloroethane	0.36684	0.42046		A		0.367980		6.87792
Trichloroethene	0.22998	0.28809		A		0.236230		10.44862
Trichlorofluoromethane	4689266	15850		Q	0.000000	0.370020	-0.006080	0.99996
1,2,3-Trichloropropane	0.18557	0.21697		A		0.195070		6.18577

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2,4-Trimethylbenzene	1.89758	1.69320		A		1.919470		6.07993
1,3,5-Trimethylbenzene	1.86226	1.78525		A		1.932330		4.43656
Vinyl Acetate	0.04481	0.03720		A		0.038780		13.13814
Vinyl Chloride **	0.30652	0.42053		A		0.316810		14.60306
o-Xylene	0.82392	0.74438		A		0.781300		6.00514
mp-Xylene	0.80116	0.86388		A		0.830290		3.85630
4-Bromofluorobenzene	0.53981	0.67405		A		0.550840		10.05903
Dibromofluoromethane	0.18677	0.17922		A		0.177720		5.72689
1,2-Dichloroethane-d4	0.20645	0.21109		A		0.200220		3.45681
Toluene-d8	1.60907	1.59074		A		1.588710		5.34518

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.
SPCC Compounds (*) with required minimum RRF.
CCC Compounds (**) with required maximum %RSD.

ALS Environmental Services

RECOVERY REPORT

Client Name: Client SDG: 7190925A.b
Sample Matrix: LIQUID Fraction: VOA
Lab Smp Id: 1801
Level: LOW Operator: PDK
Data Type: MS DATA SampleType: LCS
SpikeList File: DODENDCCV.spk Quant Type: ISTD
Sublist File: DODall.sub
Method File: \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190925A.b\7-8260b0
Misc Info:

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
1	Dichlorodifluorome	50.0000	50.9742	101.95	50-150
2	Chloromethane	50.0000	50.6285	101.26	50-150
3	Vinyl Chloride	50.0000	49.8842	99.77	50-150
4	Bromomethane	50.0000	42.8696	85.74	50-150
5	Chloroethane	50.0000	51.6205	103.24	50-150
6	Pentane	50.0000	53.8170	107.63	50-150
7	Trichlorofluoromet	50.0000	52.6040	105.21	50-150
8	Dichlorofluorometh	50.0000	51.1964	102.39	50-150
9	Ethyl Ether	50.0000	51.3345	102.67	50-150
10	1,1-Dichloroethene	50.0000	53.1270	106.25	50-150
11	Freon 113	50.0000	52.1674	104.33	50-150
12	Carbon Disulfide	50.0000	50.1192	100.24	50-150
13	Iodomethane	50.0000	40.3214	80.64	50-150
14	Acrolein	250.000	259.103	103.64	50-150
15	Isopropyl Alcohol	250.000	0.000000	0.00*	50-150
16	3-Chloro-1-propene	50.0000	52.3612	104.72	50-150
17	Methylene Chloride	50.0000	50.7413	101.48	50-150
18	Acetone	250.000	296.061	118.42	50-150
19	Methyl acetate	50.0000	51.0729	102.15	50-150
20	trans-1,2-Dichloro	50.0000	49.5919	99.18	50-150
21	Hexane	50.0000	54.1363	108.27	50-150
22	Methyl t-Butyl Eth	50.0000	51.8661	103.73	50-150
23	tert.- Butyl Alcoh	250.000	415.215	166.09*	50-150
24	Acetonitrile	250.000	375.467	150.19*	50-150
25	Diisopropyl ether	50.0000	53.9773	107.95	50-150
26	Chloroprene	50.0000	53.7516	107.50	50-150
27	1,1-Dichloroethane	50.0000	52.1682	104.34	50-150
28	Acrylonitrile	250.000	268.758	107.50	50-150
30	n-Propanol	500.000	496.152	99.23	50-150
29	Ethyl tert-butyl e	50.0000	53.4556	106.91	50-150
31	Vinyl acetate	50.0000	52.5286	105.06	50-150
32	cis-1,2-Dichloroet	50.0000	51.5215	103.04	50-150
33	2,2-Dichloropropan	50.0000	58.0618	116.12	50-150
34	Bromochloromethane	50.0000	52.0592	104.12	50-150
35	Cyclohexane	50.0000	54.1860	108.37	50-150
36	Chloroform	50.0000	50.6512	101.30	50-150
37	Ethyl acetate	50.0000	52.1326	104.27	50-150
38	Methyl acrylate	50.0000	52.0846	104.17	50-150
39	Carbon Tetrachlori	50.0000	52.1876	104.38	50-150
40	Tetrahydrofuran	250.000	262.021	104.81	50-150

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
42	1,1,1-Trichloroeth	50.0000	52.5218	105.04	50-150
43	2-Butanone	250.000	269.142	107.66	50-150
44	1,1-Dichloropropen	50.0000	52.1980	104.40	50-150
45	1-Chlorobutane	50.0000	50.9164	101.83	50-150
46	Heptane	50.0000	54.4602	108.92	50-150
47	Benzene	50.0000	51.9926	103.99	50-150
48	Propionitrile	250.000	312.531	125.01	50-150
49	Methacrylonitrile	50.0000	50.7535	101.51	50-150
50	tert-amyl methyl E	50.0000	50.5140	101.03	50-150
54	Isobutyl alcohol	500.000	846.126	169.23*	50-150
52	1,2-Dichloroethane	50.0000	50.2739	100.55	50-150
53	tert-Amyl Alcohol	250.000	400.415	160.17*	50-150
56	Diisobutylene	50.0000	51.8413	103.68	50-150
57	Trichloroethene	50.0000	50.2002	100.40	50-150
58	Methyl cyclohexane	50.0000	51.8077	103.62	50-150
59	tert-Amyl Ethyleth	50.0000	54.6183	109.24	50-150
60	Dibromomethane	50.0000	49.7062	99.41	50-150
61	1,2-Dichloropropan	50.0000	52.9697	105.94	50-150
62	Bromodichlorometha	50.0000	53.9787	107.96	50-150
63	Methyl methacrylat	50.0000	53.9620	107.92	50-150
64	1,4-Dioxane	1250.00	971.381	77.71	50-150
65	2-Chloroethylvinyl	50.0000	45.1100	90.22	50-150
66	cis-1,3-Dichloropr	50.0000	55.2516	110.50	50-150
67	Octane	50.0000	51.9491	103.90	50-150
69	Toluene	50.0000	51.5298	103.06	50-150
70	Chloroacetonitrile	250.000	374.970	149.99	50-150
71	2-Nitropropane	250.000	251.619	100.65	50-150
72	1,1-Dichloro-2-pro	250.000	265.132	106.05	50-150
73	4-Methyl-2-Pentano	250.000	259.498	103.80	50-150
74	Tetrachloroethene	50.0000	46.2459	92.49	50-150
75	trans-1,3-Dichloro	50.0000	55.1525	110.31	50-150
76	Ethyl methacrylate	50.0000	47.1611	94.32	50-150
77	1,1,2-Trichloroeth	50.0000	49.5087	99.02	50-150
78	Chlorodibromometha	50.0000	52.8968	105.79	50-150
80	1,2-Dibromoethane	50.0000	51.0960	102.19	50-150
81	2-Hexanone	250.000	233.784	93.51	50-150
82	1-Chlorohexane	50.0000	56.1305	112.26	50-150
79	1,3-Dichloropropan	50.0000	50.7183	101.44	50-150
84	Chlorobenzene	50.0000	50.0402	100.08	50-150
85	Ethylbenzene	50.0000	50.3608	100.72	50-150
86	1,1,1,2-Tetrachlor	50.0000	50.8968	101.79	50-150
87	mp-Xylene	100.000	104.830	104.83	50-150
88	o-Xylene	50.0000	53.3558	106.71	50-150
89	Styrene	50.0000	52.9429	105.89	50-150
90	Bromoform	50.0000	49.1841	98.37	50-150
91	Isopropylbenzene	50.0000	52.5445	105.09	50-150
93	Bromobenzene	50.0000	48.7511	97.50	50-150
94	n-Propylbenzene	50.0000	52.6545	105.31	50-150
95	1,1,2,2-Tetrachlor	50.0000	48.9857	97.97	50-150
96	o-Chlorotoluene	50.0000	50.9475	101.90	50-150
M 100	1,2-Dichloroethene	100.000	101.113	101.11	50-150
97	1,3,5-Trimethylben	50.0000	53.3029	106.61	50-150
98	1,2,3-Trichloropro	50.0000	47.9569	95.91	50-150
99	trans-1,4-Dichloro	50.0000	41.9929	83.99	50-150

	SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
	101 p-Chlorotoluene	50.0000	51.2520	102.50	50-150
	102 tert-Butylbenzene	50.0000	52.5569	105.11	50-150
	103 Pentachloroethane	50.0000	53.5208	107.04	50-150
	104 1,2,4-Trimethylben	50.0000	53.8634	107.73	50-150
	105 sec-Butylbenzene	50.0000	52.5749	105.15	50-150
	106 p-Isopropyltoluene	50.0000	53.5050	107.01	50-150
	107 1,3-Dichlorobenzen	50.0000	49.3419	98.68	50-150
	109 1,4-Dichlorobenzen	50.0000	47.8014	95.60	50-150
	110 Benzyl Chloride	50.0000	56.9737	113.95	50-150
	111 n-Butylbenzene	50.0000	55.2192	110.44	50-150
	112 Hexachloroethane	50.0000	52.4558	104.91	50-150
	113 1,2-Dichlorobenzen	50.0000	49.9560	99.91	50-150
	114 1,2-Dibromo-3-chlo	50.0000	48.1873	96.37	50-150
	115 Nitrobenzene	500.000	522.226	104.45	50-150
	116 Hexachlorobutadien	50.0000	47.6825	95.36	50-150
	117 1,2,4-Trichloroben	50.0000	45.6312	91.26	50-150
	118 Naphthalene	50.0000	43.0235	86.05	50-150
M	120 1,3-Dichloropropen	100.000	110.404	110.40	50-150
	119 1,2,3-Trichloroben	50.0000	44.8956	89.79	50-150
M	121 TOTAL XYLENES	150.000	158.185	105.46	50-150

	SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$	41 Dibromofluorometha	49.9980	51.4148	102.83	80-119
$	51 1,2-Dichloroethane	49.9980	50.5809	101.17	81-118
$	68 Toluene-d8	49.9980	51.6684	103.34	89-112
$	92 4-Bromofluorobenze	49.9980	52.1137	104.23	85-114

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.

3017123

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-029

Lab File ID: 719092566.D Lab Sample ID: 3017123

Date Analyzed: 9/26/2019 Time Analyzed: 01:36

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: ms07.i

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
3017124(LCS)	3017124	719092562.D	00:06
03MW02S-20190917	3058771005	719092571.D	03:29
03MW02I-20190917	3058771006	719092572.D	03:52
03MW02SI-20190917	3058771007	719092573.D	04:14

COMMENTS:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3017123(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3017123

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092566.D

Level (low/med): Date Received: 9/25/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3017123(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3017123

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092566.D

Level (low/med): Date Received: 9/25/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Laboratory Control Spike - Sample No: 3017124

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Acetone	100		142	142	(39-160)
Benzene	20		20.5	102	(79-120)
Bromochloromethane	20		20.6	103	(78-123)
Bromodichloromethane	20		21.0	105	(79-125)
Bromoform	20		20.8	104	(66-130)
Bromomethane	20		15.8	79	(53-141)
2-Butanone	100		115	115	(56-143)
Carbon Disulfide	20		17.8	89	(64-133)
Carbon Tetrachloride	20		21.8	109	(72-136)
Chlorobenzene	20		19.9	99.6	(82-118)
Chlorodibromomethane	20		21.2	106	(74-126)
Chloroethane	20		18.5	92.6	(60-138)
Chloroform	20		20.0	100	(79-124)
Chloromethane	20		18.8	93.9	(50-139)
Cyclohexane	20		21.4	107	(71-130)
1,2-Dibromo-3-Chloropro	20		20.3	101	(62-128)
1,2-Dibromoethane	20		20.7	104	(77-121)
1,2-Dichlorobenzene	20		20.2	101	(80-119)
1,3-Dichlorobenzene	20		19.6	97.9	(80-119)
1,4-Dichlorobenzene	20		19.2	95.8	(79-118)
Dichlorodifluoromethane	20		18.1	90.4	(32-152)
1,1-Dichloroethane	20		22.0	110	(77-125)
1,2-Dichloroethane	20		20.3	101	(73-128)
1,1-Dichloroethene	20		22.0	110	(71-131)
cis-1,2-Dichloroethene	20		20.5	102	(78-123)
trans-1,2-Dichloroethen	20		22.5	112	(75-124)
1,2-Dichloropropane	20		20.5	103	(78-122)
cis-1,3-Dichloropropene	20		22.0	110	(75-124)
trans-1,3-Dichloroprope	20		22.7	113	(73-127)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 1 out of 51 outside limits

Comments:

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Laboratory Control Spike - Sample No: 3017124

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
1,4-Dioxane	500		949	190*	(59-139)
Ethylbenzene	20		20.1	100	(79-121)
Freon 113	20		18.2	91.2	(70-136)
2-Hexanone	100		99.7	99.7	(57-139)
Isopropylbenzene	20		21.0	105	(72-131)
Methyl acetate	20		21.8	109	(56-136)
Methyl cyclohexane	20		20.8	104	(72-132)
Methyl t-Butyl Ether	20		21.3	106	(71-124)
4-Methyl-2-Pentanone(MI	100		110	110	(67-130)
Methylene Chloride	20		21.8	109	(74-124)
Styrene	20		20.9	104	(78-123)
1,1,2,2-Tetrachloroetha	20		20.9	105	(71-121)
Tetrachloroethene	20		18.4	92.2	(74-129)
Toluene	20		20.6	103	(80-121)
Total Xylenes	60		62.6	104	(79-121)
1,2,3-Trichlorobenzene	20		17.5	87.7	(69-129)
1,2,4-Trichlorobenzene	20		17.6	87.9	(69-130)
1,1,1-Trichloroethane	20		22.1	111	(74-131)
1,1,2-Trichloroethane	20		20.2	101	(80-119)
Trichloroethene	20		20.1	100	(79-123)
Trichlorofluoromethane	20		19.5	97.5	(65-141)
Vinyl Chloride	20		18.8	93.8	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 1 out of 51 outside limits

Comments:

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix Spike - Sample No: 03MW06SI-2019...MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC#	QC LIMIT REC
Acetone	100	0	82.2	82.2	(39-160)
Benzene	20	0	22.7	114	(79-120)
Bromochloromethane	20	0	22.1	110	(78-123)
Bromodichloromethane	20	0	20.9	105	(79-125)
Bromoform	20	0	17.3	86.3	(66-130)
Bromomethane	20	0	20.8	104	(53-141)
2-Butanone	100	0	89.9	89.9	(56-143)
Carbon Disulfide	20	0	21.2	106	(64-133)
Carbon Tetrachloride	20	0	24.5	123	(72-136)
Chlorobenzene	20	0	20.6	103	(82-118)
Chlorodibromomethane	20	0	17.3	86.3	(74-126)
Chloroethane	20	0	22.1	110	(60-138)
Chloroform	20	0	21.5	108	(79-124)
Chloromethane	20	0	20.3	101	(50-139)
Cyclohexane	20	0	25.2	126	(71-130)
1,2-Dibromo-3-chloropropane	20	0	15.0	75.2	(62-128)
1,2-Dibromoethane	20	0	19.8	98.8	(77-121)
1,2-Dichlorobenzene	20	0	20.9	105	(80-119)
1,3-Dichlorobenzene	20	0	20.5	103	(80-119)
1,4-Dichlorobenzene	20	0	20.3	101	(79-118)
Dichlorodifluoromethane	20	0	21.4	107	(32-152)
1,1-Dichloroethane	20	0	23.9	120	(77-125)
1,2-Dichloroethane	20	0	21.3	106	(73-128)
1,1-Dichloroethene	20	0	26.7	134*	(71-131)
cis-1,2-Dichloroethene	20	0	21.5	108	(78-123)
trans-1,2-Dichloroethene	20	0	25.0	125*	(75-124)
1,2-Dichloropropane	20	0	21.7	108	(78-122)
cis-1,3-Dichloropropene	20	0	20.9	104	(75-124)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 4 out of 51 outside limits

Comments:

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix Spike - Sample No: 03MW06SI-2019...MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC#	QC LIMIT REC
trans-1,3-Dichloropropene	20	0	20.6	103	(73-127)
1,4-Dioxane	500	0	242	48.5*	(59-139)
Ethylbenzene	20	0	21.5	107	(79-121)
Freon 113	20	0	23.3	117	(70-136)
2-Hexanone	100	0	88.6	88.6	(57-139)
Isopropylbenzene	20	0	23.7	118	(72-131)
Methyl acetate	20	0	16.5	82.6	(56-136)
Methyl cyclohexane	20	0	20.8	104	(72-132)
Methyl t-Butyl Ether	20	0	21.3	106	(71-124)
4-Methyl-2-Pentanone(MIBK)	100	0	102	102	(67-130)
Methylene Chloride	20	0	21.8	109	(74-124)
Styrene	20	0	22.4	112	(78-123)
1,1,2,2-Tetrachloroethane	20	0	19.9	99.4	(71-121)
Tetrachloroethene	20	0	21.0	105	(74-129)
Toluene	20	0	21.9	109	(80-121)
TOTAL XYLENES	60	0	65.9	110	(79-121)
1,2,3-Trichlorobenzene	20	0	12.4	62.2*	(69-129)
1,2,4-Trichlorobenzene	20	0	14.3	71.7	(69-130)
1,1,1-Trichloroethane	20	0	24.6	123	(74-131)
1,1,2-Trichloroethane	20	0	20.2	101	(80-119)
Trichloroethene	20	0	21.8	109	(79-123)
Trichlorofluoromethane	20	0	24.0	120	(65-141)
Vinyl Chloride	20	0	23.0	115	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 4 out of 51 outside limits

Comments:

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: EPR-029

Matrix Spike - Sample No: 03MW06SI-201...MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	MSD % RPD #	QC LIMITS RPD	QC LIMITS REC
Acetone	100	94.3	94.3	13.7	30	(39-160)
Benzene	20	23.1	116	1.77	30	(79-120)
Bromochloromethane	20	22.2	111	.86	30	(78-123)
Bromodichloromethane	20	21.6	108	3.25	30	(79-125)
Bromoform	20	17.7	88.4	2.43	30	(66-130)
Bromomethane	20	17.5	87.3	17.3	30	(53-141)
2-Butanone	100	104	104	14	30	(56-143)
Carbon Disulfide	20	21.9	109	3.31	30	(64-133)
Carbon Tetrachloride	20	25.2	126	2.61	30	(72-136)
Chlorobenzene	20	21.4	107	3.87	30	(82-118)
Chlorodibromomethane	20	18.0	89.9	4.06	30	(74-126)
Chloroethane	20	22.0	110	.18	30	(60-138)
Chloroform	20	21.8	109	1.35	30	(79-124)
Chloromethane	20	21.4	107	5.52	30	(50-139)
Cyclohexane	20	26.0	130	3.08	30	(71-130)
1,2-Dibromo-3-chloropropane	20	17.0	84.8	12	30	(62-128)
1,2-Dibromoethane	20	20.8	104	5	30	(77-121)
1,2-Dichlorobenzene	20	21.4	107	2.07	30	(80-119)
1,3-Dichlorobenzene	20	21.1	106	2.75	30	(80-119)
1,4-Dichlorobenzene	20	20.7	104	2.23	30	(79-118)
Dichlorodifluoromethane	20	22.0	110	3.06	30	(32-152)
1,1-Dichloroethane	20	24.0	120	.25	30	(77-125)
1,2-Dichloroethane	20	21.1	105	.73	30	(73-128)
1,1-Dichloroethene	20	26.3	132*	1.51	30	(71-131)
cis-1,2-Dichloroethene	20	21.8	109	1.36	30	(78-123)
trans-1,2-Dichloroethene	20	24.6	123	1.62	30	(75-124)
1,2-Dichloropropane	20	21.9	110	1.21	30	(78-122)
cis-1,3-Dichloropropene	20	21.5	107	2.81	30	(75-124)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 1 out of 51 outside limits

Spike Recovery: 2 out of 51 outside limits

Comments: _____

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: _____ SAS No.: _____ SDG No.: EPR-029

Matrix Spike - Sample No: 03MW06SI-201...MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	MSD % RPD #	QC LIMITS RPD	QC LIMITS REC
trans-1,3-Dichloropropene	20	21.4	107	3.88	30	(73-127)
1,4-Dioxane	500	709	142*	98.1*	30	(59-139)
Ethylbenzene	20	22.4	112	4.4	30	(79-121)
Freon 113	20	23.7	118	1.55	30	(70-136)
2-Hexanone	100	99.9	99.9	12	30	(57-139)
Isopropylbenzene	20	24.1	121	1.95	30	(72-131)
Methyl acetate	20	18.1	90.5	9.13	30	(56-136)
Methyl cyclohexane	20	21.8	109	4.78	30	(72-132)
Methyl t-Butyl Ether	20	21.6	108	1.61	30	(71-124)
4-Methyl-2-Pentanone(MIBK)	100	113	113	9.53	30	(67-130)
Methylene Chloride	20	21.9	110	.63	30	(74-124)
Styrene	20	22.7	113	1.37	30	(78-123)
1,1,2,2-Tetrachloroethane	20	20.5	103	3.25	30	(71-121)
Tetrachloroethene	20	22.2	111	5.48	30	(74-129)
Toluene	20	22.9	115	4.72	30	(80-121)
TOTAL XYLENES	60	69.0	115	4.57	30	(79-121)
1,2,3-Trichlorobenzene	20	14.4	71.8	14.2	30	(69-129)
1,2,4-Trichlorobenzene	20	15.6	78.1	8.56	30	(69-130)
1,1,1-Trichloroethane	20	25.3	127	2.84	30	(74-131)
1,1,2-Trichloroethane	20	20.9	104	3.14	30	(80-119)
Trichloroethene	20	22.1	111	1.45	30	(79-123)
Trichlorofluoromethane	20	24.6	123	2.54	30	(65-141)
Vinyl Chloride	20	24.6	123	6.54	30	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 1 out of 51 outside limits

Spike Recovery: 2 out of 51 outside limits

Comments: _____

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: EPR-029

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
01	3015410(MB)	112	103	104	105	0
02	3015411(LCS)	108	102	106	102	0
03	TB-01-20190916	114	103	104	105	0
04	03MW03S-20190916	113	103	104	104	0
05	03MW06SI-20190917	111	100	101	102	0
06	03MW06S-20190917	115 *	105	105	105	1
07	03MW06SI-2019...MS	108	104	99.8	101	0
08	03MW06SI-201...MSD	108	103	105	104	0

QC LIMITS

SMC1 (BFB) = 4-Bromofluorobenzene (85-114)
SMC2 (DBFM) = Dibromofluoromethane (80-119)
SMC3 (DCE) = 1,2-Dichloroethane-d4 (81-118)
SMC4 (TOL) = Toluene-d8 (89-112)

Column to be used to flag recovery values
* Values outside of contract required QC Limits
D Surrogate Diluted Out

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: EPR-029

	Sample NO.	SMC1 (BFB) #		SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
09	3017124(LCS)	111		102	103	105	0
10	3017123(MB)	116	*	102	106	105	1
11	03MW02S-20190917	115	*	103	109	105	1
12	03MW02I-20190917	114		104	109	105	0
13	03MW02SI-20190917	116	*	102	107	105	1

	QC LIMITS
SMC1 (BFB) = 4-Bromofluorobenzene	(85-114)
SMC2 (DBFM) = Dibromofluoromethane	(80-119)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(81-118)
SMC4 (TOL) = Toluene-d8	(89-112)

Column to be used to flag recovery values

* Values outside of contract required QC Limits

D Surrogate Diluted Out

8Az

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Lab File ID: 719092307.D Date Analyzed: 9/23/2019

Instrument ID: ms07.i Time Analyzed: 12:04

GC Column: RTXVRX ID: 0.2 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT#	IS2 AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	858104	6.056	676679	7.825	2017195	4.058
UPPER LIMIT	1716208	6.226	1353358	7.995	4034390	4.228
LOWER LIMIT	429052	5.886	338340	7.655	1008598	3.888
SAMPLE NO.						
3015410(MB)	810815	6.053	574159	7.825	2023227	4.061
3015411(LCS)	862408	6.055	664878	7.825	2061173	4.061
TB-01-20190916	818088	6.053	565995	7.825	2031686	4.061
03MW03S-20190916	776044	6.053	537104	7.825	1918628	4.061
03MW06SI-20190917	779439	6.056	526415	7.825	1931494	4.061
03MW06S-20190917	758918	6.056	522441	7.825	1893059	4.061
03MW06SI-2019...M	835599	6.052	623323	7.824	1950072	4.061
03MW06SI-201...MS	828817	6.055	632450	7.824	1996300	4.061
1801	865752	6.056	680982	7.825	2058949	4.061

IS1 = Chlorobenzene-d5
IS2 = 1,4-Dichlorobenzene-d4
IS3 = Fluorobenzene

AREA UPPER LIMIT = +2% of internal standard area
AREA LOWER LIMIT = -1% of internal standard area
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8Az

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Lab File ID: 719092557.D Date Analyzed: 9/25/2019

Instrument ID: ms07.i Time Analyzed: 22:12

GC Column: RTXVRX ID: 0.2 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT#	IS2 AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	843306	6.056	678577	7.825	1955716	4.061
UPPER LIMIT	1686612	6.226	1357154	7.995	3911432	4.231
LOWER LIMIT	421653	5.886	339289	7.655	977858	3.891
SAMPLE NO.						
3017124(LCS)	882554	6.053	698400	7.824	2066194	4.058
3017123(MB)	817954	6.053	580265	7.825	1976071	4.061
03MW02S-20190917	783930	6.053	564448	7.824	1878336	4.061
03MW02I-20190917	771999	6.056	550437	7.825	1854171	4.061
03MW02SI-20190917	762580	6.056	535006	7.825	1852008	4.061
1801	854251	6.055	681500	7.824	1944067	4.061

IS1 = Chlorobenzene-d5
IS2 = 1,4-Dichlorobenzene-d4
IS3 = Fluorobenzene

AREA UPPER LIMIT = +2% of internal standard area
AREA LOWER LIMIT = -1% of internal standard area
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

Data File: \\GC01\TargetData\Chem2\ms07.i\7-2019\7190923.b

GCMS ANALYSIS - VOLATILE ORGANICS

DATE(S):	9/23/2019	Analyst:	TMP				
DATA FILE:	7190923xx.d	BFB INJ :	9/23/19 9:15	INSTRUMENT: MS07	METHOD(S)	8260W	D8260W	8260W_C
BATCH:	7190923.b	12-HOUR ENDING:	9/23/19 21:15	ICAL DATE: 9/23/2019	LIMS BATCH:		52399	

Pos #	Run #	ALS Sample ID (w/ Container ID)	Dilution	Test	pH	HDSP / Wt.	CL-	Comment	Pos #	Run #	ALS Sample ID (w/ Container ID)	Dilution	Test	pH	HDSP / Wt.	CL-	Comment
0	00	1000	1	BFB	-	-	-		32	33							
1	01	WP	1	8260	-	-	-		33	34							
2	02	WP	1	8260	-	-	-		34	35							
3	03	VSTD00.5	1	8260	-	-	-		35	36							
4	04	1234	1	8260	-	-	-		36	37							
5	05	1235	1	8260	-	-	-		37	38							
6	06	1236	1	8260	-	-	-		38	39							
7	07	1237	1	8260	-	-	-		39	40							
8	08	1238	1	8260	-	-	-		40	41							
9	09	1239	1	8260	-	-	-		41	42							
10	10	WP	1	8260	-	-	-		42	43							
11	11	WP	1	8260	-	-	-		43	44							
12	12	WP	1	8260	-	-	-		44	45							
13	13	3015410	1	8260	-	-	-		45	46							
14	14	3015411	1	8260	-	-	-		46	47							
15	15	WP	1	8260	-	-	-		47	48							
16	16	3058771001-A	1	D8260W V	<2	N	N		48	49							
17	17	3058362005-B	1	D8260W V	<2	N	N	(CORR)	49	50							
18	18	3058362002-B	10	D8260W V	<2	N	N	(DL)	50	51							
19	19	3058362004-B	10	D8260W V	<2	N	N	(DL)	51	52							
20	20	3058771002-A	1	D8260W V	<2	N	N		52	53							
21	21	3058771003-A	1	D8260W V	<2	N	N	MS/D PAID QC	53	54							
22	22	3058771004-A	1	D8260W V	<2	N	N	SS RR1X	54	55							
23	23	3058474001-A	20	D8260TCLP V	-	-	-	AF	55	56							
24	24	3058474002-A	20	D8260TCLP V	-	-	-	AF	56	57							
25	25	3014149	20	D8260TCLP V	-	-	-	AF	57	58							
26	26	3015848	1	D8260W V	<2	N	N	"E"	58	59							
27	27	3015849	1	D8260W V	<2	N	N	"F"	59	60							
28	28	1801	1	D8260W V	-	-	-		60	61							
29	29								61	62							
30	30								62	63							
31	31								63	64							
32	32								64	65							

IS:	VOA14-67-01	Vnew:	VOA14-70-06
SS:	VOA14-60-01	Vgas:	VOA14-70-06
BFB:	VOA14-53-16	Qvoa:	VOA14-69-01
1-4DIOX		Qgas:	VOA14-71-01
524IS/SS			

ABBREVIATIONS

CO:	Suspect Carryover	SS:	Surrogate Failure
LS:	Library Search	IS:	ISTD Failure
RR:	Rerun same dilution	DNR:	Do not Report
DFx:	Rerun @ less diln x	NU:	Not Used
DLx:	Rerun @ diln x	AF:	Antifoam was used

Prev		Prev	
Current		Current	
Total		Total	
Needs QC?		Needs QC?	

Data File: \\GC01\TargetData\Chem2\ms07.i\7-2019\7190925A.b

GCMS ANALYSIS - VOLATILE ORGANICS

DATE(S):	9/25/2019	Analyst:	PDK				
DATA FILE:	7190925xx.d	BFB INJ :	9/25/19 19:30	INSTRUMENT: MS07	METHOD(S)	8260W	D8260W	8260W_C
BATCH:	7190925A.b	12-HOUR ENDING:	9/26/19 7:30	ICAL DATE: 9/25/2019	LIMS BATCH:		52440	

Pos #	Run #	ALS Sample ID (w/ Container ID)	Dilution	Test	pH	HDSP / Wt.	CL-	Comment	Pos #	Run #	ALS Sample ID (w/ Container ID)	Dilution	Test	pH	HDSP / Wt.	CL-	Comment
0	50	1000	1	BFB	-	-	-		32	33							
1	51	WP	1	8260	-	-	-		33	34							
2	52	WP	1	8260	-	-	-		34	35							
3	53	VSTD00.5	1	8260	-	-	-		35	36							
4	54	1234	1	8260	-	-	-		36	37							
5	55	1235	1	8260	-	-	-		37	38							
6	56	1236	1	8260	-	-	-		38	39							
7	57	1237	1	8260	-	-	-		39	40							
8	58	1238	1	8260	-	-	-		40	41							
9	59	1239	1	8260	-	-	-		41	42							
10	60	WP	1	8260	-	-	-		42	43							
11	61	WP	1	8260	-	-	-		43	44							
12	62	3017124	1	8260	-	-	-		44	45							
13	63	WP	1	8260	-	-	-		45	46							
14	64	WP	1	8260	-	-	-		46	47							
15	65	WP	1	8260	-	-	-		47	48							
16	66	3017123	1	8260	-	-	-	SS	48	49							
17	67	3059026002-A	1	D8260W V	<2	N	N	SS	49	50							
18	68	3059231001-A	1	D8260W V	<2	N	N	SS	50	51							
19	69	3058771001-B	1	D8260W V	<2	Y	N	(RR) PREV RUN VIAL SS	51	52							
20	70	3058771004-B	1	D8260W V	<2	Y	N	(RR) PREV RUN VIAL SS	52	53							
21	71	3058771005-A	1	D8260W V	<2	N	N	SS	53	54							
22	72	3058771006-A	1	D8260W V	<2	N	N	SS	54	55							
23	73	3058771007-A	1	D8260W V	<2	N	N	SS	55	56							
24	74	3059026001-A	1	D8260W V	<2	N	N	SS	56	57							
25	75	3059231002-A	1	D8260W V	<2	N	N	SS	57	58							
26	76	1801	1	D8260W V	-	-	-		58	59							
27	77								59	60							
28	78								60	61							
29	79								61	62							
30	80								62	63							
31	81								63	64							
32	82								64	65							

IS:	VOA14-67-01	Vnew:	VOA14-70-06
SS:	VOA14-60-01	Vgas:	VOA14-71-16
BFB:	VOA14-53-16	Qvoa:	VOA14-69-01
1-4DIOX		Qgas:	VOA14-71-01
524IS/SS			

ABBREVIATIONS

CO:	Suspect Carryover	SS:	Surrogate Failure
LS:	Library Search	IS:	ISTD Failure
RR:	Rerun same dilution	DNR:	Do not Report
DFx:	Rerun @ less diln x	NU:	Not Used
DLx:	Rerun @ diln x	AF:	Antifoam was used

Prev		Prev	
Current		Current	
Total		Total	
Needs QC?		Needs QC?	

Total Metals by Method 6020 Summary Forms

6020 3015 DOD

- COVER PAGE -

INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc.

SDG No.: EPR-029 **Method Type:** 6020 3015 DOD **SOW No.:**

Contract: EPR029|Willow Grove **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
3058771002	03MW03S-20190916	
3058771003	03MW06SI-20190917	
3058771003S	03MW06SI-20190917S	Matrix Spike
3058771003SD	03MW06SI-20190917SD	Matrix Spike Duplicate
3058771004	03MW06S-20190917	
3058771005	03MW02S-20190917	
3058771006	03MW02I-20190917	
3058771007	03MW02SI-20190917	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **Matthew Olley**

Date: Title: **Metals Supervisor**

6020 3015 DOD

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-029

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092619D 030

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	0306																										
BLK	1.00	0309		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
STANDARD 5	1.00	0312		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0316																										
ZZZZZZ	1.00	0319																										
ICB	1.00	0322		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
LLICV	1.00	0325		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0333																										
ICV	1.00	0337		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0340																										
ICSAB	1.00	0343		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0347																										
ZZZZZZ	1.00	0350																										
ICSA	1.00	0353		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0356																										
MB for HBN 544196 [	1.00	0403		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
LCS for HBN 544196 [	1.00	0406		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW03S-20190916	1.00	0409		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW06SI-20190917	1.00	0413		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW06SI-20190917S	1.00	0416		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW06SI-20190917SD	1.00	0419		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW06S-20190917	1.00	0422		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW02S-20190917	1.00	0426		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW02I-20190917	1.00	0429		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW02SI-20190917	1.00	0432		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
CCV	1.00	0436		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
CCB	1.00	0439		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0443																										
ZZZZZZ	1.00	0446																										
ZZZZZZ	1.00	0450																										
ZZZZZZ	1.00	0453																										
ZZZZZZ	1.00	0456																										
ZZZZZZ	1.00	0500																										
ZZZZZZ	1.00	0503																										
ZZZZZZ	1.00	0506																										
ZZZZZZ	1.00	0510																										

6020 3015 DOD

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-029

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092619D 030

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	0513																								
ZZZZZZ	1.00	0516																								
ZZZZZZ	1.00	0519																								
ZZZZZZ	1.00	0524																								
ZZZZZZ	1.00	0527																								
ZZZZZZ	1.00	0530																								
ZZZZZZ	1.00	0534																								
ZZZZZZ	1.00	0537																								
ZZZZZZ	1.00	0540																								
ZZZZZZ	1.00	0544																								
ZZZZZZ	1.00	0550																								
ZZZZZZ	1.00	0555																								
ZZZZZZ	1.00	0558																								
ZZZZZZ	1.00	0601																								

6020 3015 DOD

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
LLICV										
	Aluminum	0.0767	0.0800	96		80 - 120	M	9/26/2019	03:25	A092619D 0
	Antimony	0.0021	0.0020	105		80 - 120	M	9/26/2019	03:25	A092619D 0
	Barium	0.0053	0.0050	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Beryllium	0.0011	0.0010	110		80 - 120	M	9/26/2019	03:25	A092619D 0
	Cadmium	0.0011	0.0010	110		80 - 120	M	9/26/2019	03:25	A092619D 0
	Calcium	0.1094	0.1000	109		80 - 120	M	9/26/2019	03:25	A092619D 0
	Chromium	0.0017	0.0020	85		80 - 120	M	9/26/2019	03:25	A092619D 0
	Cobalt	0.0049	0.0050	98		80 - 120	M	9/26/2019	03:25	A092619D 0
	Lead	0.0021	0.0020	105		80 - 120	M	9/26/2019	03:25	A092619D 0
	Magnesium	0.1073	0.1000	107		80 - 120	M	9/26/2019	03:25	A092619D 0
	Manganese	0.0052	0.0050	104		80 - 120	M	9/26/2019	03:25	A092619D 0
	Nickel	0.0053	0.0050	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Potassium	0.1161	0.1000	116		80 - 120	M	9/26/2019	03:25	A092619D 0
	Silver	0.0019	0.0020	95		80 - 120	M	9/26/2019	03:25	A092619D 0
	Sodium	0.1058	0.1000	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Thallium	0.0010	0.0010	100		80 - 120	M	9/26/2019	03:25	A092619D 0
	Vanadium	0.0018	0.0020	90		80 - 120	M	9/26/2019	03:25	A092619D 0
ICV										
	Aluminum	0.1007	0.1000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Antimony	0.0977	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Barium	0.1005	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Beryllium	0.1037	0.1000	104		90 - 110	M	9/26/2019	03:37	A092619D 0
	Cadmium	0.0996	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Calcium	1.0176	1.0000	102		90 - 110	M	9/26/2019	03:37	A092619D 0
	Chromium	0.1026	0.1000	103		90 - 110	M	9/26/2019	03:37	A092619D 0
	Cobalt	0.0981	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Lead	0.1007	0.1000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Magnesium	1.0453	1.0000	105		90 - 110	M	9/26/2019	03:37	A092619D 0
	Manganese	0.1062	0.1000	106		90 - 110	M	9/26/2019	03:37	A092619D 0
	Nickel	0.1060	0.1000	106		90 - 110	M	9/26/2019	03:37	A092619D 0
	Potassium	1.0438	1.0000	104		90 - 110	M	9/26/2019	03:37	A092619D 0
	Silver	0.1000	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Sodium	1.0114	1.0000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Thallium	0.0978	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Vanadium	0.1019	0.1000	102		90 - 110	M	9/26/2019	03:37	A092619D 0

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Aluminum	0.0944	0.1000	94		90 - 110	M	9/26/2019	04:36	A092619D 0
	Antimony	0.0949	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Barium	0.0970	0.1000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Beryllium	0.0948	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Cadmium	0.0958	0.1000	96		90 - 110	M	9/26/2019	04:36	A092619D 0
	Calcium	0.9715	1.0000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Chromium	0.0978	0.1000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Cobalt	0.0929	0.1000	93		90 - 110	M	9/26/2019	04:36	A092619D 0
	Lead	0.0991	0.1000	99		90 - 110	M	9/26/2019	04:36	A092619D 0
	Magnesium	1.0281	1.0000	103		90 - 110	M	9/26/2019	04:36	A092619D 0
	Manganese	0.1016	0.1000	102		90 - 110	M	9/26/2019	04:36	A092619D 0
	Nickel	0.0977	0.1000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Potassium	1.0167	1.0000	102		90 - 110	M	9/26/2019	04:36	A092619D 0
	Silver	0.0972	0.1000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Sodium	0.9842	1.0000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Thallium	0.0952	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Vanadium	0.0964	0.1000	96		90 - 110	M	9/26/2019	04:36	A092619D 0
ICV										
	Arsenic	0.1044	0.1000	104		90 - 110	M	9/27/2019	00:05	A092719 23
	Barium	0.0959	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Copper	0.0960	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Iron	0.9528	1.0000	95		90 - 110	M	9/27/2019	00:05	A092719 23
	Selenium	0.1021	0.1000	102		90 - 110	M	9/27/2019	00:05	A092719 23
	Zinc	0.0938	0.1000	94		90 - 110	M	9/27/2019	00:05	A092719 23
LLICV										
	Arsenic	0.0030	0.0030	100		80 - 120	M	9/27/2019	00:15	A092719 23
	Barium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Copper	0.0047	0.0050	94		80 - 120	M	9/27/2019	00:15	A092719 23
	Iron	0.0428	0.0500	86		80 - 120	M	9/27/2019	00:15	A092719 23
	Selenium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Zinc	0.0053	0.0050	106		80 - 120	M	9/27/2019	00:15	A092719 23

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	03:22	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	03:22	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	03:22	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Thallium	0.0010	U	0.00066	0.0003	0.0010	M	9/26/2019	03:22	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	04:39	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	04:39	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	04:39	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Thallium	0.0005	J	0.00066	0.0003	0.0010	M	9/26/2019	04:39	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
ICB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	00:11	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	00:11	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
CCB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	01:40	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	01:40	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (

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INTERFERENCE CHECK SAMPLE

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

ICS Source: Inorganic Ventures **Instrument ID:** AGILENT 7700 ICPMS

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	Analysis Date	Analysis Time	Run Number
ICSAB									
	Aluminum	88.1	100.0000	88		80 - 120%	9/26/2019	03:43	A092619D 03
	Antimony	0.0005				-0.00200 - -0.00200	9/26/2019	03:43	A092619D 03
	Barium	0.0007				-0.00500 - -0.00500	9/26/2019	03:43	A092619D 03
	Beryllium	0.00000				-0.001000 - -0.001000	9/26/2019	03:43	A092619D 03
	Cadmium	0.0102	0.01000	102		80 - 120%	9/26/2019	03:43	A092619D 03
	Calcium	91.0	100.0000	91		80 - 120%	9/26/2019	03:43	A092619D 03
	Chromium	0.0190	0.02000	95		80 - 120%	9/26/2019	03:43	A092619D 03
	Cobalt	0.0349	0.04000	87		80 - 120%	9/26/2019	03:43	A092619D 03
	Lead	0.0001				-0.00200 - -0.00200	9/26/2019	03:43	A092619D 03
	Magnesium	98.5871	100.00000	99		80 - 120%	9/26/2019	03:43	A092619D 03
	Manganese	0.0201	0.02000	100		80 - 120%	9/26/2019	03:43	A092619D 03
	Nickel	0.0367	0.04000	92		80 - 120%	9/26/2019	03:43	A092619D 03
	Potassium	99.1147	100.00000	99		80 - 120%	9/26/2019	03:43	A092619D 03
	Silver	0.0189	0.02000	94		80 - 120%	9/26/2019	03:43	A092619D 03
	Sodium	95.8801	100.00000	96		80 - 120%	9/26/2019	03:43	A092619D 03
	Thallium	0.00005				-0.001000 - -0.001000	9/26/2019	03:43	A092619D 03
	Vanadium	0.0382	0.04000	96		80 - 120%	9/26/2019	03:43	A092619D 03

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INTERFERENCE CHECK SAMPLE

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

ICS Source: Inorganic Ventures **Instrument ID:** AGILENT 7700 ICPMS

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	Analysis Date	Analysis Time	Run Number
ICSA									
	Aluminum	83.7	100.0000	84		80 - 120%	9/26/2019	03:53	A092619D 03
	Antimony	0.0002				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Barium	0.0005				-0.02000 - -0.02000	9/26/2019	03:53	A092619D 03
	Beryllium	0.00000				-0.002000 - -0.002000	9/26/2019	03:53	A092619D 03
	Cadmium	0.0010				-0.00200 - -0.00200	9/26/2019	03:53	A092619D 03
	Calcium	85.7	100.0000	86		80 - 120%	9/26/2019	03:53	A092619D 03
	Chromium	0.0000				-0.00800 - -0.00800	9/26/2019	03:53	A092619D 03
	Cobalt	0.0006				-0.01200 - -0.01200	9/26/2019	03:53	A092619D 03
	Lead	0.0001				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Magnesium	95.9195	100.00000	96		80 - 120%	9/26/2019	03:53	A092619D 03
	Manganese	0.0012				-0.02000 - -0.02000	9/26/2019	03:53	A092619D 03
	Nickel	0.0012				-0.01000 - -0.01000	9/26/2019	03:53	A092619D 03
	Potassium	97.9671	100.00000	98		80 - 120%	9/26/2019	03:53	A092619D 03
	Silver	0.0000				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Sodium	93.6543	100.00000	94		80 - 120%	9/26/2019	03:53	A092619D 03
	Thallium	0.00001				-0.002000 - -0.002000	9/26/2019	03:53	A092619D 03
	Vanadium	-0.0001				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
ICSA									
	Arsenic	0.0002				-0.00600 - -0.00600	9/27/2019	00:28	A092719 2355
	Barium	0.0005				-0.02000 - -0.02000	9/27/2019	00:28	A092719 2355
	Copper	0.0012				-0.01000 - -0.01000	9/27/2019	00:28	A092719 2355
	Iron	85.4397	100.00000	85		80 - 120%	9/27/2019	00:28	A092719 2355
	Selenium	0.0003				-0.01000 - -0.01000	9/27/2019	00:28	A092719 2355
	Zinc	0.0017				-0.02000 - -0.02000	9/27/2019	00:28	A092719 2355
ICSAB									
	Arsenic	0.0196	0.02000	98		80 - 120%	9/27/2019	00:31	A092719 2355
	Barium	0.0007				-0.00500 - -0.00500	9/27/2019	00:31	A092719 2355
	Copper	0.0175	0.02000	88		80 - 120%	9/27/2019	00:31	A092719 2355
	Iron	96.1664	100.00000	96		80 - 120%	9/27/2019	00:31	A092719 2355
	Selenium	0.0226	0.02000	113		80 - 120%	9/27/2019	00:31	A092719 2355
	Zinc	0.0188	0.02000	94		80 - 120%	9/27/2019	00:31	A092719 2355

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-029

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/26/2019

Sample No.	Client ID	Time	Internal Standards %RI For:													
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
BLK	ZZZZZZ	0306												
BLK	BLK	0309	100		100		100		100		100		100	
STANDARD 5	STANDARD 5	0312	109		108		107		113		112		110	
ICV	ZZZZZZ	0316												
ICB1	ZZZZZZ	0319												
ICB2	ICB	0322	98		100		99		105		105		99	
LLICV	LLICV	0325	100		102		100		103		105		101	
ICV	ZZZZZZ	0333												
ICV	ICV	0337	106		106		100		104		109		106	
ICS-A1	ZZZZZZ	0340												
ICS-AB1	ICSAB	0343	96		101		108		112		116		105	
CHECK	ZZZZZZ	0347												
CHECK	ZZZZZZ	0350												
ICS-A2	ICSA	0353	97		103		117		119		123	*	107	
CHECK	ZZZZZZ	0356												
3017605	MB for HBN 54419	0403	103		104		104		106		110		104	
3017606	LCS for HBN 5441	0406	110		113		109		114		115		113	
3058771002	03MW03S-20190916	0409	106		108		105		107		108		108	
3058771003	03MW06SI-2019091	0413	105		105		101		98		107		104	
3058771003S	03MW06SI-2019091	0416	110		111		109		112		114		112	
3058771003S	03MW06SI-2019091	0419	109		110		108		111		115		111	
3058771004	03MW06S-20190917	0422	106		109		107		108		110		109	
3058771005	03MW02S-20190917	0426	107		108		109		109		115		108	
3058771006	03MW02I-20190917	0429	106		109		109		110		111		108	
3058771007	03MW02SI-2019091	0432	102		103		104		89		103		102	
CCV1	CCV	0436	113		114		112		112		119		115	
CCB1	CCB	0439	106		108		106		105		110		108	
3017605	ZZZZZZ	0443												
3059231002	ZZZZZZ	0446												
3059231003	ZZZZZZ	0450												
3059231004	ZZZZZZ	0453												
3059231005	ZZZZZZ	0456												
3059231006	ZZZZZZ	0500												
3059231007	ZZZZZZ	0503												
3059275002	ZZZZZZ	0506												
3059275003	ZZZZZZ	0510												
3059275004	ZZZZZZ	0513												
CCV2	ZZZZZZ	0516												
CCB2	ZZZZZZ	0519												
CCV3	ZZZZZZ	0524												
CCV4	ZZZZZZ	0527												
3059275005	ZZZZZZ	0530												
3053278004	ZZZZZZ	0534												
3053278005	ZZZZZZ	0537												

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-029

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/26/2019

Sample No.	Client ID	Time	Internal Standards %RI For:											
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
3053278006	ZZZZZZ	0540												
3059836021	ZZZZZZ	0544												
LDR	ZZZZZZ	0550												
CHECK	ZZZZZZ	0555												
CCV5	ZZZZZZ	0558												
CCB3	ZZZZZZ	0601												

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-029

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092719 2355

Start Date: 9/26/2019 End Date: 9/27/2019

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	2355																												
BLK	1.00	2358				X	X						X	X							X					X				
STANDARD 5	1.00	0002				X	X						X	X							X					X				
ICV	1.00	0005				X	X						X	X							X					X				
ZZZZZZ	1.00	0008																												
ICB	1.00	0011				X	X						X	X							X					X				
LLICV	1.00	0015				X	X						X	X							X					X				
ICSA	1.00	0028				X	X						X	X							X					X				
ICSAB	1.00	0031				X	X						X	X							X					X				
ZZZZZZ	1.00	0034																												
ZZZZZZ	1.00	0046																												
ZZZZZZ	1.00	0049																												
ZZZZZZ	1.00	0058																												
MB for HBN 544196 [	1.00	0104				X							X	X							X									
LCS for HBN 544196 [	1.00	0107				X							X	X							X					X				
03MW03S-20190916	1.00	0111				X							X	X							X					X				
03MW06SI-20190917	1.00	0114				X							X	X							X					X				
03MW06SI-20190917S	1.00	0117				X							X	X							X					X				
03MW06SI-20190917SD	1.00	0120				X							X	X							X					X				
03MW06S-20190917	1.00	0124				X							X	X							X					X				
03MW02S-20190917	1.00	0127				X							X	X							X					X				
03MW02I-20190917	1.00	0130				X	X						X	X							X					X				
03MW02SI-20190917	1.00	0133				X	X						X	X							X					X				
CCV	1.00	0137				X	X						X	X							X					X				
CCB	1.00	0140				X	X						X	X							X					X				
ZZZZZZ	1.00	0148																												
ZZZZZZ	1.00	0151																												
ZZZZZZ	1.00	0155																												
ZZZZZZ	1.00	0158																												
ZZZZZZ	1.00	0201																												
ZZZZZZ	1.00	0205																												
ZZZZZZ	1.00	0208																												
ZZZZZZ	1.00	0211																												
ZZZZZZ	1.00	0214																												
ZZZZZZ	1.00	0218																												
CCV	1.00	0221																								X				

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-029

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092719 2355

Start Date: 9/26/2019 End Date: 9/27/2019

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCB	1.00	0224																							X	
ZZZZZZ	1.00	0228																								
ZZZZZZ	1.00	0231																								
ZZZZZZ	1.00	0236																								
ZZZZZZ	1.00	0239																								
ZZZZZZ	1.00	0245																								
ZZZZZZ	10.00	0251																								
MB for HBN 544196 [	1.00	0254																							X	
CCV	1.00	0258																							X	
CCB	1.00	0301																							X	

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Aluminum	0.0944	0.1000	94		90 - 110	M	9/26/2019	04:36	A092619D 0
	Antimony	0.0949	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Barium	0.0970	0.1000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Beryllium	0.0948	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Cadmium	0.0958	0.1000	96		90 - 110	M	9/26/2019	04:36	A092619D 0
	Calcium	0.9715	1.0000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Chromium	0.0978	0.1000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Cobalt	0.0929	0.1000	93		90 - 110	M	9/26/2019	04:36	A092619D 0
	Lead	0.0991	0.1000	99		90 - 110	M	9/26/2019	04:36	A092619D 0
	Magnesium	1.0281	1.0000	103		90 - 110	M	9/26/2019	04:36	A092619D 0
	Manganese	0.1016	0.1000	102		90 - 110	M	9/26/2019	04:36	A092619D 0
	Nickel	0.0977	0.1000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Potassium	1.0167	1.0000	102		90 - 110	M	9/26/2019	04:36	A092619D 0
	Silver	0.0972	0.1000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Sodium	0.9842	1.0000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Thallium	0.0952	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Vanadium	0.0964	0.1000	96		90 - 110	M	9/26/2019	04:36	A092619D 0
ICV										
	Arsenic	0.1044	0.1000	104		90 - 110	M	9/27/2019	00:05	A092719 23
	Barium	0.0959	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Copper	0.0960	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Iron	0.9528	1.0000	95		90 - 110	M	9/27/2019	00:05	A092719 23
	Selenium	0.1021	0.1000	102		90 - 110	M	9/27/2019	00:05	A092719 23
	Zinc	0.0938	0.1000	94		90 - 110	M	9/27/2019	00:05	A092719 23
LLICV										
	Arsenic	0.0030	0.0030	100		80 - 120	M	9/27/2019	00:15	A092719 23
	Barium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Copper	0.0047	0.0050	94		80 - 120	M	9/27/2019	00:15	A092719 23
	Iron	0.0428	0.0500	86		80 - 120	M	9/27/2019	00:15	A092719 23
	Selenium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Zinc	0.0053	0.0050	106		80 - 120	M	9/27/2019	00:15	A092719 23

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Arsenic	0.1037	0.1000	104		90 - 110	M	9/27/2019	01:37	A092719 23
	Barium	0.0957	0.1000	96		90 - 110	M	9/27/2019	01:37	A092719 23
	Copper	0.0944	0.1000	94		90 - 110	M	9/27/2019	01:37	A092719 23
	Iron	0.9482	1.0000	95		90 - 110	M	9/27/2019	01:37	A092719 23
	Selenium	0.1003	0.1000	100		90 - 110	M	9/27/2019	01:37	A092719 23
	Zinc	0.0950	0.1000	95		90 - 110	M	9/27/2019	01:37	A092719 23
CCV										
	Zinc	0.0977	0.1000	98		90 - 110	M	9/27/2019	02:21	A092719 23
CCV										
	Zinc	0.0970	0.1000	97		90 - 110	M	9/27/2019	02:58	A092719 23

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	04:39	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	04:39	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	04:39	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Thallium	0.0005	J	0.00066	0.0003	0.0010	M	9/26/2019	04:39	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
ICB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	00:11	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	00:11	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
CCB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	01:40	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	01:40	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
CCB	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	03:01	A092719 2355 (

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INTERFERENCE CHECK SAMPLE

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

ICS Source: Inorganic Ventures **Instrument ID:** AGILENT 7700 ICPMS

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	Analysis Date	Analysis Time	Run Number
ICSA									
	Aluminum	83.7	100.0000	84		80 - 120%	9/26/2019	03:53	A092619D 03
	Antimony	0.0002				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Barium	0.0005				-0.02000 - -0.02000	9/26/2019	03:53	A092619D 03
	Beryllium	0.00000				-0.002000 - -0.002000	9/26/2019	03:53	A092619D 03
	Cadmium	0.0010				-0.00200 - -0.00200	9/26/2019	03:53	A092619D 03
	Calcium	85.7	100.0000	86		80 - 120%	9/26/2019	03:53	A092619D 03
	Chromium	0.0000				-0.00800 - -0.00800	9/26/2019	03:53	A092619D 03
	Cobalt	0.0006				-0.01200 - -0.01200	9/26/2019	03:53	A092619D 03
	Lead	0.0001				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Magnesium	95.9195	100.00000	96		80 - 120%	9/26/2019	03:53	A092619D 03
	Manganese	0.0012				-0.02000 - -0.02000	9/26/2019	03:53	A092619D 03
	Nickel	0.0012				-0.01000 - -0.01000	9/26/2019	03:53	A092619D 03
	Potassium	97.9671	100.00000	98		80 - 120%	9/26/2019	03:53	A092619D 03
	Silver	0.0000				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Sodium	93.6543	100.00000	94		80 - 120%	9/26/2019	03:53	A092619D 03
	Thallium	0.00001				-0.002000 - -0.002000	9/26/2019	03:53	A092619D 03
	Vanadium	-0.0001				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
ICSA									
	Arsenic	0.0002				-0.00600 - -0.00600	9/27/2019	00:28	A092719 2355
	Barium	0.0005				-0.02000 - -0.02000	9/27/2019	00:28	A092719 2355
	Copper	0.0012				-0.01000 - -0.01000	9/27/2019	00:28	A092719 2355
	Iron	85.4397	100.00000	85		80 - 120%	9/27/2019	00:28	A092719 2355
	Selenium	0.0003				-0.01000 - -0.01000	9/27/2019	00:28	A092719 2355
	Zinc	0.0017				-0.02000 - -0.02000	9/27/2019	00:28	A092719 2355
ICSAB									
	Arsenic	0.0196	0.02000	98		80 - 120%	9/27/2019	00:31	A092719 2355
	Barium	0.0007				-0.00500 - -0.00500	9/27/2019	00:31	A092719 2355
	Copper	0.0175	0.02000	88		80 - 120%	9/27/2019	00:31	A092719 2355
	Iron	96.1664	100.00000	96		80 - 120%	9/27/2019	00:31	A092719 2355
	Selenium	0.0226	0.02000	113		80 - 120%	9/27/2019	00:31	A092719 2355
	Zinc	0.0188	0.02000	94		80 - 120%	9/27/2019	00:31	A092719 2355

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-029

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/27/2019

Sample No.	Client ID	Time	Internal Standards %RI For:											
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
BLK	ZZZZZZ	2355												
BLK	BLK	2358	100		100		100		100		100		100	
STANDARD 5	STANDARD 5	0002	104		101		99		108		101		104	
ICV	ICV	0005	108		108		104		107		102		110	
ICB1	ZZZZZZ	0008												
ICB2	ICB	0011	98		98		101		100		98		100	
LLICV	LLICV	0015	103		102		103		104		99		103	
ICS-A1	ICSA	0028	92		97		113		115		111		100	
ICS-AB1	ICSAB	0031	96		100		110		112		107		106	
CHECK	ZZZZZZ	0034												
CHECK	ZZZZZZ	0046												
LDR	ZZZZZZ	0049												
CHECK	ZZZZZZ	0058												
3017605	MB for HBN 54419	0104	103		103		103		105		102		105	
3017606	LCS for HBN 5441	0107	109		110		106		110		104		112	
3058771002	03MW03S-20190916	0111	105		105		103		107		97		106	
3058771003	03MW06SI-2019091	0114	104		103		103		103		105		105	
3058771003S	03MW06SI-2019091	0117	109		108		106		102		105		110	
3058771003S	03MW06SI-2019091	0120	107		106		102		109		108		109	
3058771004	03MW06S-20190917	0124	108		110		112		108		99		111	
3058771005	03MW02S-20190917	0127	108		111		112		104		101		111	
3058771006	03MW02I-20190917	0130	94		95		96		105		104		96	
3058771007	03MW02SI-2019091	0133	102		105		105		107		104		108	
CCV1	CCV	0137	115		116		111		112		106		119	
CCB1	CCB	0140	104		104		104		106		103		106	
3059231002	ZZZZZZ	0148												
3059231003	ZZZZZZ	0151												
3059231004	ZZZZZZ	0155												
3059231005	ZZZZZZ	0158												
3059231006	ZZZZZZ	0201												
3059231007	ZZZZZZ	0205												
3059275002	ZZZZZZ	0208												
3059275003	ZZZZZZ	0211												
3059275004	ZZZZZZ	0214												
3059275005	ZZZZZZ	0218												
CCV2	CCV	0221	108		107		102		106		103		109	
CCB2	CCB	0224	101		101		98		102		98		103	
3017605	ZZZZZZ	0228												
3053278004	ZZZZZZ	0231												
3053278005	ZZZZZZ	0236												
3053278006	ZZZZZZ	0239												
3059836032	ZZZZZZ	0245												
3059836032	ZZZZZZ	0251												
3017605	MB for HBN 54419	0254	96		97		98		101		97		97	

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-029

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/27/2019

Sample No.	Client ID	Time	Internal Standards %RI For:											
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
CCV3	CCV	0258	105		104		101		105		100		107	
CCB3	CCB	0301	100		100		99		102		98		104	

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SAMPLE PREPARATION SUMMARY

Client: Earth Toxics Inc.

SDG No.: EPR-029

Contract: EPR029|Willow Grove Sites **Lab Code:** ALS

Method: MS

3 an

Case No.: WE04 **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	544196						
3017605	MB for HBN 544196 [MDIG/8007	MB	QC-WAT	9/25/19	45.0	50.0	
3017606	LCS for HBN 544196 [MDIG/8007	LCS	QC-WAT	9/25/19	45.0	50.0	
3058771002	03MW03S-20190916	SAM	WATER	9/25/19	45.0	50.0	
3058771003	03MW06SI-20190917	SAM	WATER	9/25/19	45.0	50.0	
3058771003S	03MW06SI-20190917S	MS	WATER	9/25/19	45.0	50.0	
3058771003SD	03MW06SI-20190917SD	MSD	WATER	9/25/19	45.0	50.0	
3058771004	03MW06S-20190917	SAM	WATER	9/25/19	45.0	50.0	
3058771005	03MW02S-20190917	SAM	WATER	9/25/19	45.0	50.0	
3058771006	03MW02I-20190917	SAM	WATER	9/25/19	45.0	50.0	
3058771007	03MW02SI-20190917	SAM	WATER	9/25/19	45.0	50.0	

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PREPARATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result (mg/L)	Conc Qual	Q	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
3017605			**QC-WATER**								
	Aluminum	0.0889	U		0.044	0.0300	0.0889	M	9/26/2019	04:03	A092619D 0306
	Antimony	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Arsenic	0.00333	U		0.0017	0.00100	0.00333	M	9/27/2019	01:04	A092719 2355 (
	Barium	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 0306
	Beryllium	0.001111	U		0.0006	0.000300	0.001111	M	9/26/2019	04:03	A092619D 0306
	Cadmium	0.00111	U		0.0006	0.00037	0.00111	M	9/26/2019	04:03	A092619D 0306
	Calcium	0.1111	U		0.056	0.0370	0.1111	M	9/26/2019	04:03	A092619D 0306
	Chromium	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Cobalt	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 0306
	Copper	0.00282	J		0.0028	0.00185	0.00556	M	9/27/2019	01:04	A092719 2355 (
	Iron	0.05556	U		0.028	0.01900	0.05556	M	9/27/2019	01:04	A092719 2355 (
	Lead	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Magnesium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 0306
	Manganese	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 0306
	Nickel	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 0306
	Potassium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 0306
	Selenium	0.00556	U		0.0028	0.00190	0.00556	M	9/27/2019	01:04	A092719 2355 (
	Silver	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Sodium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 0306
	Thallium	0.00111	U		0.0006	0.00030	0.00111	M	9/26/2019	04:03	A092619D 0306
	Vanadium	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Zinc	0.00308	J		0.0028	0.00185	0.00556	M	9/27/2019	02:54	A092719 2355 (

6020 3015 DOD

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Aqueous LCS Source: Inorganic Ventures **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Q	QC Criteria	M
3017606									
	Aluminum	mg/L	2.2220	2.0996		94		84 - 117	M
	Antimony	mg/L	0.2220	0.2183		98		85 - 117	M
	Arsenic	mg/L	0.2220	0.2333		105		84 - 116	M
	Barium	mg/L	2.2220	2.2180		100		86 - 114	M
	Beryllium	mg/L	0.2220	0.2205		99		83 - 121	M
	Cadmium	mg/L	0.2220	0.2194		99		87 - 115	M
	Calcium	mg/L	2.2220	2.2558		102		87 - 118	M
	Chromium	mg/L	0.2220	0.2230		100		85 - 116	M
	Cobalt	mg/L	0.2220	0.2189		99		86 - 115	M
	Copper	mg/L	0.2220	0.2192		99		85 - 118	M
	Iron	mg/L	2.2220	2.2637		102		87 - 118	M
	Lead	mg/L	0.2220	0.2284		103		88 - 115	M
	Magnesium	mg/L	2.2220	2.2413		101		83 - 118	M
	Manganese	mg/L	0.2220	0.2275		102		87 - 115	M
	Nickel	mg/L	0.2220	0.2283		103		85 - 117	M
	Potassium	mg/L	2.2220	2.2851		103		87 - 115	M
	Selenium	mg/L	0.2220	0.2229		100		80 - 120	M
	Silver	mg/L	0.1110	0.1083		98		85 - 116	M
	Sodium	mg/L	2.2220	2.2898		103		85 - 117	M
	Thallium	mg/L	0.2220	0.2294		103		82 - 116	M
	Vanadium	mg/L	0.2220	0.2237		101		86 - 115	M
	Zinc	mg/L	0.2220	0.2153		97		83 - 119	M

6020 3015 DOD

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MATRIX SPIKE SUMMARY

Client: Earth Toxics Inc. **Level:** Low **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Matrix: WATER **Sample ID:** 3058771003 **Client ID:** 03MW06SI-20190917S **LIMS ID:** 3017608

Percent Solids for Sample: 0.00 **Spiked ID:** 3058771003S **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Aluminum	mg/L	84 - 117	2.08		0.09	U	2.222	94		M
Antimony	mg/L	85 - 117	0.22		0.00		0.222	99		M
Arsenic	mg/L	84 - 116	0.224		0.003	U	0.222	101		M
Barium	mg/L	86 - 114	2.253		0.110		2.222	96		M
Beryllium	mg/L	83 - 121	0.21539		0.00111	U	0.22222	97		M
Cadmium	mg/L	87 - 115	0.216		0.000		0.222	97		M
Calcium	mg/L	87 - 118	11.97		10.75		2.22	NSC		M
Chromium	mg/L	85 - 116	0.224		0.005		0.222	99		M
Cobalt	mg/L	86 - 115	0.211		0.006	U	0.222	95		M
Copper	mg/L	85 - 118	0.212		0.002		0.222	95		M
Iron	mg/L	87 - 118	2.255		0.040		2.222	100		M
Lead	mg/L	88 - 115	0.223		0.002	U	0.222	100		M
Magnesium	mg/L	83 - 118	5.527		3.684		2.222	83		M
Manganese	mg/L	87 - 115	0.224		0.004		0.222	99		M
Nickel	mg/L	85 - 117	0.223		0.005		0.222	98		M
Potassium	mg/L	87 - 115	3.304		1.103		2.222	99		M
Selenium	mg/L	80 - 120	0.217		0.006	U	0.222	98		M
Silver	mg/L	85 - 116	0.106		0.002	U	0.111	95		M
Sodium	mg/L	85 - 117	12.203		11.247		2.222	NSC		M
Thallium	mg/L	82 - 116	0.2210		0.0011	U	0.2222	99		M
Vanadium	mg/L	86 - 115	0.220		0.002	U	0.222	99		M
Zinc	mg/L	83 - 119	0.211		0.004		0.222	93		M

6020 3015 DOD

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MATRIX SPIKE DUPLICATE SUMMARY

Client: Earth Toxics Inc. **Level:** Low **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Matrix: WATER **Sample ID:** 3058771003 **Client ID:** 03MW06SI-20190917SD **LIMS ID:** 3017609

Percent Solids for Sample: 0.00 **Spiked ID:** 3058771003SD **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Aluminum	mg/L	84 - 117	2.14		0.09	U	2.222	96		M
Antimony	mg/L	85 - 117	0.22		0.00		0.222	99		M
Arsenic	mg/L	84 - 116	0.221		0.003	U	0.222	100		M
Barium	mg/L	86 - 114	2.357		0.110		2.222	101		M
Beryllium	mg/L	83 - 121	0.22483		0.00111	U	0.22222	101		M
Cadmium	mg/L	87 - 115	0.223		0.000		0.222	100		M
Calcium	mg/L	87 - 118	12.18		10.75		2.22	NSC		M
Chromium	mg/L	85 - 116	0.234		0.005		0.222	103		M
Cobalt	mg/L	86 - 115	0.221		0.006	U	0.222	100		M
Copper	mg/L	85 - 118	0.219		0.002		0.222	98		M
Iron	mg/L	87 - 118	2.255		0.040		2.222	100		M
Lead	mg/L	88 - 115	0.231		0.002	U	0.222	104		M
Magnesium	mg/L	83 - 118	5.606		3.684		2.222	86		M
Manganese	mg/L	87 - 115	0.239		0.004		0.222	106		M
Nickel	mg/L	85 - 117	0.231		0.005		0.222	102		M
Potassium	mg/L	87 - 115	3.340		1.103		2.222	101		M
Selenium	mg/L	80 - 120	0.213		0.006	U	0.222	96		M
Silver	mg/L	85 - 116	0.110		0.002	U	0.111	99		M
Sodium	mg/L	85 - 117	12.229		11.247		2.222	NSC		M
Thallium	mg/L	82 - 116	0.2320		0.0011	U	0.2222	104		M
Vanadium	mg/L	86 - 115	0.231		0.002	U	0.222	104		M
Zinc	mg/L	83 - 119	0.219		0.004		0.222	97		M

6020 3015 DOD

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DUPLICATE SAMPLE SUMMARY

Client: Earth Toxics Inc. **Level:** Low **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Matrix: WATER **Sample ID:** 3058771003S **Client ID:** 03MW06SI-20190917SD **LIMS ID:** 3017609

Percent Solids for Sample: 0.00 **Duplicate ID:** 3058771003SD **Percent Solids for Duplicate:** 0.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Aluminum	mg/L	0 - 20	2.08		2.14		2.84		M
Antimony	mg/L	0 - 20	0.22		0.22		0		M
Arsenic	mg/L	0 - 20	0.224		0.221		1		M
Barium	mg/L	0 - 20	2.253		2.357		5		M
Beryllium	mg/L	0 - 20	0.21539		0.22483		4		M
Cadmium	mg/L	0 - 20	0.216		0.223		3		M
Calcium	mg/L	0 - 20	11.97		12.18		2		M
Chromium	mg/L	0 - 20	0.224		0.234		4		M
Cobalt	mg/L	0 - 20	0.211		0.221		5		M
Copper	mg/L	0 - 20	0.212		0.219		3		M
Iron	mg/L	0 - 20	2.255		2.255		0		M
Lead	mg/L	0 - 20	0.223		0.231		4		M
Magnesium	mg/L	0 - 20	5.527		5.606		1		M
Manganese	mg/L	0 - 20	0.224		0.239		6		M
Nickel	mg/L	0 - 20	0.223		0.231		4		M
Potassium	mg/L	0 - 20	3.304		3.340		1		M
Selenium	mg/L	0 - 20	0.217		0.213		2		M
Silver	mg/L	0 - 20	0.106		0.110		4		M
Sodium	mg/L	0 - 20	12.203		12.229		0		M
Thallium	mg/L	0 - 20	0.2210		0.2320		5		M
Vanadium	mg/L	0 - 20	0.220		0.231		5		M
Zinc	mg/L	0 - 20	0.211		0.219		4		M

Microwave 3015 Prep (Water) (Version 2- 11/12/2015)

Note: All TCLP matrix spikes are spiked prior to preservation as noted in the TCLP logbook.

Batch: 80070	**Queue:** MDIG	**HBN:** 544196	**RULE:** D3015/6020	**ALSI SOP:**	09-3015
File Name: 80070_190925-200808			**METHOD:** 3015	**Microwave ID:**	MWV-1

Batch Type:	**Comment Codes:**	**Reagents:**		**Pipettes:**		**Start**	**Finish**
T: TCLP	1. Sample failed initial digestion due to a weight loss >5g	HNO3:	190124005	03-345	**Date:**	09/25/2019	09/25/2019
S: SPLP	2. Sample reacts with reagent	HCL:	180920001	03-306	**Time:**	20:15:00	20:45:00
M: 6020	3. Less sample used due to high metal content	Balance ID:	BAL-11	03-309	**Tech:**	SXC	SXC
W: 6010	4. Less sample used to result in successful microwave digestion				**Reviewed/Approved By:**		
A: ASTM	5. Sample does not digest by microwave, digest by method 3050				**Date:**		

Sample ID	Cont ID	Samp Type	Vessel Initial WT, grams	Vessel Final WT, grams	Difference grams	Spike Amt uL of Each	Spike Lot#	Sample Size, mL	Final Vol mL	Batch Type	Parent Sample ID	Comment Code
3017605		MB	210.316	210.289	0.027			45	50	M		
3017606		LCS	212.242	212.218	0.024	40/50/50/50/50	010/190125008/190	45	50	M		
3058771002	C	S	209.851	209.755	0.096			45	50	M		
3058771003	G	S	211.393	211.364	0.029			45	50	M		
3017608		MS	212.050	211.994	0.056	40/50/50/50/50	010/190125008/190	45	50	M	3058771003	
3017609		MSD	212.257	212.197	0.060	40/50/50/50/50	010/190125008/190	45	50	M	3058771003	
3058771004	C	S	210.415	210.322	0.093			45	50	M		
3058771005	C	S	212.189	212.117	0.072			45	50	M		
3058771006	C	S	210.425	210.389	0.036			45	50	M		
3058771007	C	S	211.901	211.821	0.080			45	50	M		
3059231002	C	S	212.525	212.483	0.042			45	50	M		
3059231003	C	S	210.563	210.500	0.063			45	50	M		
3059231004	C	S	213.186	213.160	0.026			45	50	M		
3059231005	C	S	213.609	213.547	0.062			45	50	M		
3059231006	C	S	210.148	210.097	0.051			45	50	M		
3059231007	C	S	211.586	211.523	0.063			45	50	M		
3059275002	C	S	211.634	211.575	0.059			45	50	M		
3059275003	C	S	212.550	212.487	0.063			45	50	M		
3059275004	C	S	212.239	212.197	0.042			45	50	M		
3059275005	C	S	212.987	212.916	0.071			45	50	M		
3053278004	A	S	210.156	210.113	0.043			45	50	M		
3053278005	A	S	211.520	211.487	0.033			45	50	M		
3053278006	A	S	210.897	210.833	0.064			45	50	M		
3059836032	A	S	211.551	211.519	0.032			45	50	M		

End

Total Mercury by Method 7470 Summary Forms

7470 DOD
- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc.

SDG No.: EPR-029 **Method Type:** 7470 DOD **SOW No.:**

Contract: EPR029|Willow Grove **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
3058771002	03MW03S-20190916	
3058771003	03MW06SI-20190917	
3058771003S	03MW06SI-20190917S	Matrix Spike
3058771003SD	03MW06SI-20190917SD	Matrix Spike Duplicate
3058771004	03MW06S-20190917	
3058771005	03MW02S-20190917	
3058771006	03MW02I-20190917	
3058771007	03MW02SI-20190917	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **Matthew Olley**

Date: Title: **Metals Supervisor**

Report Generated By Teledyne Leeman QuickTrace

Analyst: ALMDT.NoUser

Worksheet file: C:\Users\Public\Documents\Teledyne CETAC\QuickTrace\Worksheets\092019W.wszf

Creation Date: 9/20/2019 2:28:41 PM

Comment:
REVIEWED BY AHI 9/20/19 17:45

APPROVED
By Meghan Pettis at 7:09 am, Sep 23, 2019

Results

Sample Name	Type	Date/Time	Conc (ug/L)	µAbs	Residual	Flags	DF	% Recovery
Calibration Blank	STD	09/20/19 03:55:15 pm	0.000	686	40.06		1.00	N/A
Replicates	679.2	696.0	672.2	696.0				
Standard #1 (0.2 ug/L)	STD	09/20/19 03:56:28 pm	0.200	3011	8.54		1.00	N/A
Replicates	2963.8	3002.7	2966.8	3109.8				
Standard #2 (1 ug/L)	STD	09/20/19 03:57:40 pm	1.000	14216	20.60		1.00	N/A
Replicates	13883.0	14048.2	14255.9	14678.5				
Standard #3 (2 ug/L)	STD	09/20/19 03:58:53 pm	2.000	28434	50.93		1.00	N/A
Replicates	27430.3	28076.0	28745.9	29484.2				
Standard #4 (4 ug/L)	STD	09/20/19 04:00:06 pm	4.000	52852	-179.52		1.00	N/A
Replicates	51360.6	52140.5	53217.7	54690.7				
Standard #5 (10 ug/L)	STD	09/20/19 04:01:20 pm	10.000	138944	59.39		1.00	N/A
Replicates	135117.5	138367.5	140438.9	141851.0				

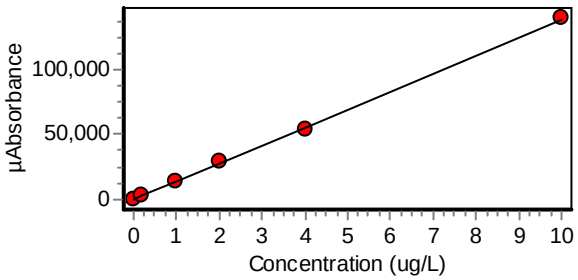
Calibration

Equation: Abs = 13799.114x + 133.083

R2: 0.99944

SEE: 1387.6280

Flags:



ICV	ICV	09/20/19 04:02:34 pm	3.910	54138			1.00	97.84
Replicates	52789.5	53508.7	54427.4	55824.4				
ICB	ICB	09/20/19 04:03:48 pm	0.003	168			1.00	N/A
Replicates	181.9	169.1	159.4	160.1				
LLCCV (LOQ)	UNK	09/20/19 04:04:59 pm	0.425	6002			1.00	N/A
Replicates	5991.8	5941.8	5970.8	6105.1				
3015011	UNK	09/20/19 04:06:11 pm	0.002	167			1.00	N/A
Replicates	126.8	211.5	182.1	148.8				
3015012	UNK	09/20/19 04:07:23 pm	1.940	26901			1.00	N/A
Replicates	25561.0	26205.3	27281.3	28555.0				
3053278004	UNK	09/20/19 04:08:34 pm	0.026	496			1.00	N/A
Replicates	473.8	538.8	444.0	527.2				
3053278005	UNK	09/20/19 04:09:46 pm	0.021	422			1.00	N/A
Replicates	439.7	406.7	411.7	428.7				

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-029

Instrument ID Number: Cetac Hg Method: CV Run Number: 092019W

Start Date: 9/20/2019 End Date: 9/20/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
Calibration Blank	1.00	1555																X								
Standard #1 (0.2 ug	1.00	1556																X								
Standard #2 (1 ug/L	1.00	1557																X								
Standard #3 (2 ug/L	1.00	1558																X								
Standard #4 (4 ug/L	1.00	1600																X								
Standard #5 (10 ug/	1.00	1601																X								
ICV	1.00	1602																X								
ICB	1.00	1603																X								
ZZZZZZ	1.00	1604																								
MB for HBN 543104 [	1.00	1606																X								
LCS for HBN 543104 [	1.00	1607																X								
ZZZZZZ	1.00	1608																								
ZZZZZZ	1.00	1609																								
ZZZZZZ	1.00	1610																								
ZZZZZZ	1.00	1612																								
ZZZZZZ	1.00	1613																								
ZZZZZZ	1.00	1614																								
03MW03S-20190916	1.00	1615																X								
CCV	1.00	1617																X								
CCB	1.00	1618																X								
03MW06SI-20190917	1.00	1619																X								
03MW06SI-20190917S	1.00	1620																X								
03MW06SI-20190917SD	1.00	1621																X								
03MW06S-20190917	1.00	1623																X								
03MW02S-20190917	1.00	1624																X								
03MW02I-20190917	1.00	1625																X								
03MW02SI-20190917	1.00	1627																X								
ZZZZZZ	1.00	1629																								
ZZZZZZ	1.00	1631																								
CCV	1.00	1632																X								
CCB	1.00	1634																X								
ZZZZZZ	1.00	1635																								
ZZZZZZ	1.00	1636																								
ZZZZZZ	1.00	1637																								
ZZZZZZ	1.00	1639																								
ZZZZZZ	1.00	1640																								

7470 DOD
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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-029

Instrument ID Number: Cetac Hg Method: CV Run Number: 092019W

Start Date: 9/20/2019 End Date: 9/20/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	1641																								
ZZZZZZ	1.00	1642																								
ZZZZZZ	1.00	1643																								
ZZZZZZ	1.00	1645																								
ZZZZZZ	1.00	1646																								
ZZZZZZ	1.00	1647																								
ZZZZZZ	1.00	1648																								
ZZZZZZ	1.00	1649																								
ZZZZZZ	1.00	1651																								
ZZZZZZ	1.00	1652																								
ZZZZZZ	1.00	1653																								
ZZZZZZ	1.00	1654																								
ZZZZZZ	1.00	1656																								
ZZZZZZ	1.00	1657																								
ZZZZZZ	1.00	1658																								
ZZZZZZ	1.00	1659																								
ZZZZZZ	1.00	1700																								
ZZZZZZ	1.00	1702																								
ZZZZZZ	1.00	1703																								
ZZZZZZ	1.00	1704																								
ZZZZZZ	1.00	1705																								
ZZZZZZ	1.00	1706																								
ZZZZZZ	1.00	1708																								
ZZZZZZ	1.00	1709																								
ZZZZZZ	1.00	1710																								
ZZZZZZ	1.00	1711																								
ZZZZZZ	1.00	1712																								
ZZZZZZ	1.00	1714																								
ZZZZZZ	1.00	1715																								
ZZZZZZ	1.00	1716																								
ZZZZZZ	1.00	1717																								
ZZZZZZ	1.00	1719																								
ZZZZZZ	1.00	1720																								
ZZZZZZ	1.00	1721																								
ZZZZZZ	1.00	1722																								
ZZZZZZ	1.00	1723																								

7470 DOD
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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR029|Willow Grove Sites 3 an

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-029

Instrument ID Number: Cetac Hg Method: CV Run Number: 092019W

Start Date: 9/20/2019 End Date: 9/20/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	1725																								
ZZZZZZ	1.00	1726																								
ZZZZZZ	1.00	1727																								
ZZZZZZ	1.00	1728																								
ZZZZZZ	1.00	1731																								
ZZZZZZ	1.00	1732																								

7470 DOD

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: CAS MIXED

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
ICV	Mercury	0.0039	0.004	98		90 - 110	CV	9/20/2019	16:02	092019W
CCV	Mercury	0.0037	0.004	92		90 - 110	CV	9/20/2019	16:17	092019W
CCV	Mercury	0.0037	0.004	92		90 - 110	CV	9/20/2019	16:32	092019W

7470 DOD

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB	Mercury	0.00050	U	0.00035	0.00016	0.00050	CV	9/20/2019	16:03	092019W
CCB	Mercury	0.00050	U	0.00035	0.00016	0.00050	CV	9/20/2019	16:18	092019W
CCB	Mercury	0.00050	U	0.00035	0.00016	0.00050	CV	9/20/2019	16:34	092019W

7470 DOD
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SAMPLE PREPARATION SUMMARY

Client: Earth Toxics Inc.

SDG No.: EPR-029

Contract: EPR029|Willow Grove Sites **Lab Code:** ALS
3 an

Method: CV

Case No.: WE04 **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	543104						
3015011	MB for HBN 543104 [MDIG/7998	MB	QC-WAT	9/20/19	5.0	5.0	
3015012	LCS for HBN 543104 [MDIG/7998	LCS	QC-WAT	9/20/19	5.0	5.0	
3058771002	03MW03S-20190916	SAM	WATER	9/20/19	5.0	5.0	
3058771003	03MW06SI-20190917	SAM	WATER	9/20/19	5.0	5.0	
3058771003S	03MW06SI-20190917S	MS	WATER	9/20/19	5.0	5.0	
3058771003SD	03MW06SI-20190917SD	MSD	WATER	9/20/19	5.0	5.0	
3058771004	03MW06S-20190917	SAM	WATER	9/20/19	5.0	5.0	
3058771005	03MW02S-20190917	SAM	WATER	9/20/19	5.0	5.0	
3058771006	03MW02I-20190917	SAM	WATER	9/20/19	5.0	5.0	
3058771007	03MW02SI-20190917	SAM	WATER	9/20/19	5.0	5.0	

7470 DOD
- 3b -
PREPARATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result (mg/L)	Conc Qual	Q	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
3015011			**QC-WATER**								
	Mercury	0.000500	U		0.0003	0.000160	0.000500	CV	9/20/2019	16:06	092019W

7470 DOD

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Aqueous LCS Source: CAS MIXED **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Q	QC Criteria	M
3015012									
	Mercury	mg/L	0.0020	0.0019		95		82 - 119	CV

7470 DOD
- 5a -
MATRIX SPIKE SUMMARY

Client: Earth Toxics Inc. **Level:** Low **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Matrix: WATER **Sample ID:** 3058771003 **Client ID:** 03MW06SI-20190917S **LIMS ID:** 3015014

Percent Solids for Sample: 0.00 **Spiked ID:** 3058771003S **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	Spiked Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	mg/L	82 - 119	0.0046		0.0005	U	0.0050	92.00		CV

7470 DOD

- 5a -

MATRIX SPIKE DUPLICATE SUMMARY

Client: Earth Toxics Inc. **Level:** Low **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Matrix: WATER **Sample ID:** 3058771003 **Client ID:** 03MW06SI-20190917SD **LIMS ID:** 3015015

Percent Solids for Sample: 0.00 **Spiked ID:** 3058771003SD **Percent Solids for Spike Sample:** 0.00

Analyte	Units	Acceptance Limit %R	MSD Result	C	Sample Result	C	Spike Added	% Recovery	Qual	M
Mercury	mg/L	82 - 119	0.0041		0.0005	U	0.0050	82.00		CV

7470 DOD
- 6 -
DUPLICATE SAMPLE SUMMARY

Client: Earth Toxics Inc. **Level:** Low **SDG No.:** EPR-029

Contract: EPR029|Willow Grove Sites 3 an **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Matrix: WATER **Sample ID:** 3058771003S **Client ID:** 03MW06SI-20190917SD **LIMS ID:** 3015015

Percent Solids for Sample: 0.00 **Duplicate ID:** 3058771003SD **Percent Solids for Duplicate:** 0.00

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M
Mercury	mg/L	0 - 20	0.0046		0.0041		11.5		CV

Mercury 7470 Prep (Water) rev 11/12/2015

Batch: 79983	Queue: MDIG	HBN: 543104	RULE: D7470PREP	ALS SOP:
File Name: 79983_190920-123833				WaterBath ID:

Comments:	Thermometer:			Start
1)	ID:	TH-048	Date:	09/20/2019
2)	Starting ºC:	95ºC	Time:	11:50:00
3)	Ending ºC:	95ºC	Tech:	AHI
4)			Reviewed/Approved By:	
5)			Date:	

Reagents and Working Standards	Reagent ID	Pipette ID
Intermediate STD: 0.1 mL 1000 ppm to 100mL	MR18785	03-034
Intermediate QC: 0.1 mL 1000 ppm to 100mL	MR18786	03-034
5% KMnO4:	MR18186	
5% K2S2O8:	MR18765	
H2SO4:	190221011	
HNO3:	190321004	
Working STD: 2.5mL Intermediate STD+300uL HNO3 to 100mL	MR18821	GEN-006
Working QC: 2.5mL Intermediate QC+300uL HNO3 to 100mL	MR18822	GEN-006

Calibration and Check Standards	Num
S0(ICB, CCB):# of S0's made:	3
S0.2: 0.200 mL Working Std into 25 mL:	MR18823
S1.0: 1.0 mL Working Std into 25 mL:	MR18824
S2.0: 2.0 mL Working Std into 25 mL:	MR18825
S4.0: 4.0 mL Working Std into 25 mL:	MR18826
S10: 10.0 mL Working Std into 25 mL:	MR18827
CCV: 4.0 mL Working QC into 25 mL:	MR18828
ICV: 4.0 mL Working Std into 25 mL:	MR18829
# of CCV's made:	3

Sample ID	Cont ID	Samp Type	Parent Sample ID	Sample Size, mL	Additional KMnO4, mL	Final Vol mL	Spike Amt mL	Spike Std #	Pipette ID#	Com
3015011		MB		5		5				
3015012		LCS		5		5	0.4	MR18822	GEN-004	
3053278004	A	S		5		5	0.4	MR18822	GEN-004	
3053278005	A	S		5		5				
3053278006	A	S		5		5				
3058474001	A	S		5		5				
3058474002	A	S		5		5				
3058474003	A	S		5		5				
3058771002	C	S		5		5				
3058771003	G	S		5		5				
3015014		MS	3058771003	5		5	0.025	MR18785	03-034	
3015015		MSD	3058771003	5		5	0.025	MR18785	03-034	
3058771004	C	S		5		5				
3058771005	C	S		5		5				
3058771006	C	S		5		5				

VOC CALCULATION	SAMPLE			
	03MW03S-20190916			
TARGET ANALYTE	tetrachloroethene			
ANALYTE RESPONSE	33774			
INTERNAL STANDARD	chlorobenzene-d5			
I.S. RESPONSE	776044			
I.S. CONCENTRATION	30	µg/l		
ANALYTE CAL. RF	0.41713			
DILUTION FACTOR (DF)	1			
INITIAL SAMPLE VOLUME - V1	5	ml		
FINAL SAMPLE VOLUME - V2	5	ml		
ON COLUMN AMOUNT	3.130011858	µg/l		
(ANALYTE RESPONSE) x (I.S. CONCENTRATION) X DF x V2	=	**3.13**	**µg/l**	
(I.S. RESPONSE) x (CAL. R.F.) x V1	=	**0.00313001**	**mg/l**	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW03S-20190916

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-029

Matrix (soil/water): WATER Lab Sample ID: 3058771002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092320.D

Level (low/med): Date Received: 9/18/19

% Moisture: not dec. 100.0 Date Analyzed: 9/23/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	3.1	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

ALS Environmental Services

VOLATILE REPORT SW-846 Method 8260

Data file : \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190923.b\719092320.
Lab Smp Id: 3058771002 Client Smp ID: 03MW03S-20190916
Inj Date : 23-SEP-2019 16:59
Operator : TMP Inst ID: ms07.i
Smp Info : 3058771002;;1;;;;;
Misc Info : ZZ VOMS 52399 D8260W
Comment :
Method : \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190923.b\7-8260b09.
Meth Date : 24-Sep-2019 11:17 tmp Quant Type: ISTD
Cal Date : 23-SEP-2019 12:27 Cal File: 719092308.D
Als bottle: 20
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: DODall.sub
Target Version: 4.14
Processing Host: ALMDTW7047

Concentration Formula: Amt * DF * Uf * 5/Vo * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged
DF	1.000	sample dilution factor
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/L)	REVIEW CODE
1 Dichlorodifluoromethane	85	Compound Not Detected.						
2 Chloromethane	50	Compound Not Detected.						
3 Vinyl Chloride	62	Compound Not Detected.						
4 Bromomethane	94	Compound Not Detected.						
5 Chloroethane	64	Compound Not Detected.						
6 Pentane	41	Compound Not Detected.						
7 Trichlorofluoromethane	101	Compound Not Detected.						
8 Dichlorofluoromethane	67	Compound Not Detected.						
9 Ethyl Ether	74	Compound Not Detected.						
10 1,1-Dichloroethene	61	Compound Not Detected.						
12 Carbon Disulfide	76	Compound Not Detected.						
11 Freon 113	101	Compound Not Detected.						
13 Iodomethane	127	Compound Not Detected.						
14 Acrolein	56	Compound Not Detected.						
16 3-Chloro-1-propene	41	Compound Not Detected.						
15 Isopropyl Alcohol	45	2.561	2.561	(0.631)	5434	32.6676	32.6676	
17 Methylene Chloride	84	Compound Not Detected.						
18 Acetone	58	Compound Not Detected.						
19 Methyl acetate	74	Compound Not Detected.						
20 trans-1,2-Dichloroethene	61	Compound Not Detected.						
21 Hexane	57	Compound Not Detected.						

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/L)	REVIEW CODE
	74 Tetrachloroethene	164	5.294	5.294	(0.875)	33774	3.13002	3.13002	
	76 Ethyl methacrylate	69	Compound Not Detected.						
	77 1,1,2-Trichloroethane	83	Compound Not Detected.						
	78 Chlorodibromomethane	129	Compound Not Detected.						
	79 1,3-Dichloropropane	76	Compound Not Detected.						
	80 1,2-Dibromoethane	107	Compound Not Detected.						
	81 2-Hexanone	43	Compound Not Detected.						
	82 1-Chlorohexane	91	Compound Not Detected.						
*	83 Chlorobenzene-d5	82	6.053	6.056	(1.000)	776044	30.0000		
	85 Ethylbenzene	106	Compound Not Detected.						
	84 Chlorobenzene	112	Compound Not Detected.						
	86 1,1,1,2-Tetrachloroethane	131	Compound Not Detected.						
	87 mp-Xylene	106	Compound Not Detected.						
M	120 1,3-Dichloropropene, Total	75	Compound Not Detected.						
	88 o-Xylene	106	Compound Not Detected.						
	89 Styrene	104	Compound Not Detected.						
	90 Bromoform	173	Compound Not Detected.						
	91 Isopropylbenzene	105	Compound Not Detected.						
$	92 4-Bromofluorobenzene	174	6.944	6.945	(0.888)	341143	33.8349	33.8349	
M	121 TOTAL XYLENES	106	Compound Not Detected.						
	94 n-Propylbenzene	120	Compound Not Detected.						
	93 Bromobenzene	156	Compound Not Detected.						
	95 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.						
	97 1,3,5-Trimethylbenzene	105	Compound Not Detected.						
	96 o-Chlorotoluene	91	Compound Not Detected.						
	98 1,2,3-Trichloropropane	110	Compound Not Detected.						
	99 trans-1,4-Dichloro-2-butene	53	Compound Not Detected.						
	101 p-Chlorotoluene	91	Compound Not Detected.						
	102 tert-Butylbenzene	134	Compound Not Detected.						
	103 Pentachloroethane	117	Compound Not Detected.						
	104 1,2,4-Trimethylbenzene	105	Compound Not Detected.						
	105 sec-Butylbenzene	105	Compound Not Detected.						
	106 p-Isopropyltoluene	134	Compound Not Detected.						
	107 1,3-Dichlorobenzene	146	Compound Not Detected.						
*	108 1,4-Dichlorobenzene-d4	152	7.825	7.825	(1.000)	537104	30.0000		(Q)
	109 1,4-Dichlorobenzene	146	Compound Not Detected.						
	111 n-Butylbenzene	134	Compound Not Detected.						
	110 Benzyl Chloride	126	Compound Not Detected.						
	112 Hexachloroethane	117	Compound Not Detected.						
	113 1,2-Dichlorobenzene	146	Compound Not Detected.						
	114 1,2-Dibromo-3-chloropropane	75	Compound Not Detected.						
	115 Nitrobenzene	77	Compound Not Detected.						
	116 Hexachlorobutadiene	225	Compound Not Detected.						
	117 1,2,4-Trichlorobenzene	180	Compound Not Detected.						
	118 Naphthalene	128	Compound Not Detected.						
	119 1,2,3-Trichlorobenzene	180	Compound Not Detected.						

QC Flag Legend

Q - Qualifier signal failed the ratio test.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-029

Instrument ID: ms07.i Calibration Date(s): 9/23/2019 9/23/2019

Heated Purge: (Y/N) N Calibration Time(s): 10:33 12:50

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092304.D RRF005 = 719092305.D RRF020 = 719092306.D RRF050 = 719092307.D

RRF100 = 719092308.D RRF200 = 719092309.D RRF00.5 = 719092303.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Iodomethane	1305951	460		Q	0.000000	0.059720	0.004500	0.99659
Isobutyl alcohol	260319	660		Q	0.000000	0.001840	-7.912000	0.99843
Isopropyl Alcohol	313660	1130		Q	0.000000	0.002550	0.000050	0.99714
Isopropylbenzene	2.40445	2.40381		A		2.457560		11.78986
p-Isopropyltoluene	2761010	3654		L	0.000000	1.798030		0.99933
Methyl acetate	0.03872	0.03695		A		0.035480		8.63669
Methyl acrylate	0.21538	0.18160		A		0.193790		11.88579
Methacrylonitrile	0.09764	0.08723		A		0.091160		9.01853
Methyl cyclohexane	5622247	10502		L	0.000000	1.066090		0.99874
Methyl methacrylate	2919068	4513		L	0.000000	5.005230		0.99907
Methyl t-Butyl Ether	0.54607	0.46815		A		0.503970		8.97743
4-Methyl-2-Pentanone(MIBK)	0.46111	0.45770		A		0.478510		11.30972
Methylene Chloride	0.19225	0.24092		A		0.199890		9.22123
Naphthalene	5847578	644		Q	0.000000	0.969910	0.031580	0.99563
Nitrobenzene	0.01732			A		0.008130		86.11077
2-Nitropropane	4084753	6011		L	0.000000	7.363400		0.99866
Octane	1466912	2439		Q	0.000000	0.236770	0.001600	0.99322
Pentachloroethane	0.39658	0.39265		A		0.385270		8.48913
Pentane	0.18950	0.26280		A		0.205830		13.32499
n-Propanol	0.01130	0.01321		A		0.011820		5.38348
Propionitrile	0.02765	0.02612		A		0.025980		7.05988
n-Propylbenzene	0.68766	0.64144		A		0.663860		13.39859
Styrene	1.61137	1.46043		A		1.564770		11.67090
1,1,1,2-Tetrachloroethane	0.46073	0.35795		A		0.406760		11.52245
1,1,2,2-Tetrachloroethane *	0.69841	0.80524		A		0.732400		5.44005
Tetrachloroethene	0.44809	0.42605		A		0.417130		7.07298
Tetrahydrofuran	0.06358	0.05500		A		0.058640		9.16503
Toluene **	1.23846	1.15502		A		1.179680		8.02863
Total Xylenes	0.82711	0.73041		A		0.781050		11.06472
1,2,3-Trichlorobenzene	1970603	172		Q	0.000000	0.357850	0.005880	0.99758
1,2,4-Trichlorobenzene	2491164	475		Q	0.000000	0.460740	0.006120	0.99824
1,1,1-Trichloroethane	0.29798	0.26267		A		0.268420		10.66405
1,1,2-Trichloroethane	0.38446	0.36244		A		0.366390		4.81579
Trichloroethene	0.22315	0.28251		A		0.224180		13.03105
Trichlorofluoromethane	0.29743	0.32305		A		0.323540		4.38877
1,2,3-Trichloropropane	0.20254	0.21191		A		0.206150		2.34477

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **T. MOORE** **DATE:** **DECEMBER 6, 2019**

FROM: **J. KALINYAK** **COPIES:** **DV FILE**

SUBJECT: **DATA VALIDATION – VOC, METALS**
WILLOW GROVE NAS JRB
SAMPLE DELIVERY GROUP (SDG) EPR-030

SAMPLES: **7 / Aqueous – VOC**

03DUP01-20190918	03MW04S-20190918	03MW04SI-20190918
03MW07S-20190918	03MW09IS-20190918	03RB01-20190918
03TB02-20190918		

6 / Aqueous – Metals

03DUP01-20190918	03MW04S-20190918	03MW04SI-20190918
03MW07S-20190918	03MW09IS-20190918	03RB01-20190918

Overview

The sample set for Willow Grove NAS JRB, SDG EPR-030, consisted of five (5) aqueous samples, one (1) rinse blank (RB) sample, and one (1) aqueous Trip Blank (TB) sample. All aqueous samples were analyzed for Volatile Organic Compounds (VOCs). Five (5) aqueous samples and the rinse blank sample were also analyzed for total metals including mercury, as listed above. One field duplicate sample pair was associated with this SDG: samples 03DUP01-20190918 / 03MW04SI-20190918.

The samples were collected by Tetra Tech on September 18, 2019 and analyzed by ALS Environmental for all analyses listed above. All analyses were conducted in accordance with EPA SW-846 Methods 8260B for VOCs, 6020A (ICP/MS) for total metals, and 7470A for mercury, analytical and reporting protocols.

The data contained in this SDG was validated at a EPA Stage Level 2B with regard to the following parameters: data completeness, holding times, initial & continuing calibration results, blank results, laboratory control sample (LCS)/LCS duplicate (LCSD) results, surrogate spike recoveries, internal standard recoveries, chromatographic resolution, ICP interference results, ICP serial dilution results, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major Problems

No major problems were identified.

Minor Problems

- Detected results reported below the quantitation limit but above the method detection limit (MDL) were qualified as estimated, (J).

- The initial calibration verification (ICV) percent differences (%Ds) were greater than the 20% Quality Control (QC) limit for acetone, bromomethane, and 1,4-dioxane for instrument ms07 on 09/26/2019 @ 00:06 affecting samples 03DUP01-20190918 and 03TB02-20190918. The LCS was used by the laboratory as the ICV. The sample 03DUP01-20190918 and 03TB02-20190918 acetone, bromomethane, and 1,4-dioxane detected and non-detected results were qualified estimated, (J) and (UJ), respectively.

- For the VOC fraction, the LCS had percent recoveries (%Rs) for acetone and 1,4-dioxane that were greater than the QC limits affecting associated batch samples 03DUP01-20190918 and 03TB02-20190918. The sample 03DUP01-20190918 detected result for acetone was qualified estimated, (J). The sample non-detected acetone and 1,4-dioxane results were not qualified.

- For the VOC fraction, the LCS had a %R for bromomethane that was less than the QC limits affecting associated batch samples 03DUP01-20190918 and 03TB02-20190918. The afore-mentioned samples had non-detected results for bromomethane that were qualified estimated, (UJ).

- The ICV %Ds were greater than the 20% QC limit for bromomethane, 2-butanone, 1,1-dichloroethene, trans-1,2-dichloroethene, 1,4-dioxane, and methyl acetate for instrument ms07 on 09/27/2019 @ 03:10 affecting samples 03MW04S-20190918, 03MW04SI-20190918, 03MW07S-20190918, 03MW09IS-20190918, and 03RB01-20190918. The LCS was used by the laboratory as the ICV. The aforementioned sample bromomethane, 2-butanone, 1,1-dichloroethene, trans-1,2-dichloroethene, 1,4-dioxane, and methyl acetate detected and non-detected results were qualified estimated, (J) and (UJ), respectively.

- For the VOC fraction, the LCS had %Rs for 2-butanone, 1,1-dichloroethene, trans-1,2-dichloroethene, 1,4-dioxane, and methyl acetate that were greater than the QC limits affecting associated batch samples 03MW04S-20190918, 03MW04SI-20190918, 03MW07S-20190918, 03MW09IS-20190918, and 03RB01-20190918. The sample 03MW07S-20190918 1,1-dichloroethene detected result was qualified estimated, (J). The remainder of the aforementioned sample 2-butanone, 1,1-dichloroethene, trans-1,2-dichloroethene, 1,4-dioxane, and methyl acetate results were non-detected and were not qualified.

- For the VOC fraction, the LCS had a %R for bromomethane that was less than the QC limits affecting associated batch samples 03MW04S-20190918, 03MW04SI-20190918, 03MW07S-20190918, 03MW09IS-20190918, and 03RB01-20190918. The samples had non-detected results for bromomethane that were qualified estimated, (UJ).

- For the VOC fraction, the surrogate %Rs for 4-bromofluorobenzene (BFB) were greater than the QC limits for samples 03DUP01-20190918, 03TB02-20190918, and 03MW07S-20190918. The aforementioned sample detected VOC results were qualified estimated high, (J+), except when also qualified for another QC issue in which case they were qualified estimated, (J). The sample non-detected VOC results were not qualified.

- For the metals fraction, copper and zinc were detected in the method blank for batch 544196 affecting all metal analysis samples at the following maximum concentrations listed below.

Analyte	Maximum Concentration	Limit of Quantitation (LOQ) > or <
Copper (1)	0.00282 mg/l	<LOQ
Zinc (1)	0.00308 mg/l	<LOQ

(1) Maximum concentration detected in method blank for batch 544196 affecting all metal analysis samples.

The samples 03MW04S-20190918, 03MW07S-20190918, and 03RB01-20190918 had detected copper results reported <LOQ. The sample 03MW04S-20190918 and 03MW07S-20190918 copper results were qualified as non-detected, (U). Sample 03RB01-20190918 is a rinse blank sample and therefore the copper result was not qualified. The samples 03MW04S-20190918, 03MW07S-20190918, and 03MW09IS-20190918 had detected zinc results reported <LOQ and were qualified as non-detected, (U). Copper and zinc results for the remaining affected samples were reported above the LOQ and were not qualified.

Notes

Non-detected sample analyte results were reported to the Limit of Detection (LOD).

The common laboratory contaminant acetone was detected in the rinse blank sample 03RB01-20190918 at 3.2 µg/l, <LOQ. No action was taken for this and this is noted for completeness.

For the metals analysis, thallium was detected in continuing calibration blanks (CCBs) on 09/26/2019 @ 04:39 and 05:19 above the instrument method detection limit (MDL) but below the instrument limit of quantitation (LOQ), <LOQ, affecting all metal analysis samples. No action was taken for this issue as all affected samples had non-detected thallium results.

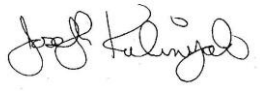
For the metals analysis, a CCV and an interference check had internal standard %Rs above the QC limit. No action was taken for this issue and it is noted for completeness only.

EXECUTIVE SUMMARY

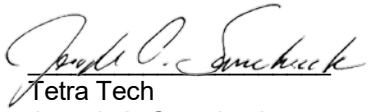
Laboratory Performance Issues: VOC sample results were qualified for ICV %D, and LCS & surrogate %R results outside the QC limits. Sample copper and zinc results were qualified non-detected for method blank contamination.

Other Factors Affecting Data Quality: Detected results reported below the quantitation limit but above the MDL were qualified as estimated, (J).

The data for these analyses were reviewed with reference to the USEPA National Functional Guidelines for Superfund Organic Methods Data Review (January 2017) and USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (January 2017).



Tetra Tech
Joseph Kalinyak
Data Validator/Environmental Scientist



Tetra Tech
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	03DUP01-20190918			03MW04S-20190918			03MW04SI-20190918			03MW07S-20190918		
SDG: EPR-030	LAB_ID	3059231002			3059231004			3059231003			3059231005		
FRACTION: OV	SAMP_DATE	9/18/2019			9/18/2019			9/18/2019			9/18/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	03MW04SI-20190918											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.42	J	PR
1,1,2,2-TETRACHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.53	J	PR
1,1-DICHLOROETHENE		0.75	U		0.75	UJ	C	0.75	UJ	C	0.72	J	CEPR
1,2,3-TRICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2,4-TRICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2-DIBROMOETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROPROPANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,3-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,4-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,4-DIOXANE		62.5	UJ	C	62.5	UJ	C	62.5	UJ	C	62.5	UJ	C
2-BUTANONE		3.8	U		3.8	UJ	C	3.8	UJ	C	3.8	UJ	C
2-HEXANONE		3.8	U		3.8	U		3.8	U		3.8	U	
4-METHYL-2-PENTANONE		3.8	U		3.8	U		3.8	U		3.8	U	
ACETONE		5.3	J	CER	3.5	J	P	5.6			3.8	U	
BENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOCHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMODICHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOFORM		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOMETHANE		0.75	UJ	CE	0.75	UJ	CE	0.75	UJ	CE	0.75	UJ	CE
CARBON DISULFIDE		0.75	U		0.75	U		0.75	U		0.75	U	
CARBON TETRACHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLORODIBROMOMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROFORM		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CIS-1,2-DICHLOROETHENE		0.75	U		0.75	U		0.75	U		0.75	U	
CIS-1,3-DICHLOROPROPENE		0.75	U		0.75	U		0.75	U		0.75	U	
CYCLOHEXANE		0.75	U		0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03MW09IS-20190918			03RB01-20190918			03TB02-20190918		
SDG: EPR-030	LAB_ID	3059231006			3059231007			3059231001		
FRACTION: OV	SAMP_DATE	9/18/2019			9/18/2019			9/18/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									

PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1,2,2-TETRACHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHENE	0.75	UJ	C	0.75	UJ	C	0.75	U	
1,2,3-TRICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,2,4-TRICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,2-DIBROMO-3-CHLOROPROPANE	2.5	U		2.5	U		2.5	U	
1,2-DIBROMOETHANE	0.75	U		0.75	U		0.75	U	
1,2-DICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,2-DICHLOROETHANE	0.75	U		0.75	U		0.75	U	
1,2-DICHLOROPROPANE	0.75	U		0.75	U		0.75	U	
1,3-DICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,4-DICHLOROBENZENE	0.75	U		0.75	U		0.75	U	
1,4-DIOXANE	62.5	UJ	C	62.5	UJ	C	62.5	UJ	C
2-BUTANONE	3.8	UJ	C	3.8	UJ	C	3.8	U	
2-HEXANONE	3.8	U		3.8	U		3.8	U	
4-METHYL-2-PENTANONE	3.8	U		3.8	U		3.8	U	
ACETONE	3.8	U		3.2	J	P	3.8	UJ	C
BENZENE	0.75	U		0.75	U		0.75	U	
BROMOCHLOROMETHANE	0.75	U		0.75	U		0.75	U	
BROMODICHLOROMETHANE	0.75	U		0.75	U		0.75	U	
BROMOFORM	0.75	U		0.75	U		0.75	U	
BROMOMETHANE	0.75	UJ	CE	0.75	UJ	CE	0.75	UJ	CE
CARBON DISULFIDE	0.75	U		0.75	U		0.75	U	
CARBON TETRACHLORIDE	0.75	U		0.75	U		0.75	U	
CHLOROBENZENE	0.75	U		0.75	U		0.75	U	
CHLORODIBROMOMETHANE	0.75	U		0.75	U		0.75	U	
CHLOROETHANE	0.75	U		0.75	U		0.75	U	
CHLOROFORM	0.75	U		0.75	U		0.75	U	
CHLOROMETHANE	0.75	U		0.75	U		0.75	U	
CIS-1,2-DICHLOROETHENE	0.75	U		0.75	U		0.75	U	
CIS-1,3-DICHLOROPROPENE	0.75	U		0.75	U		0.75	U	
CYCLOHEXANE	0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03DUP01-20190918			03MW04S-20190918			03MW04SI-20190918			03MW07S-20190918		
SDG: EPR-030	LAB_ID	3059231002			3059231004			3059231003			3059231005		
FRACTION: OV	SAMP_DATE	9/18/2019			9/18/2019			9/18/2019			9/18/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	03MW04SI-20190918											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLORODIFLUOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
ETHYLBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
ISOPROPYLBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
METHYL ACETATE		0.75	U		0.75	UJ	C	0.75	UJ	C	0.75	UJ	C
METHYL CYCLOHEXANE		0.75	U		0.75	U		0.75	U		0.75	U	
METHYL TERT-BUTYL ETHER		0.75	U		0.75	U		0.75	U		0.75	U	
METHYLENE CHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	
STYRENE		0.75	U		0.75	U		0.75	U		0.75	U	
TETRACHLOROETHENE		3.4	J+	R	2.8			3.7			0.65	J	PR
TOLUENE		0.75	U		0.75	U		0.75	U		0.75	U	
TOTAL XYLENES		2.3	U		2.3	U		2.3	U		2.3	U	
TRANS-1,2-DICHLOROETHENE		0.75	U		0.75	UJ	C	0.75	UJ	C	0.75	UJ	C
TRANS-1,3-DICHLOROPROPENE		0.75	U		0.75	U		0.75	U		0.75	U	
TRICHLOROETHENE		0.75	U		0.75	U		0.75	U		0.75	U	
TRICHLOROFLUOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
VINYL CHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03MW09IS-20190918			03RB01-20190918			03TB02-20190918		
SDG: EPR-030	LAB_ID	3059231006			3059231007			3059231001		
FRACTION: OV	SAMP_DATE	9/18/2019			9/18/2019			9/18/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									

PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLORODIFLUOROMETHANE	0.75	U		0.75	U		0.75	U	
ETHYLBENZENE	0.75	U		0.75	U		0.75	U	
ISOPROPYLBENZENE	0.75	U		0.75	U		0.75	U	
METHYL ACETATE	0.75	UJ	C	0.75	UJ	C	0.75	U	
METHYL CYCLOHEXANE	0.75	U		0.75	U		0.75	U	
METHYL TERT-BUTYL ETHER	0.75	U		0.75	U		0.75	U	
METHYLENE CHLORIDE	0.75	U		0.75	U		0.75	U	
STYRENE	0.75	U		0.75	U		0.75	U	
TETRACHLOROETHENE	3.8			0.75	U		0.75	U	
TOLUENE	0.75	U		0.75	U		0.75	U	
TOTAL XYLENES	2.3	U		2.3	U		2.3	U	
TRANS-1,2-DICHLOROETHENE	0.75	UJ	C	0.75	UJ	C	0.75	U	
TRANS-1,3-DICHLOROPROPENE	0.75	U		0.75	U		0.75	U	
TRICHLOROETHENE	0.75	U		0.75	U		0.75	U	
TRICHLOROFLUOROMETHANE	0.75	U		0.75	U		0.75	U	
VINYL CHLORIDE	0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03DUP01-20190918			03MW04S-20190918			03MW04SI-20190918			03MW07S-20190918		
SDG: EPR-030	LAB_ID	3059231002			3059231004			3059231003			3059231005		
FRACTION: M	SAMP_DATE	9/18/2019			9/18/2019			9/18/2019			9/18/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	03MW04SI-20190918											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALUMINUM		0.059	U		0.19			0.059	U		0.16		
ANTIMONY		0.0015	U		0.0015	U		0.0015	U		0.0015	U	
ARSENIC		0.002	U		0.002	U		0.002	U		0.002	U	
BARIUM		0.3			0.38			0.3			1.3		
BERYLLIUM		0.0007	U		0.0007	U		0.0007	U		0.0007	U	
CADMIUM		0.0007	U		0.0007	U		0.0007	U		0.0007	U	
CALCIUM		30.3			30.6			32.4			123		
CHROMIUM		0.0045			0.0029			0.0028			0.0024		
COBALT		0.0037	U		0.0037	U		0.0037	U		0.0037	U	
COPPER		0.012			0.0024	U	A	0.0037	U		0.0027	U	A
IRON		0.037	U		0.56			0.037	U		0.097		
LEAD		0.0015	U		0.0015	U		0.0015	U		0.0015	U	
MAGNESIUM		9.4			12			8.4			37		
MANGANESE		0.0037	U		0.17			0.0037	U		0.013		
MERCURY		0.00033	U		0.00033	U		0.00033	U		0.00033	U	
NICKEL		0.0023	J	P	0.0024	J	P	0.0037	U		0.0039	J	P
POTASSIUM		0.86			0.72			0.71			1.3		
SELENIUM		0.0037	U		0.0037	U		0.0022	J	P	0.0037	U	
SILVER		0.0015	U		0.0015	U		0.0015	U		0.0015	U	
SODIUM		17.5			13.9			15.8			46.3		
THALLIUM		0.0007	U		0.0007	U		0.0007	U		0.0007	U	
VANADIUM		0.0015	U		0.0014	J	P	0.0015	U		0.00095	J	P
ZINC		0.0073			0.0061			0.003	U	A	0.0031	U	A

PROJ_NO: 08005-WE04	NSAMPLE	03MW09IS-20190918			03RB01-20190918		
SDG: EPR-030	LAB_ID	3059231006			3059231007		
FRACTION: M	SAMP_DATE	9/18/2019			9/18/2019		
MEDIA: WATER	QC_TYPE	NM			NM		
	UNITS	MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALUMINUM		0.2			0.059	U	
ANTIMONY		0.0015	U		0.0015	U	
ARSENIC		0.002	U		0.002	U	
BARIUM		0.2			0.0037	U	
BERYLLIUM		0.0007	U		0.0007	U	
CADMIUM		0.0007	U		0.0007	U	
CALCIUM		24			0.047	J	P
CHROMIUM		0.0053			0.0015	U	
COBALT		0.0037	U		0.0037	U	
COPPER		0.026			0.0031	J	P
IRON		0.2			0.037	U	
LEAD		0.0015	U		0.0015	U	
MAGNESIUM		7.6			0.073	U	
MANGANESE		0.012			0.0037	U	
MERCURY		0.00033	U		0.00033	U	
NICKEL		0.0038	J	P	0.0037	U	
POTASSIUM		0.88			0.073	U	
SELENIUM		0.002	J	P	0.0037	U	
SILVER		0.0015	U		0.0015	U	
SODIUM		11.5			0.073	U	
THALLIUM		0.0007	U		0.0007	U	
VANADIUM		0.00093	J	P	0.0015	U	
ZINC		0.0045	U	A	0.006		

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03TB02-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092568.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03TB02-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092568.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03DUP01-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092575.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	5.3	
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03DUP01-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092575.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	3.4	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW04SI-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092619.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	5.6	
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW04SI-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092619.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	3.7	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW04S-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092620.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.5	J
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW04S-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092620.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	2.8	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW07S-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092621.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.53	J
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.72	J
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW07S-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092621.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.65	J
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.42	J
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW09IS-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231006

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092622.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW09IS-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231006

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092622.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	3.8	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03RB01-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231007

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092617.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.2	J
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03RB01-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231007

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092617.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 6020 3015 DOD

Sample ID: 3059231002 **Client ID:** 03DUP01-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	04:46:58
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:46:58
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:48:41
Barium	7440-39-3	0.30	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:48:41
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:46:58
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:46:58
Calcium	7440-70-2	30.3	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:46:58
Chromium	7440-47-3	0.0045	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:46:58
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:46:58
Copper	7440-50-8	0.012	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:48:41
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	01:48:41
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:46:58
Magnesium	7439-95-4	9.4	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:46:58
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:46:58
Nickel	7440-02-0	0.0023	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:46:58
Potassium	7440-09-7	0.86	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:46:58
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:48:41
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:46:58
Sodium	7440-23-5	17.5	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:46:58
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:46:58
Vanadium	7440-62-2	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:46:58
Zinc	7440-66-6	0.0073	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:48:41

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 6020 3015 DOD

Sample ID: 3059231003 **Client ID:** 03MW04SI-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	04:50:13
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:50:13
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:51:58
Barium	7440-39-3	0.30	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:51:58
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:50:13
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:50:13
Calcium	7440-70-2	32.4	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:50:13
Chromium	7440-47-3	0.0028	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:50:13
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:50:13
Copper	7440-50-8	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:51:58
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	01:51:58
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:50:13
Magnesium	7439-95-4	8.4	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:50:13
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:50:13
Nickel	7440-02-0	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:50:13
Potassium	7440-09-7	0.71	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:50:13
Selenium	7782-49-2	0.0022	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:51:58
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:50:13
Sodium	7440-23-5	15.8	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:50:13
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:50:13
Vanadium	7440-62-2	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:50:13
Zinc	7440-66-6	0.0030	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:51:58

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 6020 3015 DOD

Sample ID: 3059231004 **Client ID:** 03MW04S-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.19	mg/L			M	0.089	0.059	0.030	1.00	9/26/2019	04:53:29
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:53:29
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:55:14
Barium	7440-39-3	0.38	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:55:14
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:53:29
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:53:29
Calcium	7440-70-2	30.6	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:53:29
Chromium	7440-47-3	0.0029	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:53:29
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:53:29
Copper	7440-50-8	0.0024	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:55:14
Iron	7439-89-6	0.56	mg/L			M	0.056	0.037	0.019	1.00	9/27/2019	01:55:14
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:53:29
Magnesium	7439-95-4	12.0	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:53:29
Manganese	7439-96-5	0.17	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:53:29
Nickel	7440-02-0	0.0024	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:53:29
Potassium	7440-09-7	0.72	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:53:29
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:55:14
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:53:29
Sodium	7440-23-5	13.9	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:53:29
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:53:29
Vanadium	7440-62-2	0.0014	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:53:29
Zinc	7440-66-6	0.0061	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:55:14

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 6020 3015 DOD

Sample ID: 3059231005 **Client ID:** 03MW07S-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.16	mg/L			M	0.089	0.059	0.030	1.00	9/26/2019	04:56:45
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:56:45
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	01:58:31
Barium	7440-39-3	1.3	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:58:31
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:56:45
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	04:56:45
Calcium	7440-70-2	123	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:56:45
Chromium	7440-47-3	0.0024	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:56:45
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:56:45
Copper	7440-50-8	0.0027	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:58:31
Iron	7439-89-6	0.097	mg/L			M	0.056	0.037	0.019	1.00	9/27/2019	01:58:31
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:56:45
Magnesium	7439-95-4	37.0	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:56:45
Manganese	7439-96-5	0.013	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:56:45
Nickel	7440-02-0	0.0039	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	04:56:45
Potassium	7440-09-7	1.3	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:56:45
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:58:31
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:56:45
Sodium	7440-23-5	46.3	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	04:56:45
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	04:56:45
Vanadium	7440-62-2	0.00095	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	04:56:45
Zinc	7440-66-6	0.0031	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	01:58:31

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 6020 3015 DOD

Sample ID: 3059231006 **Client ID:** 03MW09IS-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.20	mg/L			M	0.089	0.059	0.030	1.00	9/26/2019	05:00:00
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:00:00
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	02:01:47
Barium	7440-39-3	0.20	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:00:00
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:00:00
Cadmium	7440-43-9	0.0007	mg/L	U		M	0.0011	0.0007	0.0004	1.00	9/26/2019	05:00:00
Calcium	7440-70-2	24.0	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:00:00
Chromium	7440-47-3	0.0053	mg/L			M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:00:00
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:00:00
Copper	7440-50-8	0.026	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:01:47
Iron	7439-89-6	0.20	mg/L			M	0.056	0.037	0.019	1.00	9/27/2019	02:01:47
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:00:00
Magnesium	7439-95-4	7.6	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:00:00
Manganese	7439-96-5	0.012	mg/L			M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:00:00
Nickel	7440-02-0	0.0038	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:00:00
Potassium	7440-09-7	0.88	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:00:00
Selenium	7782-49-2	0.0020	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:01:47
Silver	7440-22-4	0.0015	mg/L	U		M	0.0022	0.0015	0.0007	1.00	9/26/2019	05:00:00
Sodium	7440-23-5	11.5	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:00:00
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:00:00
Vanadium	7440-62-2	0.00093	mg/L	J		M	0.0022	0.0015	0.0007	1.00	9/26/2019	05:00:00
Zinc	7440-66-6	0.0045	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:01:47

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 6020 3015 DOD

Sample ID: 3059231007 **Client ID:** 03RB01-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	05:03:15
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:03:15
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	02:05:01
Barium	7440-39-3	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:03:15
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:03:15
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	05:03:15
Calcium	7440-70-2	0.047	mg/L	J		M	0.11	0.073	0.037	1.00	9/26/2019	05:03:15
Chromium	7440-47-3	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:03:15
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:03:15
Copper	7440-50-8	0.0031	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:05:01
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	02:05:01
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:03:15
Magnesium	7439-95-4	0.073	mg/L	U		M	0.11	0.073	0.037	1.00	9/26/2019	05:03:15
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:03:15
Nickel	7440-02-0	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:03:15
Potassium	7440-09-7	0.073	mg/L	U		M	0.11	0.073	0.037	1.00	9/26/2019	05:03:15
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:05:01
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:03:15
Sodium	7440-23-5	0.073	mg/L	U		M	0.11	0.073	0.037	1.00	9/26/2019	05:03:15
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:03:15
Vanadium	7440-62-2	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:03:15
Zinc	7440-66-6	0.0060	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:05:01

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 7470 DOD

Sample ID: 3059231002 **Client ID:** 03DUP01-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	14:52:49

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 7470 DOD

Sample ID: 3059231003 **Client ID:** 03MW04SI-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	14:54:01

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 7470 DOD

Sample ID: 3059231004 **Client ID:** 03MW04S-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	14:55:14

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 7470 DOD

Sample ID: 3059231005 **Client ID:** 03MW07S-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	14:56:26

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 7470 DOD

Sample ID: 3059231006 **Client ID:** 03MW09IS-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	14:57:39

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-030 **Method Type:** 7470 DOD

Sample ID: 3059231007 **Client ID:** 03RB01-20190918

Matrix: WATER **Date Received:** 9/19/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	14:58:51

Comments:

APPENDIX C

SUPPORT DOCUMENTATION

301 Fulling Mill Road
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC
ALS

30592311

of 1 1

Client Name: Tetra Tech	Container Type	VOA	Poly	Poly	Poly	Poly							
Address: 234 Mall Boulevard Suite 260 King of Prussia PA 19406	Container Size	40ml	125ml	1Liter	1Liter	1Liter							
	Preservative	HCl	HNO_3	HNO_3	HNO_3	HNO_3							

W.O. Temp: 0°C Therm ID: 402
Analyst Initials: JDS
Courier/Tracking #:
Purchase Order #:

Contact: Tricia Moore
Phone#: 610 392 1171
Project Name/#: Willow Grove Sites 3 and 12
Bill To: Tetra Tech Foster Plaza 7

TAT: ☑ Normal-Standard TAT is 10-12 business days. ☐ Rush-Subject to ALS approval and surcharges.
Date Required: Approved?
Email? ☐ -Y
Fax? ☐ -Y No.:

ANALYSES/METHOD REQUESTED

Project Comments:

ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment
Other:

	Sample Description/Location (as it will appear on the lab report)	Date Collected mm/dd/yy	Time hh:mm	*G or C	**Matrix	40ml VOA Vial VOC's	125ml Poly Metals + Hg	1 Liter Poly Uranium 238	1 Liter Poly Strontium-90	1 Liter Poly Radium 226						Sample/COC Comments
						Enter Number of Containers Per Sample or Field Results Below.										
1	03TB02-20190918	9/18/19	0900	G	AQ	2										
2	03DUP01-20190918	9/18/19	1200	G	GW	2	1	1	1	1						
3	03MW04SI-20190918	9/18/19	1230	G	GW	2	1	1	1	1						
4	03MW04S-20190918	9/18/19	1240	G	GW	2	1	1	1	1						
5	03MW07S-20190918	9/18/19	1500	G	GW	2	1	1	1	1						
6	03MW09I-20190918	9/18/19	1505	G	GW	2	1	1	1	1						
7	03RB01-20190918	9/18/19	1800	G	GW	2	1	1	1	1						
8																
9																
10																

SAMPLED BY (Please Print): Charles Meyer

Sampler Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Charles Meyer Tetra Tech	9/19/19	1427	2 Chris Fidencio	9/19/19	1427
3 Chris Fidencio	9/19/19	1700	4		
5			6	9/19/19	2133
7			8		
9			10		

Data Deliverables: ☑ Standard ☐ CLP-like ☐ USACE/DOD

Special Processing: USACE ☐

State Samples Collected In: ☐ NY ☐ NJ ☑ PA

Reportable to PADEP? Yes ☐ No ☑
PWSID #

Sample Disposal: Lab ☑ Special ☐

EDDS: Format Type-

other

* G=Grab; C=Composite

**Matrix - AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

ALS SHIPPING ADDRESS: 301 Fulling Mill Road, Middletown, PA 17057

Rev 04/19

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

Condition of Sample Receipt Form

Client: TETRA TECH | Work Order #: 3059231 | Initials: JDB | Date: 9/20/19

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

Cooler #: —

Temperature (°C): 0°C

Thermometer ID: 402

Radiological (µCi): —

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

GW - not reportable. JDB/MS 9/20/19

Rev. 4/29/2019

ALS Environmental
34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

Internal Chain of Custody

Work Order: 3059231

3059231001-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231001-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231001-C	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231002-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231002-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231002-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231002-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231002-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231002-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To

Internal Chain of Custody
Work Order: 3059231

3059231002-F (cont)	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231002-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231003-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231003-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231003-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231003-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231003-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231003-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231003-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To

Internal Chain of Custody

Work Order: 3059231

3059231003-G (cont)	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231004-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231004-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231004-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231004-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231004-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231004-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231004-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231005-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A

Internal Chain of Custody

Work Order: 3059231

3059231005-A (cont)	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231005-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231005-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231005-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231005-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
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3059231005-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
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09-19-19 21:33	*Sample Received At Lab*		

3059231005-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231006-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231006-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A

Internal Chain of Custody

Work Order: 3059231

3059231006-B (cont)	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231006-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231006-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
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Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
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Transfer Date	To Location	Transfer Reason	Transferred To
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09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
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3059231006-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231007-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231007-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:09	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231007-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A

Internal Chain of Custody

Work Order: 3059231

3059231007-C (cont)	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231007-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231007-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231007-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 07:07	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

3059231007-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 06:58	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-19-19 21:33	*Sample Received At Lab*		

Tetra Tech

ALS-Middletown
Case Narrative
EPR-030 (3059231)

Sample Management

This report contains the results of the analysis of seven (7) water samples collected on September 18, 2019. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is >40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on September 19, 2019. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Subcontracted Data

Six (6) water samples were submitted to ALS Fort Collins, Colorado for the analysis of isotopic uranium, radium-226, and strontium-90. The data has been included at the end of this data package.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Seven (7) ground water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within holding time.

Initial Calibrations Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note:** The batch LCS also serves as a second source (ICV).

Continuing Calibration Verification. Samples were run immediately after initial calibration.

Blanks. Target analytes were not detected in the method blanks.

Surrogates. Recoveries were within control limits, except as follows:

- In 3017123 MB, 3059231001, 3059231002 and 3059231005, BFB was recovered above control limits.

Laboratory control samples. Target analytes were within control limits, except as follows:

- In 3017124 LCS, Acetone, Bromomethane and 1,4-Dioxane were recovered outside control limits.
- In 3017576 LCS, Bromomethane, 2-Butanone, 1,1-Dichloroethene, trans-1,2-Dichloroethene, 1,4-Dioxane and Methyl acetate were recovered outside control limits.

Internal Standards. Internal standard results met method criteria.

Total Metals by SW-846 Method 6020A

Sample handling. Six (6) water samples were digested by SW-846 Method 3015 and analyzed for total metals on the Agilent 7700x ICP-MS, using SW-846 Method 6020A. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Spikes. A matrix spike and matrix spike duplicate was not performed on a sample in this data deliverable.

Dilution Test. A dilution test was not performed on a sample in this data deliverable.

Total Mercury in Water by EPA Method 7470A

Sample handling. Six (6) water samples were analyzed for total mercury using EPA method 7470A. The samples were digested and analyzed within the 28-day holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within control limits.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Sample. The laboratory control sample was recovered within the control limits.

Spikes. A matrix spike/matrix spike duplicate was not performed on samples in this deliverable group.

I _Jennifer M. Stanhope Lamoreux_, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated PDF data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at _717-944-5541_ if there are any questions or problems with the enclosed electronic deliverables.

Signature: Title:_Reporting Manager_ Date:_11/8/2019_

Volatile Organic Compounds by Method 8260 Summary Forms

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-030

Lab File ID: 719092550.D BFB Injection Date: 9/25/2019

Instrument ID: ms07.i BFB Injection Time: 19:30

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: Y/N N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.0
75	30.0 - 60.0% of mass 95	48.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.4(0.6) 1
174	50.0 - 100.0% of mass 95	80.0
175	5.0 - 9.0% of mass 174	5.9 (7.3) 1
176	95.0 - 101.0% of mass 174	78.5 (98.1) 1
177	5.0 - 9.0% of mass 176	4.9 (6.2) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
VSTD00.5	VSTD00.5	719092553.D	9/25/2019	20:42
1234	1234	719092554.D	9/25/2019	21:05
1235	1235	719092555.D	9/25/2019	21:27
1236	1236	719092556.D	9/25/2019	21:50
1237	1237	719092557.D	9/25/2019	22:12
1238	1238	719092558.D	9/25/2019	22:35
1239	1239	719092559.D	9/25/2019	22:58
3017124(LCS)	3017124	719092562.D	9/26/2019	00:06
3017123(MB)	3017123	719092566.D	9/26/2019	01:36
03TB02-20190918	3059231001	719092568.D	9/26/2019	02:21
03DUP01-20190918	3059231002	719092575.D	9/26/2019	04:59
1801	1801	719092576.D	9/26/2019	05:22

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Acetone	948980	2799		Q	0.000000	0.010740	0.000070	0.99462
Acrolein	0.03781	0.03988		A		0.036540		7.46760
Acrylonitrile	0.06718	0.07281		A		0.063760		9.23389
Acetonitrile	876235	2689		Q	0.000000	0.007490	0.000140	0.99052
tert-Amyl Ethylether	0.48680	0.40561		A		0.426490		11.69584
tert-Amyl methyl ether	0.56029	0.50076		A		0.508660		9.95701
tert-Amyl Alcohol	456008	873		Q	0.000000	0.003520	0.000080	0.99109
Benzene	0.82712	0.99980		A		0.870710		6.78730
Benzyl Chloride	843955	482		Q	0.000000	0.137320	0.004370	0.99970
Bromobenzene	0.56475	0.71172		A		0.613040		8.33190
Bromochloromethane	0.09635	0.11487		A		0.102920		6.64619
Bromodichloromethane	0.28242	0.25992		A		0.260940		8.15598
Bromoform *	0.37575	0.32573		A		0.335700		10.49233
Bromomethane	0.10617	0.11863		A		0.104700		8.28861
2-Butanone	0.02203	0.02684		A		0.022570		11.23267
tert.- Butyl Alcohol		1152		Q	0.000000	0.007300	-0.000190	0.99785
tert-Butylbenzene	0.45793	0.44241		A		0.460130		3.15276
n-Butylbenzene	0.47269	0.34682		A		0.430180		12.38009
sec-Butylbenzene	2.31406	2.31244		A		2.444270		5.28271
Carbon Disulfide	0.62949	0.86237		A		0.668270		13.05718
Carbon Tetrachloride	0.27691	0.28056		A		0.251080		9.12839
Chloroacetonitrile		780		Q	0.000000	0.012160	-0.000300	0.99682
Chlorobenzene *	1.21425	1.49358		A		1.302190		7.33158
1-Chlorobutane	0.23601	0.29213		A		0.235720		11.14631
Chlorodibromomethane	0.49599	0.39797		A		0.431120		12.63160
Chloroethane	2219745	13138		Q	0.000000	0.176420	-0.003080	0.99999
2-Chloroethylvinyl ether	1636827	1853		Q	0.000000	0.095400	0.002930	0.99976
Chloroform **	0.38686	0.47550		A		0.396050		8.99195
1-Chlorohexane	0.72874	0.67927		A		0.683460		7.45111
Chloromethane *	0.24683	0.34536		A		0.260080		14.55037
Chloroprene	0.33588	0.36404		A		0.318780		9.23389
3-Chloro-1-propene	0.28227	0.34211		A		0.290900		8.53556
o-Chlorotoluene	1.86949	2.02278		A		1.977110		3.26220
p-Chlorotoluene	1.72043	1.88084		A		1.804560		3.63136
Cyclohexane	0.34992	0.34726		A		0.338340		5.32706
1,2-Dibromo-3-Chloropropane	497970	520		Q	0.000000	0.077350	0.003090	0.99913

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2-Dibromoethane	0.43951	0.44051		A		0.413070		7.80489
Dibromomethane	0.13079	0.14679		A		0.128370		7.44545
trans-1,4-Dichloro-2-butene	847809	987		L	0.000000	6.041410		0.99936
1,2-Dichlorobenzene	0.94617	0.95910		A		0.950220		3.80318
1,3-Dichlorobenzene	1.05020	1.12790		A		1.076130		5.28740
1,4-Dichlorobenzene	1.02708	1.26952		A		1.108140		9.61832
Dichlorodifluoromethane	0.32338	0.40669		A		0.327620		11.09148
1,1-Dichloroethane *	0.37338	0.41541		A		0.369100		6.69796
1,2-Dichloroethene, Total	0.29080	0.32965		A		0.284870		7.48920
1,2-Dichloroethane	0.25747	0.30168		A		0.259450		7.84294
1,1-Dichloroethene **	0.26189	0.32864		A		0.263560		12.71009
cis-1,2-Dichloroethene	0.29860	0.32539		A		0.292800		5.91975
trans-1,2-Dichloroethene	0.28300	0.33392		A		0.276950		9.51743
Dichlorofluoromethane	0.36317	0.44879		A		0.371590		9.62849
1,1-Dichloro-2-Propanone	291819	395		Q	0.000000	0.007720	0.000050	0.99848
2,2-Dichloropropane	0.25071	0.27133		A		0.235250		8.99257
1,3-Dichloropropane	0.75768	0.80803		A		0.746270		5.36210
1,2-Dichloropropane **	0.23419	0.23751		A		0.224910		5.86267
1,1-Dichloropropene	0.31415	0.34944		A		0.305260		7.47762
cis-1,3-Dichloropropene	0.80057	0.67782		A		0.715360		11.26637
trans-1,3-Dichloropropene	0.72243	0.58081		A		0.637930		12.49726
1,3-Dichloropropene, Total	0.76150	0.62932		A		0.676650		11.82276
Diisobutylene	8434168	85487		L	0.000000	1.679030		0.99950
Diisopropyl ether	0.66714	0.63446		A		0.632240		7.31200
1,4-Dioxane	149560			Q	0.000000	0.000260	0.000001	0.99926
Ethyl Acetate	0.19852	0.19263		A		0.179340		11.76447
Ethyl ether	0.12179	0.14325		A		0.119550		10.66867
Ethyl Methacrylate	4161149	6351		L	0.000000	1.471870		0.99961
Ethyl tert-butyl ether	0.60989	0.55193		A		0.560560		9.10205
Ethylbenzene **	0.69752	0.81231		A		0.718680		7.20869
Freon 113	0.21161	0.22838		A		0.207070		8.39360
Heptane	0.15448	0.13867		A		0.139550		10.47982
Hexachlorobutadiene	0.20054	0.19642		A		0.187590		8.98053
Hexachloroethane	0.38858	0.31106		A		0.338100		10.99397
Hexane	0.44669	0.44168		A		0.423200		6.92083
2-Hexanone	4423925	6781		L	0.000000	6.922060		0.99963

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Iodomethane	1322383	249		Q	0.000000	0.064510	0.004370	0.99551
Isobutyl alcohol	182803	459		Q	0.000000	0.000730	0.000008	0.99217
Isopropyl Alcohol		361		Q	0.000000	0.002230	-0.000060	0.99819
Isopropylbenzene	2.35427	2.60241		A		2.576400		4.69555
p-Isopropyltoluene	0.54224	0.42228		A		0.514570		9.36138
Methyl acetate	0.03431	0.03733		A		0.032950		10.49648
Methyl acrylate	0.19736	0.17559		A		0.180580		8.94379
Methacrylonitrile	0.09056	0.09622		A		0.088550		6.78720
Methyl cyclohexane	0.91892	0.95331		A		0.895750		9.95149
Methyl methacrylate	0.18618	0.16826		A		0.165090		13.24116
Methyl t-Butyl Ether	0.54858	0.51947		A		0.517340		6.12188
4-Methyl-2-Pentanone(MIBK)	8869360	13603		Q	0.000000	0.248790	0.001250	0.99887
Methylene Chloride	2814861	9437		L	0.000000	5.048260		0.99986
Naphthalene	5487471	683		Q	0.000000	0.704010	0.056740	0.99857
Nitrobenzene	428299			Q	0.000000	-0.002080	0.000160	0.99610
2-Nitropropane	3447874	5405		Q	0.000000	0.097420	0.000470	0.99921
Octane	0.23140	0.21911		A		0.203940		14.77699
Pentachloroethane	0.36275	0.36448		A		0.366060		4.52175
Pentane	2708082	9008		Q	0.000000	0.208280	-0.002680	0.99986
n-Propanol	0.01113	0.01516		A		0.011840		12.50008
Propionitrile	1549366	4287		Q	0.000000	0.017610	0.000120	0.99447
n-Propylbenzene	0.67587	0.67469		A		0.692560		2.54349
Styrene	1.55889	1.59911		A		1.590120		4.30460
1,1,1,2-Tetrachloroethane	0.45161	0.45504		A		0.427700		6.27376
1,1,2,2-Tetrachloroethane *	0.63893	0.74063		A		0.672930		5.24785
Tetrachloroethene	0.46330	0.55251		A		0.474290		9.18633
Tetrahydrofuran	0.05338	0.05629		A		0.050920		9.59334
Toluene **	1.21456	1.31349		A		1.222220		3.85046
Total Xylenes	0.80875	0.82404		A		0.813960		3.62583
1,2,3-Trichlorobenzene	1978950	185		Q	0.000000	0.314430	0.011340	0.99902
1,2,4-Trichlorobenzene	2489280	95.00000		Q	0.000000	0.421820	0.010410	0.99922
1,1,1-Trichloroethane	0.31106	0.31881		A		0.290010		7.31166
1,1,2-Trichloroethane	0.36684	0.42046		A		0.367980		6.87792
Trichloroethene	0.22998	0.28809		A		0.236230		10.44862
Trichlorofluoromethane	4689266	15850		Q	0.000000	0.370020	-0.006080	0.99996
1,2,3-Trichloropropane	0.18557	0.21697		A		0.195070		6.18577

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2,4-Trimethylbenzene	1.89758	1.69320		A		1.919470		6.07993
1,3,5-Trimethylbenzene	1.86226	1.78525		A		1.932330		4.43656
Vinyl Acetate	0.04481	0.03720		A		0.038780		13.13814
Vinyl Chloride **	0.30652	0.42053		A		0.316810		14.60306
o-Xylene	0.82392	0.74438		A		0.781300		6.00514
mp-Xylene	0.80116	0.86388		A		0.830290		3.85630
4-Bromofluorobenzene	0.53981	0.67405		A		0.550840		10.05903
Dibromofluoromethane	0.18677	0.17922		A		0.177720		5.72689
1,2-Dichloroethane-d4	0.20645	0.21109		A		0.200220		3.45681
Toluene-d8	1.60907	1.59074		A		1.588710		5.34518

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.
SPCC Compounds (*) with required minimum RRF.
CCC Compounds (**) with required maximum %RSD.

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Laboratory Control Spike - Sample No: 3017124

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Acetone	100		142	142*	(80-120)
Benzene	20		20.5	102	(80-120)
Bromochloromethane	20		20.6	103	(80-120)
Bromodichloromethane	20		21.0	105	(80-120)
Bromoform	20		20.8	104	(80-120)
Bromomethane	20		15.8	79*	(80-120)
2-Butanone	100		115	115	(80-120)
Carbon Disulfide	20		17.8	89	(80-120)
Carbon Tetrachloride	20		21.8	109	(80-120)
Chlorobenzene	20		19.9	99.6	(80-120)
Chlorodibromomethane	20		21.2	106	(80-120)
Chloroethane	20		18.5	92.6	(80-120)
Chloroform	20		20.0	100	(80-120)
Chloromethane	20		18.8	93.9	(80-120)
Cyclohexane	20		21.4	107	(80-120)
1,2-Dibromo-3-Chloropro	20		20.3	101	(80-120)
1,2-Dibromoethane	20		20.7	104	(80-120)
1,2-Dichlorobenzene	20		20.2	101	(80-120)
1,3-Dichlorobenzene	20		19.6	97.9	(80-120)
1,4-Dichlorobenzene	20		19.2	95.8	(80-120)
Dichlorodifluoromethane	20		18.1	90.4	(80-120)
1,1-Dichloroethane	20		22.0	110	(80-120)
1,2-Dichloroethane	20		20.3	101	(80-120)
1,1-Dichloroethene	20		22.0	110	(80-120)
cis-1,2-Dichloroethene	20		20.5	102	(80-120)
trans-1,2-Dichloroethen	20		22.5	112	(80-120)
1,2-Dichloropropane	20		20.5	103	(80-120)
cis-1,3-Dichloropropene	20		22.0	110	(80-120)
trans-1,3-Dichloroprope	20		22.7	113	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 3 out of 51 outside limits

Comments:

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Laboratory Control Spike - Sample No: 3017124

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
1,4-Dioxane	500		949	190*	(80-120)
Ethylbenzene	20		20.1	100	(80-120)
Freon 113	20		18.2	91.2	(80-120)
2-Hexanone	100		99.7	99.7	(80-120)
Isopropylbenzene	20		21.0	105	(80-120)
Methyl acetate	20		21.8	109	(80-120)
Methyl cyclohexane	20		20.8	104	(80-120)
Methyl t-Butyl Ether	20		21.3	106	(80-120)
4-Methyl-2-Pentanone(MI	100		110	110	(80-120)
Methylene Chloride	20		21.8	109	(80-120)
Styrene	20		20.9	104	(80-120)
1,1,2,2-Tetrachloroetha	20		20.9	105	(80-120)
Tetrachloroethene	20		18.4	92.2	(80-120)
Toluene	20		20.6	103	(80-120)
Total Xylenes	60		62.6	104	(80-120)
1,2,3-Trichlorobenzene	20		17.5	87.7	(80-120)
1,2,4-Trichlorobenzene	20		17.6	87.9	(80-120)
1,1,1-Trichloroethane	20		22.1	111	(80-120)
1,1,2-Trichloroethane	20		20.2	101	(80-120)
Trichloroethene	20		20.1	100	(80-120)
Trichlorofluoromethane	20		19.5	97.5	(80-120)
Vinyl Chloride	20		18.8	93.8	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 3 out of 51 outside limits

Comments:

ALS Environmental Services

RECOVERY REPORT

Client Name: Client SDG: 7190925A.b
Sample Matrix: LIQUID Fraction: VOA
Lab Smp Id: 1801
Level: LOW Operator: PDK
Data Type: MS DATA SampleType: LCS
SpikeList File: DODENDCCV.spk Quant Type: ISTD
Sublist File: DODall.sub
Method File: \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190925A.b\7-8260b0
Misc Info:

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
1	Dichlorodifluorome	50.0000	50.9742	101.95	50-150
2	Chloromethane	50.0000	50.6285	101.26	50-150
3	Vinyl Chloride	50.0000	49.8842	99.77	50-150
4	Bromomethane	50.0000	42.8696	85.74	50-150
5	Chloroethane	50.0000	51.6205	103.24	50-150
6	Pentane	50.0000	53.8170	107.63	50-150
7	Trichlorofluoromet	50.0000	52.6040	105.21	50-150
8	Dichlorofluorometh	50.0000	51.1964	102.39	50-150
9	Ethyl Ether	50.0000	51.3345	102.67	50-150
10	1,1-Dichloroethene	50.0000	53.1270	106.25	50-150
11	Freon 113	50.0000	52.1674	104.33	50-150
12	Carbon Disulfide	50.0000	50.1192	100.24	50-150
13	Iodomethane	50.0000	40.3214	80.64	50-150
14	Acrolein	250.000	259.103	103.64	50-150
15	Isopropyl Alcohol	250.000	0.000000	0.00*	50-150
16	3-Chloro-1-propene	50.0000	52.3612	104.72	50-150
17	Methylene Chloride	50.0000	50.7413	101.48	50-150
18	Acetone	250.000	296.061	118.42	50-150
19	Methyl acetate	50.0000	51.0729	102.15	50-150
20	trans-1,2-Dichloro	50.0000	49.5919	99.18	50-150
21	Hexane	50.0000	54.1363	108.27	50-150
22	Methyl t-Butyl Eth	50.0000	51.8661	103.73	50-150
23	tert.- Butyl Alcoh	250.000	415.215	166.09*	50-150
24	Acetonitrile	250.000	375.467	150.19*	50-150
25	Diisopropyl ether	50.0000	53.9773	107.95	50-150
26	Chloroprene	50.0000	53.7516	107.50	50-150
27	1,1-Dichloroethane	50.0000	52.1682	104.34	50-150
28	Acrylonitrile	250.000	268.758	107.50	50-150
30	n-Propanol	500.000	496.152	99.23	50-150
29	Ethyl tert-butyl e	50.0000	53.4556	106.91	50-150
31	Vinyl acetate	50.0000	52.5286	105.06	50-150
32	cis-1,2-Dichloroet	50.0000	51.5215	103.04	50-150
33	2,2-Dichloropropan	50.0000	58.0618	116.12	50-150
34	Bromochloromethane	50.0000	52.0592	104.12	50-150
35	Cyclohexane	50.0000	54.1860	108.37	50-150
36	Chloroform	50.0000	50.6512	101.30	50-150
37	Ethyl acetate	50.0000	52.1326	104.27	50-150
38	Methyl acrylate	50.0000	52.0846	104.17	50-150
39	Carbon Tetrachlori	50.0000	52.1876	104.38	50-150
40	Tetrahydrofuran	250.000	262.021	104.81	50-150

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
42	1,1,1-Trichloroeth	50.0000	52.5218	105.04	50-150
43	2-Butanone	250.000	269.142	107.66	50-150
44	1,1-Dichloropropen	50.0000	52.1980	104.40	50-150
45	1-Chlorobutane	50.0000	50.9164	101.83	50-150
46	Heptane	50.0000	54.4602	108.92	50-150
47	Benzene	50.0000	51.9926	103.99	50-150
48	Propionitrile	250.000	312.531	125.01	50-150
49	Methacrylonitrile	50.0000	50.7535	101.51	50-150
50	tert-amyl methyl E	50.0000	50.5140	101.03	50-150
54	Isobutyl alcohol	500.000	846.126	169.23*	50-150
52	1,2-Dichloroethane	50.0000	50.2739	100.55	50-150
53	tert-Amyl Alcohol	250.000	400.415	160.17*	50-150
56	Diisobutylene	50.0000	51.8413	103.68	50-150
57	Trichloroethene	50.0000	50.2002	100.40	50-150
58	Methyl cyclohexane	50.0000	51.8077	103.62	50-150
59	tert-Amyl Ethyleth	50.0000	54.6183	109.24	50-150
60	Dibromomethane	50.0000	49.7062	99.41	50-150
61	1,2-Dichloropropan	50.0000	52.9697	105.94	50-150
62	Bromodichlorometha	50.0000	53.9787	107.96	50-150
63	Methyl methacrylat	50.0000	53.9620	107.92	50-150
64	1,4-Dioxane	1250.00	971.381	77.71	50-150
65	2-Chloroethylvinyl	50.0000	45.1100	90.22	50-150
66	cis-1,3-Dichloropr	50.0000	55.2516	110.50	50-150
67	Octane	50.0000	51.9491	103.90	50-150
69	Toluene	50.0000	51.5298	103.06	50-150
70	Chloroacetonitrile	250.000	374.970	149.99	50-150
71	2-Nitropropane	250.000	251.619	100.65	50-150
72	1,1-Dichloro-2-pro	250.000	265.132	106.05	50-150
73	4-Methyl-2-Pentano	250.000	259.498	103.80	50-150
74	Tetrachloroethene	50.0000	46.2459	92.49	50-150
75	trans-1,3-Dichloro	50.0000	55.1525	110.31	50-150
76	Ethyl methacrylate	50.0000	47.1611	94.32	50-150
77	1,1,2-Trichloroeth	50.0000	49.5087	99.02	50-150
78	Chlorodibromometha	50.0000	52.8968	105.79	50-150
80	1,2-Dibromoethane	50.0000	51.0960	102.19	50-150
81	2-Hexanone	250.000	233.784	93.51	50-150
82	1-Chlorohexane	50.0000	56.1305	112.26	50-150
79	1,3-Dichloropropan	50.0000	50.7183	101.44	50-150
84	Chlorobenzene	50.0000	50.0402	100.08	50-150
85	Ethylbenzene	50.0000	50.3608	100.72	50-150
86	1,1,1,2-Tetrachlor	50.0000	50.8968	101.79	50-150
87	mp-Xylene	100.000	104.830	104.83	50-150
88	o-Xylene	50.0000	53.3558	106.71	50-150
89	Styrene	50.0000	52.9429	105.89	50-150
90	Bromoform	50.0000	49.1841	98.37	50-150
91	Isopropylbenzene	50.0000	52.5445	105.09	50-150
93	Bromobenzene	50.0000	48.7511	97.50	50-150
94	n-Propylbenzene	50.0000	52.6545	105.31	50-150
95	1,1,2,2-Tetrachlor	50.0000	48.9857	97.97	50-150
96	o-Chlorotoluene	50.0000	50.9475	101.90	50-150
M 100	1,2-Dichloroethene	100.000	101.113	101.11	50-150
97	1,3,5-Trimethylben	50.0000	53.3029	106.61	50-150
98	1,2,3-Trichloropro	50.0000	47.9569	95.91	50-150
99	trans-1,4-Dichloro	50.0000	41.9929	83.99	50-150

	SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
	101 p-Chlorotoluene	50.0000	51.2520	102.50	50-150
	102 tert-Butylbenzene	50.0000	52.5569	105.11	50-150
	103 Pentachloroethane	50.0000	53.5208	107.04	50-150
	104 1,2,4-Trimethylben	50.0000	53.8634	107.73	50-150
	105 sec-Butylbenzene	50.0000	52.5749	105.15	50-150
	106 p-Isopropyltoluene	50.0000	53.5050	107.01	50-150
	107 1,3-Dichlorobenzen	50.0000	49.3419	98.68	50-150
	109 1,4-Dichlorobenzen	50.0000	47.8014	95.60	50-150
	110 Benzyl Chloride	50.0000	56.9737	113.95	50-150
	111 n-Butylbenzene	50.0000	55.2192	110.44	50-150
	112 Hexachloroethane	50.0000	52.4558	104.91	50-150
	113 1,2-Dichlorobenzen	50.0000	49.9560	99.91	50-150
	114 1,2-Dibromo-3-chlo	50.0000	48.1873	96.37	50-150
	115 Nitrobenzene	500.000	522.226	104.45	50-150
	116 Hexachlorobutadien	50.0000	47.6825	95.36	50-150
	117 1,2,4-Trichloroben	50.0000	45.6312	91.26	50-150
	118 Naphthalene	50.0000	43.0235	86.05	50-150
M	120 1,3-Dichloropropen	100.000	110.404	110.40	50-150
	119 1,2,3-Trichloroben	50.0000	44.8956	89.79	50-150
M	121 TOTAL XYLENES	150.000	158.185	105.46	50-150

	SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$	41 Dibromofluorometha	49.9980	51.4148	102.83	80-119
$	51 1,2-Dichloroethane	49.9980	50.5809	101.17	81-118
$	68 Toluene-d8	49.9980	51.6684	103.34	89-112
$	92 4-Bromofluorobenze	49.9980	52.1137	104.23	85-114

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.

3017123

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-030

Lab File ID: 719092566.D Lab Sample ID: 3017123

Date Analyzed: 9/26/2019 Time Analyzed: 01:36

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: ms07.i

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
3017124(LCS)	3017124	719092562.D	00:06
03TB02-20190918	3059231001	719092568.D	02:21
03DUP01-20190918	3059231002	719092575.D	04:59

COMMENTS:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3017123(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3017123

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092566.D

Level (low/med): Date Received: 9/25/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3017123(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3017123

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092566.D

Level (low/med): Date Received: 9/25/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-030

Lab File ID: 719092600.D BFB Injection Date: 9/26/2019

Instrument ID: ms07.i BFB Injection Time: 22:31

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: Y/N N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.3
75	30.0 - 60.0% of mass 95	46.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.5(0.6) 1
174	50.0 - 100.0% of mass 95	78.3
175	5.0 - 9.0% of mass 174	6.1 (7.8) 1
176	95.0 - 101.0% of mass 174	76.7 (97.9) 1
177	5.0 - 9.0% of mass 176	5.1 (6.7) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
VSTD00.5	VSTD00.5	719092603.D	9/26/2019	23:47
1234	1234	719092604.D	9/27/2019	00:09
1235	1235	719092605.D	9/27/2019	00:32
1236	1236	719092606.D	9/27/2019	00:54
1237	1237	719092607.D	9/27/2019	01:17
1238	1238	719092608.D	9/27/2019	01:40
1239	1239	719092609.D	9/27/2019	02:02
3017576(LCS)	3017576	719092612.D	9/27/2019	03:10
3017575(MB)	3017575	719092616.D	9/27/2019	04:40
03RB01-20190918	3059231007	719092617.D	9/27/2019	05:03
03MW04SI-20190918	3059231003	719092619.D	9/27/2019	05:48
03MW04S-20190918	3059231004	719092620.D	9/27/2019	06:11
03MW07S-20190918	3059231005	719092621.D	9/27/2019	06:33
03MW09IS-20190918	3059231006	719092622.D	9/27/2019	06:56
1801	1801	719092627.D	9/27/2019	08:49

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Acetone	0.01346	0.01779		A		0.014940		9.72530
Acrolein	0.04084	0.04027		A		0.039280		6.37445
Acrylonitrile	0.06764	0.05726		A		0.063960		7.48448
Acetonitrile	0.01137	0.01469		A		0.012140		10.60283
tert-Amyl Ethylether	0.50183	0.34883		A		0.431230		14.53917
tert-Amyl methyl ether	0.57569	0.43607		A		0.507550		10.99936
tert-Amyl Alcohol	0.00636	0.00621		A		0.006130		10.95928
Benzene	0.83536	0.83979		A		0.863580		4.27288
Benzyl Chloride	1148860	799		Q	0.000000	0.182610	0.005810	0.99977
Bromobenzene	0.57168	0.67537		A		0.603220		6.21513
Bromochloromethane	0.09923	0.11428		A		0.103900		6.20292
Bromodichloromethane	0.28973	0.22831		A		0.261030		10.51595
Bromoform *	0.37635	0.26183		A		0.324970		14.27814
Bromomethane	0.11006	0.12510		A		0.110350		6.71732
2-Butanone	0.02406	0.02174		A		0.023040		9.18130
tert.- Butyl Alcohol		1348		Q	0.000000	0.006570	0.000050	0.99927
tert-Butylbenzene	0.46494	0.37327		A		0.433520		11.07836
n-Butylbenzene	2479163	3028		Q	0.000000	0.410350	0.009990	0.99992
sec-Butylbenzene	2.31698	1.82224		A		2.217760		13.53333
Carbon Disulfide	0.63450	0.83838		A		0.658870		12.65808
Carbon Tetrachloride	0.28072	0.21948		A		0.250810		11.30024
Chloroacetonitrile	325357	713		L	0.000000	91.459923		0.99597
Chlorobenzene *	1.24804	1.38707		A		1.289350		3.68634
1-Chlorobutane	0.23863	0.23415		A		0.232910		2.76667
Chlorodibromomethane	0.51497	0.35990		A		0.432090		14.90078
Chloroethane	2210817	10662		Q	0.000000	0.179860	-0.003840	0.99983
2-Chloroethylvinyl ether	1680573	1897		L	0.000000	8.698240		0.99746
Chloroform **	0.39320	0.41264		A		0.396520		2.78577
1-Chlorohexane	4624078	6113		L	0.000000	1.324940		0.99967
Chloromethane *	0.25769	0.31838		A		0.270750		8.38752
Chloroprene	0.33818	0.28625		A		0.319790		7.48917
3-Chloro-1-propene	0.29895	0.28625		A		0.288050		6.58258
o-Chlorotoluene	1.88749	1.87318		A		1.898370		5.25915
p-Chlorotoluene	1.73718	1.72849		A		1.740830		4.85164
Cyclohexane	0.35738	0.28203		A		0.333870		10.50344
1,2-Dibromo-3-Chloropropane	507424	416		Q	0.000000	0.083760	0.002090	0.99968

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2-Dibromoethane	0.44954	0.38977		A		0.412840		7.84078
Dibromomethane	0.13391	0.12901		A		0.127720		4.23322
trans-1,4-Dichloro-2-butene	907411	1139		L	0.000000	5.779770		0.99935
1,2-Dichlorobenzene	0.96870	0.99943		A		0.938890		5.57942
1,3-Dichlorobenzene	1.06896	1.13995		A		1.047610		5.49156
1,4-Dichlorobenzene	1.04361	1.36325		A		1.094890		10.90314
Dichlorodifluoromethane	0.32073	0.30639		A		0.315050		5.12120
1,1-Dichloroethane *	0.37688	0.33502		A		0.364390		5.71218
1,2-Dichloroethene, Total	0.29385	0.29313		A		0.287870		2.37424
1,2-Dichloroethane	0.26320	0.26616		A		0.258480		2.93002
1,1-Dichloroethene **	0.27772	0.25226		A		0.254890		8.01169
cis-1,2-Dichloroethene	0.30282	0.30027		A		0.296900		1.99153
trans-1,2-Dichloroethene	0.28487	0.28600		A		0.278830		2.88111
Dichlorofluoromethane	0.36578	0.35784		A		0.369580		4.27659
1,1-Dichloro-2-Propanone	297043	413		L	0.000000	104		0.99922
2,2-Dichloropropane	0.29987	0.26023		A		0.276230		6.47745
1,3-Dichloropropane	0.77653	0.70408		A		0.744640		3.90206
1,2-Dichloropropane **	0.23871	0.19839		A		0.223150		7.32027
1,1-Dichloropropene	0.31971	0.28806		A		0.305070		5.23212
cis-1,3-Dichloropropene	0.85006	0.67531		A		0.744720		11.40394
trans-1,3-Dichloropropene	0.75815	0.60583		A		0.668270		11.45731
1,3-Dichloropropene, Total	0.80411	0.64057		A		0.706500		11.42265
Diisobutylene	8679520	80914		L	0.000000	1.675240		0.99851
Diisopropyl ether	0.67927	0.56837		A		0.640840		8.00127
1,4-Dioxane	129781			L	0.000000	2747		0.99473
Ethyl Acetate	0.20033	0.18433		A		0.187650		6.82027
Ethyl ether	0.12322	0.11877		A		0.116710		8.92665
Ethyl Methacrylate	4239907	5839		L	0.000000	1.451750		0.99950
Ethyl tert-butyl ether	0.62689	0.48414		A		0.568690		10.65261
Ethylbenzene **	0.71294	0.71766		A		0.701270		3.97217
Freon 113	0.21835	0.20312		A		0.204460		7.47496
Heptane	2390722	3875		Q	0.000000	0.117870	0.007350	0.99988
Hexachlorobutadiene	1036524	2507		Q	0.000000	0.148040	0.007700	0.99988
Hexachloroethane	2049078	2344		Q	0.000000	0.321780	0.010890	0.99997
Hexane	0.46599	0.34686		A		0.414460		11.61912
2-Hexanone	4490045	7376		L	0.000000	6.836340		0.99960

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Iodomethane	1382757	690		Q	0.000000	0.065470	0.004760	0.99724
Isobutyl alcohol	168180	517		L	0.000000	850		0.99968
Isopropyl Alcohol		1185		Q	0.000000	0.001570	0.000040	0.99988
Isopropylbenzene	2.34275	2.19256		A		2.430030		8.73367
p-Isopropyltoluene	2844196	3485		L	0.000000	1.852440		0.99897
Methyl acetate	0.03283	0.02783		A		0.032370		14.36391
Methyl acrylate	0.19858	0.16360		A		0.183850		9.68054
Methacrylonitrile	0.09031	0.07986		A		0.086520		8.90228
Methyl cyclohexane	0.95878	0.63939		A		0.825020		14.41250
Methyl methacrylate	2678305	4234		L	0.000000	5.366240		0.99972
Methyl t-Butyl Ether	0.55841	0.44727		A		0.517460		8.69166
4-Methyl-2-Pentanone(MIBK)	8879024	12389		L	0.000000	3.448350		0.99966
Methylene Chloride	2899030	9497		L	0.000000	4.978390		0.99930
Naphthalene		2728		Q	0.000000	0.638090	0.099290	0.99418
Nitrobenzene	450615			Q	0.000000	0.001710	0.000100	0.99898
2-Nitropropane	3447114	4933		L	0.000000	8.927850		0.99943
Octane	1511894	3305		Q	0.000000	0.166900	0.012050	0.99968
Pentachloroethane	0.40458	0.35670		A		0.379580		6.69181
Pentane	0.19020	0.20506		A		0.207150		7.50739
n-Propanol	0.01128	0.01190		A		0.011440		3.63945
Propionitrile	0.02073	0.02107		A		0.021570		7.15448
n-Propylbenzene	0.68317	0.55010		A		0.654040		10.64739
Styrene	1.58580	1.48293		A		1.557650		7.34088
1,1,1,2-Tetrachloroethane	0.46619	0.36484		A		0.414500		9.53153
1,1,2,2-Tetrachloroethane *	0.64083	0.66296		A		0.659920		3.10559
Tetrachloroethene	0.44703	0.43897		A		0.431410		3.81941
Tetrahydrofuran	0.05266	0.05143		A		0.051910		7.32001
Toluene **	1.24124	1.16688		A		1.208190		5.01601
Total Xylenes	0.82971	0.74878		A		0.796160		7.88005
1,2,3-Trichlorobenzene	2094670	1021		Q	0.000000	0.310050	0.014020	0.99934
1,2,4-Trichlorobenzene	2649638	1171		Q	0.000000	0.397690	0.016900	0.99954
1,1,1-Trichloroethane	0.31645	0.26607		A		0.290180		8.17051
1,1,2-Trichloroethane	0.37765	0.34913		A		0.359400		4.47380
Trichloroethene	0.23226	0.28984		A		0.242780		8.77286
Trichlorofluoromethane	0.33458	0.35633		A		0.359340		5.21498
1,2,3-Trichloropropane	0.18180	0.18892		A		0.189450		3.42303

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2,4-Trimethylbenzene	1.91349	1.50987		A		1.830300		12.00362
1,3,5-Trimethylbenzene	1.87638	1.54627		A		1.822430		11.60222
Vinyl Acetate	692025	986		Q	0.000000	0.041410	0.001050	0.99980
Vinyl Chloride **	0.30496	0.30731		A		0.306960		4.23454
o-Xylene	0.84888	0.68756		A		0.765860		11.26823
mp-Xylene	0.82013	0.77940		A		0.811300		6.57880
4-Bromofluorobenzene	0.52575	0.64131		A		0.556540		6.97396
Dibromofluoromethane	0.18276	0.19174		A		0.184540		2.32737
1,2-Dichloroethane-d4	0.20174	0.22815		A		0.208420		4.64370
Toluene-d8	1.56860	1.73642		A		1.653020		3.56307

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.
SPCC Compounds (*) with required minimum RRF.
CCC Compounds (**) with required maximum %RSD.

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Laboratory Control Spike - Sample No: 3017576

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Acetone	100		115	115	(80-120)
Benzene	20		21.5	108	(80-120)
Bromochloromethane	20		20.5	102	(80-120)
Bromodichloromethane	20		21.4	107	(80-120)
Bromoform	20		21.8	109	(80-120)
Bromomethane	20		14.5	72.6*	(80-120)
2-Butanone	100		122	122*	(80-120)
Carbon Disulfide	20		20.7	104	(80-120)
Carbon Tetrachloride	20		22.9	114	(80-120)
Chlorobenzene	20		20.1	100	(80-120)
Chlorodibromomethane	20		20.9	105	(80-120)
Chloroethane	20		17.8	89	(80-120)
Chloroform	20		20.5	103	(80-120)
Chloromethane	20		19.2	95.9	(80-120)
Cyclohexane	20		23.0	115	(80-120)
1,2-Dibromo-3-Chloropro	20		19.8	98.8	(80-120)
1,2-Dibromoethane	20		20.3	101	(80-120)
1,2-Dichlorobenzene	20		20.4	102	(80-120)
1,3-Dichlorobenzene	20		20.3	101	(80-120)
1,4-Dichlorobenzene	20		19.5	97.6	(80-120)
Dichlorodifluoromethane	20		18.0	90.1	(80-120)
1,1-Dichloroethane	20		23.4	117	(80-120)
1,2-Dichloroethane	20		20.7	104	(80-120)
1,1-Dichloroethene	20		27.0	135*	(80-120)
cis-1,2-Dichloroethene	20		21.0	105	(80-120)
trans-1,2-Dichloroethen	20		24.4	122*	(80-120)
1,2-Dichloropropane	20		21.5	107	(80-120)
cis-1,3-Dichloropropene	20		21.0	105	(80-120)
trans-1,3-Dichloroprope	20		21.1	106	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 6 out of 51 outside limits

Comments:

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Laboratory Control Spike - Sample No: 3017576

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
1,4-Dioxane	500		903	181*	(80-120)
Ethylbenzene	20		20.7	103	(80-120)
Freon 113	20		20.9	105	(80-120)
2-Hexanone	100		95.0	95	(80-120)
Isopropylbenzene	20		22.7	114	(80-120)
Methyl acetate	20		25.4	127*	(80-120)
Methyl cyclohexane	20		22.7	114	(80-120)
Methyl t-Butyl Ether	20		21.8	109	(80-120)
4-Methyl-2-Pentanone(MI	100		97.1	97.1	(80-120)
Methylene Chloride	20		22.0	110	(80-120)
Styrene	20		21.6	108	(80-120)
1,1,2,2-Tetrachloroetha	20		21.0	105	(80-120)
Tetrachloroethene	20		21.2	106	(80-120)
Toluene	20		20.9	104	(80-120)
Total Xylenes	60		64.0	107	(80-120)
1,2,3-Trichlorobenzene	20		17.9	89.7	(80-120)
1,2,4-Trichlorobenzene	20		18.8	94	(80-120)
1,1,1-Trichloroethane	20		23.2	116	(80-120)
1,1,2-Trichloroethane	20		20.4	102	(80-120)
Trichloroethene	20		20.2	101	(80-120)
Trichlorofluoromethane	20		19.9	99.5	(80-120)
Vinyl Chloride	20		19.5	97.6	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 6 out of 51 outside limits

Comments:

ALS Environmental Services

RECOVERY REPORT

Client Name: Client SDG: 7190926.b
Sample Matrix: LIQUID Fraction: VOA
Lab Smp Id: 1801
Level: LOW Operator: PDK
Data Type: MS DATA SampleType: LCS
SpikeList File: DODENDCCV.spk Quant Type: ISTD
Sublist File: DODall.sub
Method File: \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190926.b\7-8260b09
Misc Info:

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
1	Dichlorodifluorome	50.0000	49.4331	98.87	50-150
2	Chloromethane	50.0000	46.6327	93.27	50-150
3	Vinyl Chloride	50.0000	49.2228	98.45	50-150
4	Bromomethane	50.0000	31.2470	62.49	50-150
5	Chloroethane	50.0000	46.4798	92.96	50-150
6	Pentane	50.0000	48.9894	97.98	50-150
7	Trichlorofluoromet	50.0000	50.2190	100.44	50-150
8	Dichlorofluorometh	50.0000	50.4643	100.93	50-150
9	Ethyl Ether	50.0000	50.3649	100.73	50-150
10	1,1-Dichloroethene	50.0000	53.4668	106.93	50-150
11	Freon 113	50.0000	51.4714	102.94	50-150
12	Carbon Disulfide	50.0000	49.2225	98.44	50-150
13	Iodomethane	50.0000	37.8290	75.66	50-150
14	Acrolein	250.000	246.563	98.63	50-150
15	Isopropyl Alcohol	250.000	289.127	115.65	50-150
16	3-Chloro-1-propene	50.0000	48.3260	96.65	50-150
17	Methylene Chloride	50.0000	48.7029	97.41	50-150
18	Acetone	250.000	247.747	99.10	50-150
19	Methyl acetate	50.0000	55.9541	111.91	50-150
20	trans-1,2-Dichloro	50.0000	50.2654	100.53	50-150
21	Hexane	50.0000	51.6499	103.30	50-150
22	Methyl t-Butyl Eth	50.0000	51.4378	102.88	50-150
23	tert.- Butyl Alcoh	250.000	280.406	112.16	50-150
24	Acetonitrile	250.000	275.892	110.36	50-150
25	Diisopropyl ether	50.0000	51.1359	102.27	50-150
26	Chloroprene	50.0000	51.9437	103.89	50-150
27	1,1-Dichloroethane	50.0000	51.1598	102.32	50-150
28	Acrylonitrile	250.000	259.711	103.88	50-150
30	n-Propanol	500.000	495.126	99.03	50-150
29	Ethyl tert-butyl e	50.0000	51.5410	103.08	50-150
31	Vinyl acetate	50.0000	48.3100	96.62	50-150
32	cis-1,2-Dichloroet	50.0000	49.3541	98.71	50-150
33	2,2-Dichloropropan	50.0000	45.7196	91.44	50-150
34	Bromochloromethane	50.0000	49.7825	99.56	50-150
35	Cyclohexane	50.0000	53.1752	106.35	50-150
36	Chloroform	50.0000	48.9869	97.97	50-150
37	Ethyl acetate	50.0000	52.5525	105.11	50-150
38	Methyl acrylate	50.0000	53.8258	107.65	50-150
39	Carbon Tetrachlori	50.0000	52.5352	105.07	50-150
40	Tetrahydrofuran	250.000	276.721	110.69	50-150

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
42	1,1,1-Trichloroeth	50.0000	52.0201	104.04	50-150
43	2-Butanone	250.000	278.470	111.39	50-150
44	1,1-Dichloropropen	50.0000	50.7760	101.55	50-150
45	1-Chlorobutane	50.0000	50.0906	100.18	50-150
46	Heptane	50.0000	53.0645	106.13	50-150
47	Benzene	50.0000	50.9223	101.84	50-150
48	Propionitrile	250.000	276.428	110.57	50-150
49	Methacrylonitrile	50.0000	53.9036	107.81	50-150
50	tert-amyl methyl E	50.0000	49.3869	98.77	50-150
54	Isobutyl alcohol	500.000	477.867	95.57	50-150
52	1,2-Dichloroethane	50.0000	48.6232	97.25	50-150
53	tert-Amyl Alcohol	250.000	302.841	121.14	50-150
56	Diisobutylene	50.0000	49.9800	99.96	50-150
57	Trichloroethene	50.0000	47.3009	94.60	50-150
58	Methyl cyclohexane	50.0000	53.0644	106.13	50-150
59	tert-Amyl Ethyleth	50.0000	52.8253	105.65	50-150
60	Dibromomethane	50.0000	48.8147	97.63	50-150
61	1,2-Dichloropropan	50.0000	51.5438	103.09	50-150
62	Bromodichlorometha	50.0000	52.1827	104.37	50-150
63	Methyl methacrylat	50.0000	49.2121	98.42	50-150
64	1,4-Dioxane	1250.00	669.709	53.58	50-150
65	2-Chloroethylvinyl	50.0000	43.4490	86.90	50-150
66	cis-1,3-Dichloropr	50.0000	50.0826	100.17	50-150
67	Octane	50.0000	52.9237	105.85	50-150
69	Toluene	50.0000	50.3049	100.61	50-150
70	Chloroacetonitrile	250.000	266.573	106.63	50-150
71	2-Nitropropane	250.000	238.445	95.38	50-150
72	1,1-Dichloro-2-pro	250.000	247.467	98.99	50-150
73	4-Methyl-2-Pentano	250.000	249.358	99.74	50-150
74	Tetrachloroethene	50.0000	50.6179	101.24	50-150
75	trans-1,3-Dichloro	50.0000	50.4539	100.91	50-150
76	Ethyl methacrylate	50.0000	46.4985	93.00	50-150
77	1,1,2-Trichloroeth	50.0000	49.2816	98.56	50-150
78	Chlorodibromometha	50.0000	51.6506	103.30	50-150
80	1,2-Dibromoethane	50.0000	50.3083	100.62	50-150
81	2-Hexanone	250.000	240.978	96.39	50-150
82	1-Chlorohexane	50.0000	46.6676	93.34	50-150
79	1,3-Dichloropropan	50.0000	49.4802	98.96	50-150
84	Chlorobenzene	50.0000	48.7185	97.44	50-150
85	Ethylbenzene	50.0000	49.9773	99.95	50-150
86	1,1,1,2-Tetrachlor	50.0000	51.3246	102.65	50-150
87	mp-Xylene	100.000	103.196	103.20	50-150
88	o-Xylene	50.0000	52.5274	105.05	50-150
89	Styrene	50.0000	51.3305	102.66	50-150
90	Bromoform	50.0000	51.4877	102.98	50-150
91	Isopropylbenzene	50.0000	52.9133	105.83	50-150
93	Bromobenzene	50.0000	47.6565	95.31	50-150
94	n-Propylbenzene	50.0000	52.6517	105.30	50-150
95	1,1,2,2-Tetrachlor	50.0000	50.1883	100.38	50-150
96	o-Chlorotoluene	50.0000	50.4589	100.92	50-150
M 100	1,2-Dichloroethene	100.000	99.6194	99.62	50-150
97	1,3,5-Trimethylben	50.0000	53.4385	106.88	50-150
98	1,2,3-Trichloropro	50.0000	50.3967	100.79	50-150
99	trans-1,4-Dichloro	50.0000	43.9703	87.94	50-150

	SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
	101 p-Chlorotoluene	50.0000	50.0865	100.17	50-150
	102 tert-Butylbenzene	50.0000	52.8065	105.61	50-150
	103 Pentachloroethane	50.0000	46.9012	93.80	50-150
	104 1,2,4-Trimethylben	50.0000	53.3317	106.66	50-150
	105 sec-Butylbenzene	50.0000	54.6903	109.38	50-150
	106 p-Isopropyltoluene	50.0000	48.4714	96.94	50-150
	107 1,3-Dichlorobenzen	50.0000	48.3101	96.62	50-150
	109 1,4-Dichlorobenzen	50.0000	45.7252	91.45	50-150
	110 Benzyl Chloride	50.0000	41.1273	82.25	50-150
	111 n-Butylbenzene	50.0000	52.0055	104.01	50-150
	112 Hexachloroethane	50.0000	49.9970	99.99	50-150
	113 1,2-Dichlorobenzen	50.0000	48.2756	96.55	50-150
	114 1,2-Dibromo-3-chlo	50.0000	49.2004	98.40	50-150
	115 Nitrobenzene	500.000	252.999	50.60	50-150
	116 Hexachlorobutadien	50.0000	55.0433	110.09	50-150
	117 1,2,4-Trichloroben	50.0000	47.3929	94.79	50-150
	118 Naphthalene	50.0000	48.5814	97.16	50-150
M	120 1,3-Dichloropropen	100.000	100.536	100.54	50-150
	119 1,2,3-Trichloroben	50.0000	47.6864	95.37	50-150
M	121 TOTAL XYLENES	150.000	155.723	103.82	50-150

	SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$	41 Dibromofluorometha	49.9980	48.0356	96.08	80-119
$	51 1,2-Dichloroethane	49.9980	47.0890	94.18	81-118
$	68 Toluene-d8	49.9980	47.8766	95.76	89-112
$	92 4-Bromofluorobenze	49.9980	49.6578	99.32	85-114

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.

3017575

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-030

Lab File ID: 719092616.D Lab Sample ID: 3017575

Date Analyzed: 9/27/2019 Time Analyzed: 04:40

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: ms07.i

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
3017576(LCS)	3017576	719092612.D	03:10
03RB01-20190918	3059231007	719092617.D	05:03
03MW04SI-20190918	3059231003	719092619.D	05:48
03MW04S-20190918	3059231004	719092620.D	06:11
03MW07S-20190918	3059231005	719092621.D	06:33
03MW09IS-20190918	3059231006	719092622.D	06:56

COMMENTS:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3017575(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3017575

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092616.D

Level (low/med): Date Received: 9/25/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3017575(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3017575

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092616.D

Level (low/med): Date Received: 9/25/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: EPR-030

	Sample NO.	SMC1 (BFB) #		SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
01	3017124(LCS)	111		102	103	105	0
02	3017123(MB)	116	*	102	106	105	1
03	03TB02-20190918	118	*	102	107	106	1
04	03DUP01-20190918	116	*	103	109	106	1

	QC LIMITS
SMC1 (BFB) = 4-Bromofluorobenzene	(76-119)
SMC2 (DBFM) = Dibromofluoromethane	(85-115)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(72-119)
SMC4 (TOL) = Toluene-d8	(81-120)

Column to be used to flag recovery values

* Values outside of contract required QC Limits

D Surrogate Diluted Out

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: EPR-030

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
05	3017576(LCS)	108	99.3	98.2	97.7	0
06	3017575(MB)	112	99.3	103	99.9	0
07	03RB01-20190918	114	98.2	103	101	0
08	03MW04SI-20190918	112	98.4	102	101	0
09	03MW04S-20190918	114	100	104	101	0
10	03MW07S-20190918	115 *	100	104	101	1
11	03MW09IS-20190918	114	98.2	102	101	0

	QC LIMITS
SMC1 (BFB) = 4-Bromofluorobenzene	(76-119)
SMC2 (DBFM) = Dibromofluoromethane	(85-115)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(72-119)
SMC4 (TOL) = Toluene-d8	(81-120)

Column to be used to flag recovery values

* Values outside of contract required QC Limits

D Surrogate Diluted Out

8Az

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Lab File ID: 719092557.D Date Analyzed: 9/25/2019

Instrument ID: ms07.i Time Analyzed: 22:12

GC Column: RTXVRX ID: 0.2 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT#	IS2 AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	843306	6.056	678577	7.825	1955716	4.061
UPPER LIMIT	1686612	6.226	1357154	7.995	3911432	4.231
LOWER LIMIT	421653	5.886	339289	7.655	977858	3.891
SAMPLE NO.						
3017124(LCS)	882554	6.053	698400	7.824	2066194	4.058
3017123(MB)	817954	6.053	580265	7.825	1976071	4.061
03TB02-20190918	796235	6.056	556623	7.825	1907035	4.061
03DUP01-20190918	766980	6.056	545066	7.822	1844937	4.061
1801	854251	6.055	681500	7.824	1944067	4.061

IS1 = Chlorobenzene-d5
IS2 = 1,4-Dichlorobenzene-d4
IS3 = Fluorobenzene

AREA UPPER LIMIT = +2% of internal standard area
AREA LOWER LIMIT = -1% of internal standard area
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8Az

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Lab File ID: 719092607.D Date Analyzed: 9/27/2019

Instrument ID: ms07.i Time Analyzed: 01:17

GC Column: RTXVRX ID: 0.2 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT#	IS2 AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	883686	6.053	715389	7.822	2024453	4.061
UPPER LIMIT	1767372	6.223	1430778	7.992	4048906	4.231
LOWER LIMIT	441843	5.883	357695	7.652	1012227	3.891
SAMPLE NO.						
3017576(LCS)	906591	6.053	704814	7.824	2043412	4.061
3017575(MB)	838721	6.056	605986	7.825	1972704	4.061
03RB01-20190918	820729	6.055	584496	7.825	1952860	4.061
03MW04SI-20190918	809402	6.055	587689	7.824	1934338	4.061
03MW04S-20190918	808971	6.056	585030	7.825	1918379	4.061
03MW07S-20190918	804685	6.053	579963	7.825	1903959	4.061
03MW09IS-20190918	792146	6.053	561067	7.825	1879190	4.061
1801	867555	6.055	701195	7.824	1954668	4.061

IS1 = Chlorobenzene-d5
IS2 = 1,4-Dichlorobenzene-d4
IS3 = Fluorobenzene

AREA UPPER LIMIT = +2% of internal standard area
AREA LOWER LIMIT = -1% of internal standard area
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

Total Metals by Method 6020 Summary Forms

6020 3015 DOD

- COVER PAGE -

INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc.

SDG No.: EPR-030 **Method Type:** 6020 3015 DOD **SOW No.:**

Contract: EPR030|Willow Grove **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
3059231002	03DUP01-20190918	
3059231003	03MW04SI-20190918	
3059231004	03MW04S-20190918	
3059231005	03MW07S-20190918	
3059231006	03MW09IS-20190918	
3059231007	03RB01-20190918	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments:_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: **Matthew Olley**

Date: _____ Title: **Metals Supervisor**

6020 3015 DOD

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-030

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092619D 030

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	0306																										
BLK	1.00	0309		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
STANDARD 5	1.00	0312		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0316																										
ZZZZZZ	1.00	0319																										
ICB	1.00	0322		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
LLICV	1.00	0325		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0333																										
ICV	1.00	0337		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0340																										
ICSAB	1.00	0343		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0347																										
ZZZZZZ	1.00	0350																										
ICSA	1.00	0353		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0356																										
MB for HBN 544196 [	1.00	0403		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
LCS for HBN 544196 [	1.00	0406		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0409																										
ZZZZZZ	1.00	0413																										
ZZZZZZ	1.00	0416																										
ZZZZZZ	1.00	0419																										
ZZZZZZ	1.00	0422																										
ZZZZZZ	1.00	0426																										
ZZZZZZ	1.00	0429																										
ZZZZZZ	1.00	0432																										
CCV	1.00	0436		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
CCB	1.00	0439		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0443																										
03DUP01-20190918	1.00	0446		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW04SI-20190918	1.00	0450		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW04S-20190918	1.00	0453		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW07S-20190918	1.00	0456		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW09IS-20190918	1.00	0500		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03RB01-20190918	1.00	0503		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0506																										
ZZZZZZ	1.00	0510																										

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-030

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092619D 030

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	0513																										
ZZZZZZ	1.00	0516																										
CCB	1.00	0519		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X			
ZZZZZZ	1.00	0524																										
CCV	1.00	0527		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X			
ZZZZZZ	1.00	0530																										
ZZZZZZ	1.00	0534																										
ZZZZZZ	1.00	0537																										
ZZZZZZ	1.00	0540																										
ZZZZZZ	1.00	0544																										
ZZZZZZ	1.00	0550																										
ZZZZZZ	1.00	0555																										
ZZZZZZ	1.00	0558																										
ZZZZZZ	1.00	0601																										

6020 3015 DOD

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
LLICV										
	Aluminum	0.0767	0.0800	96		80 - 120	M	9/26/2019	03:25	A092619D 0
	Antimony	0.0021	0.0020	105		80 - 120	M	9/26/2019	03:25	A092619D 0
	Barium	0.0053	0.0050	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Beryllium	0.0011	0.0010	110		80 - 120	M	9/26/2019	03:25	A092619D 0
	Cadmium	0.0011	0.0010	110		80 - 120	M	9/26/2019	03:25	A092619D 0
	Calcium	0.1094	0.1000	109		80 - 120	M	9/26/2019	03:25	A092619D 0
	Chromium	0.0017	0.0020	85		80 - 120	M	9/26/2019	03:25	A092619D 0
	Cobalt	0.0049	0.0050	98		80 - 120	M	9/26/2019	03:25	A092619D 0
	Lead	0.0021	0.0020	105		80 - 120	M	9/26/2019	03:25	A092619D 0
	Magnesium	0.1073	0.1000	107		80 - 120	M	9/26/2019	03:25	A092619D 0
	Manganese	0.0052	0.0050	104		80 - 120	M	9/26/2019	03:25	A092619D 0
	Nickel	0.0053	0.0050	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Potassium	0.1161	0.1000	116		80 - 120	M	9/26/2019	03:25	A092619D 0
	Silver	0.0019	0.0020	95		80 - 120	M	9/26/2019	03:25	A092619D 0
	Sodium	0.1058	0.1000	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Thallium	0.0010	0.0010	100		80 - 120	M	9/26/2019	03:25	A092619D 0
	Vanadium	0.0018	0.0020	90		80 - 120	M	9/26/2019	03:25	A092619D 0
ICV										
	Aluminum	0.1007	0.1000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Antimony	0.0977	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Barium	0.1005	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Beryllium	0.1037	0.1000	104		90 - 110	M	9/26/2019	03:37	A092619D 0
	Cadmium	0.0996	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Calcium	1.0176	1.0000	102		90 - 110	M	9/26/2019	03:37	A092619D 0
	Chromium	0.1026	0.1000	103		90 - 110	M	9/26/2019	03:37	A092619D 0
	Cobalt	0.0981	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Lead	0.1007	0.1000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Magnesium	1.0453	1.0000	105		90 - 110	M	9/26/2019	03:37	A092619D 0
	Manganese	0.1062	0.1000	106		90 - 110	M	9/26/2019	03:37	A092619D 0
	Nickel	0.1060	0.1000	106		90 - 110	M	9/26/2019	03:37	A092619D 0
	Potassium	1.0438	1.0000	104		90 - 110	M	9/26/2019	03:37	A092619D 0
	Silver	0.1000	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Sodium	1.0114	1.0000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Thallium	0.0978	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Vanadium	0.1019	0.1000	102		90 - 110	M	9/26/2019	03:37	A092619D 0

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Aluminum	0.0944	0.1000	94		90 - 110	M	9/26/2019	04:36	A092619D 0
	Antimony	0.0949	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Barium	0.0970	0.1000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Beryllium	0.0948	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Cadmium	0.0958	0.1000	96		90 - 110	M	9/26/2019	04:36	A092619D 0
	Calcium	0.9715	1.0000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Chromium	0.0978	0.1000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Cobalt	0.0929	0.1000	93		90 - 110	M	9/26/2019	04:36	A092619D 0
	Lead	0.0991	0.1000	99		90 - 110	M	9/26/2019	04:36	A092619D 0
	Magnesium	1.0281	1.0000	103		90 - 110	M	9/26/2019	04:36	A092619D 0
	Manganese	0.1016	0.1000	102		90 - 110	M	9/26/2019	04:36	A092619D 0
	Nickel	0.0977	0.1000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Potassium	1.0167	1.0000	102		90 - 110	M	9/26/2019	04:36	A092619D 0
	Silver	0.0972	0.1000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Sodium	0.9842	1.0000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Thallium	0.0952	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Vanadium	0.0964	0.1000	96		90 - 110	M	9/26/2019	04:36	A092619D 0

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Aluminum	0.0992	0.1000	99		90 - 110	M	9/26/2019	05:27	A092619D 0
	Antimony	0.1009	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Barium	0.1013	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Beryllium	0.1021	0.1000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Cadmium	0.1007	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Calcium	1.0175	1.0000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Chromium	0.1012	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Cobalt	0.0960	0.1000	96		90 - 110	M	9/26/2019	05:27	A092619D 0
	Lead	0.1021	0.1000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Magnesium	1.0438	1.0000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Manganese	0.1042	0.1000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Nickel	0.1036	0.1000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Potassium	1.0401	1.0000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Silver	0.1004	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
	Sodium	1.0210	1.0000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Thallium	0.0998	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
	Vanadium	0.1003	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
ICV										
	Arsenic	0.1044	0.1000	104		90 - 110	M	9/27/2019	00:05	A092719 23
	Barium	0.0959	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Copper	0.0960	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Iron	0.9528	1.0000	95		90 - 110	M	9/27/2019	00:05	A092719 23
	Selenium	0.1021	0.1000	102		90 - 110	M	9/27/2019	00:05	A092719 23
	Zinc	0.0938	0.1000	94		90 - 110	M	9/27/2019	00:05	A092719 23
LLICV										
	Arsenic	0.0030	0.0030	100		80 - 120	M	9/27/2019	00:15	A092719 23
	Barium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Copper	0.0047	0.0050	94		80 - 120	M	9/27/2019	00:15	A092719 23
	Iron	0.0428	0.0500	86		80 - 120	M	9/27/2019	00:15	A092719 23
	Selenium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Zinc	0.0053	0.0050	106		80 - 120	M	9/27/2019	00:15	A092719 23

6020 3015 DOD

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	03:22	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	03:22	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	03:22	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Thallium	0.0010	U	0.00066	0.0003	0.0010	M	9/26/2019	03:22	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030

6020 3015 DOD

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	04:39	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	04:39	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	04:39	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Thallium	0.0005	J	0.00066	0.0003	0.0010	M	9/26/2019	04:39	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	05:19	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	05:19	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	05:19	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Thallium	0.0003	J	0.00066	0.0003	0.0010	M	9/26/2019	05:19	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
ICB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	00:11	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	00:11	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
CCB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	01:40	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	01:40	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-030

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/26/2019

Sample No.	Client ID	Time	Internal Standards %RI For:													
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
BLK	ZZZZZZ	0306												
BLK	BLK	0309	100		100		100		100		100		100	
STANDARD 5	STANDARD 5	0312	109		108		107		113		112		110	
ICV	ZZZZZZ	0316												
ICB1	ZZZZZZ	0319												
ICB2	ICB	0322	98		100		99		105		105		99	
LLICV	LLICV	0325	100		102		100		103		105		101	
ICV	ZZZZZZ	0333												
ICV	ICV	0337	106		106		100		104		109		106	
ICS-A1	ZZZZZZ	0340												
ICS-AB1	ICSAB	0343	96		101		108		112		116		105	
CHECK	ZZZZZZ	0347												
CHECK	ZZZZZZ	0350												
ICS-A2	ICSA	0353	97		103		117		119		123	*	107	
CHECK	ZZZZZZ	0356												
3017605	MB for HBN 54419	0403	103		104		104		106		110		104	
3017606	LCS for HBN 5441	0406	110		113		109		114		115		113	
3058771002	ZZZZZZ	0409												
3058771003	ZZZZZZ	0413												
3058771003S	ZZZZZZ	0416												
3058771003S	ZZZZZZ	0419												
3058771004	ZZZZZZ	0422												
3058771005	ZZZZZZ	0426												
3058771006	ZZZZZZ	0429												
3058771007	ZZZZZZ	0432												
CCV1	CCV	0436	113		114		112		112		119		115	
CCB1	CCB	0439	106		108		106		105		110		108	
3017605	ZZZZZZ	0443												
3059231002	03DUP01-20190918	0446	109		112		116		106		112		116	
3059231003	03MW04SI-2019091	0450	104		106		108		116		113		107	
3059231004	03MW04S-20190918	0453	104		106		109		108		111		107	
3059231005	03MW07S-20190918	0456	101		105		107		108		101		107	
3059231006	03MW09IS-2019091	0500	105		107		108		109		112		108	
3059231007	03RB01-20190918	0503	104		106		105		106		106		107	
3059275002	ZZZZZZ	0506												
3059275003	ZZZZZZ	0510												
3059275004	ZZZZZZ	0513												
CCV2	ZZZZZZ	0516												
CCB2	CCB	0519	105		108		110		101		99		108	
CCV3	ZZZZZZ	0524												
CCV4	CCV	0527	106		105		103		108		123	*	107	
3059275005	ZZZZZZ	0530												
3053278004	ZZZZZZ	0534												
3053278005	ZZZZZZ	0537												

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-030

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/26/2019

Sample No.	Client ID	Time	Internal Standards %RI For:											
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
3053278006	ZZZZZZ	0540												
3059836021	ZZZZZZ	0544												
LDR	ZZZZZZ	0550												
CHECK	ZZZZZZ	0555												
CCV5	ZZZZZZ	0558												
CCB3	ZZZZZZ	0601												

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-030

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092719 2355

Start Date: 9/26/2019 End Date: 9/27/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	2355																										
BLK	1.00	2358				X	X						X	X							X					X	
STANDARD 5	1.00	0002				X	X						X	X							X					X	
ICV	1.00	0005				X	X						X	X							X					X	
ZZZZZZ	1.00	0008																										
ICB	1.00	0011				X	X						X	X							X					X	
LLICV	1.00	0015				X	X						X	X							X					X	
ICSA	1.00	0028				X	X						X	X							X					X	
ICSAB	1.00	0031				X	X						X	X							X					X	
ZZZZZZ	1.00	0034																										
ZZZZZZ	1.00	0046																										
ZZZZZZ	1.00	0049																										
ZZZZZZ	1.00	0058																										
MB for HBN 544196 [	1.00	0104				X							X	X							X							
LCS for HBN 544196 [	1.00	0107				X							X	X							X					X	
ZZZZZZ	1.00	0111																										
ZZZZZZ	1.00	0114																										
ZZZZZZ	1.00	0117																										
ZZZZZZ	1.00	0120																										
ZZZZZZ	1.00	0124																										
ZZZZZZ	1.00	0127																										
ZZZZZZ	1.00	0130																										
ZZZZZZ	1.00	0133																										
CCV	1.00	0137				X	X						X	X							X					X	
CCB	1.00	0140				X	X						X	X							X					X	
03DUP01-20190918	1.00	0148				X	X						X	X							X					X	
03MW04SI-20190918	1.00	0151				X	X						X	X							X					X	
03MW04S-20190918	1.00	0155				X	X						X	X							X					X	
03MW07S-20190918	1.00	0158				X	X						X	X							X					X	
03MW09IS-20190918	1.00	0201				X							X	X							X					X	
03RB01-20190918	1.00	0205				X							X	X							X					X	
ZZZZZZ	1.00	0208																										
ZZZZZZ	1.00	0211																										
ZZZZZZ	1.00	0214																										
ZZZZZZ	1.00	0218																										
CCV	1.00	0221				X	X						X	X							X					X	

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-030

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092719 2355

Start Date: 9/26/2019 End Date: 9/27/2019

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCB	1.00	0224				X	X						X	X							X					X	
ZZZZZZ	1.00	0228																									
ZZZZZZ	1.00	0231																									
ZZZZZZ	1.00	0236																									
ZZZZZZ	1.00	0239																									
ZZZZZZ	1.00	0245																									
ZZZZZZ	10.00	0251																									
MB for HBN 544196 [	1.00	0254																							X	
CCV	1.00	0258																							X	
CCB	1.00	0301																							X	

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Aluminum	0.0992	0.1000	99		90 - 110	M	9/26/2019	05:27	A092619D 0
	Antimony	0.1009	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Barium	0.1013	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Beryllium	0.1021	0.1000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Cadmium	0.1007	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Calcium	1.0175	1.0000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Chromium	0.1012	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Cobalt	0.0960	0.1000	96		90 - 110	M	9/26/2019	05:27	A092619D 0
	Lead	0.1021	0.1000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Magnesium	1.0438	1.0000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Manganese	0.1042	0.1000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Nickel	0.1036	0.1000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Potassium	1.0401	1.0000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Silver	0.1004	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
	Sodium	1.0210	1.0000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Thallium	0.0998	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
	Vanadium	0.1003	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
ICV										
	Arsenic	0.1044	0.1000	104		90 - 110	M	9/27/2019	00:05	A092719 23
	Barium	0.0959	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Copper	0.0960	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Iron	0.9528	1.0000	95		90 - 110	M	9/27/2019	00:05	A092719 23
	Selenium	0.1021	0.1000	102		90 - 110	M	9/27/2019	00:05	A092719 23
	Zinc	0.0938	0.1000	94		90 - 110	M	9/27/2019	00:05	A092719 23
LLICV										
	Arsenic	0.0030	0.0030	100		80 - 120	M	9/27/2019	00:15	A092719 23
	Barium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Copper	0.0047	0.0050	94		80 - 120	M	9/27/2019	00:15	A092719 23
	Iron	0.0428	0.0500	86		80 - 120	M	9/27/2019	00:15	A092719 23
	Selenium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Zinc	0.0053	0.0050	106		80 - 120	M	9/27/2019	00:15	A092719 23

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Arsenic	0.1037	0.1000	104		90 - 110	M	9/27/2019	01:37	A092719 23
	Barium	0.0957	0.1000	96		90 - 110	M	9/27/2019	01:37	A092719 23
	Copper	0.0944	0.1000	94		90 - 110	M	9/27/2019	01:37	A092719 23
	Iron	0.9482	1.0000	95		90 - 110	M	9/27/2019	01:37	A092719 23
	Selenium	0.1003	0.1000	100		90 - 110	M	9/27/2019	01:37	A092719 23
	Zinc	0.0950	0.1000	95		90 - 110	M	9/27/2019	01:37	A092719 23
CCV										
	Arsenic	0.1049	0.1000	105		90 - 110	M	9/27/2019	02:21	A092719 23
	Barium	0.0976	0.1000	98		90 - 110	M	9/27/2019	02:21	A092719 23
	Copper	0.0979	0.1000	98		90 - 110	M	9/27/2019	02:21	A092719 23
	Iron	0.9465	1.0000	95		90 - 110	M	9/27/2019	02:21	A092719 23
	Selenium	0.1006	0.1000	101		90 - 110	M	9/27/2019	02:21	A092719 23
	Zinc	0.0977	0.1000	98		90 - 110	M	9/27/2019	02:21	A092719 23
CCV										
	Zinc	0.0970	0.1000	97		90 - 110	M	9/27/2019	02:58	A092719 23

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	05:19	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	05:19	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	05:19	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Thallium	0.0003	J	0.00066	0.0003	0.0010	M	9/26/2019	05:19	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
ICB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	00:11	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	00:11	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
CCB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	01:40	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	01:40	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	02:24	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	02:24	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
CCB										
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	03:01	A092719 2355 (

6020 3015 DOD

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-030

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/27/2019

Sample No.	Client ID	Time	Internal Standards %RI For: Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
BLK	ZZZZZZ	2355												
BLK	BLK	2358	100		100		100		100		100		100	
STANDARD 5	STANDARD 5	0002	104		101		99		108		101		104	
ICV	ICV	0005	108		108		104		107		102		110	
ICB1	ZZZZZZ	0008												
ICB2	ICB	0011	98		98		101		100		98		100	
LLICV	LLICV	0015	103		102		103		104		99		103	
ICS-A1	ICSA	0028	92		97		113		115		111		100	
ICS-AB1	ICSAB	0031	96		100		110		112		107		106	
CHECK	ZZZZZZ	0034												
CHECK	ZZZZZZ	0046												
LDR	ZZZZZZ	0049												
CHECK	ZZZZZZ	0058												
3017605	MB for HBN 54419	0104	103		103		103		105		102		105	
3017606	LCS for HBN 5441	0107	109		110		106		110		104		112	
3058771002	ZZZZZZ	0111												
3058771003	ZZZZZZ	0114												
3058771003S	ZZZZZZ	0117												
3058771003S	ZZZZZZ	0120												
3058771004	ZZZZZZ	0124												
3058771005	ZZZZZZ	0127												
3058771006	ZZZZZZ	0130												
3058771007	ZZZZZZ	0133												
CCV1	CCV	0137	115		116		111		112		106		119	
CCB1	CCB	0140	104		104		104		106		103		106	
3059231002	03DUP01-20190918	0148	102		102		106		105		101		104	
3059231003	03MW04SI-2019091	0151	101		103		105		112		101		104	
3059231004	03MW04S-20190918	0155	96		95		98		102		104		98	
3059231005	03MW07S-20190918	0158	97		101		105		107		105		105	
3059231006	03MW09IS-2019091	0201	102		103		105		107		99		105	
3059231007	03RB01-20190918	0205	103		103		102		107		101		103	
3059275002	ZZZZZZ	0208												
3059275003	ZZZZZZ	0211												
3059275004	ZZZZZZ	0214												
3059275005	ZZZZZZ	0218												
CCV2	CCV	0221	108		107		102		106		103		109	
CCB2	CCB	0224	101		101		98		102		98		103	
3017605	ZZZZZZ	0228												
3053278004	ZZZZZZ	0231												
3053278005	ZZZZZZ	0236												
3053278006	ZZZZZZ	0239												
3059836032	ZZZZZZ	0245												
3059836032	ZZZZZZ	0251												
3017605	MB for HBN 54419	0254	96		97		98		101		97		97	

6020 3015 DOD

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-030

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/27/2019

Sample No.	Client ID	Time	Internal Standards %RI For:											
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
CCV3	CCV	0258	105		104		101		105		100		107	
CCB3	CCB	0301	100		100		99		102		98		104	

6020 3015 DOD

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INTERFERENCE CHECK SAMPLE

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

ICS Source: Inorganic Ventures **Instrument ID:** AGILENT 7700 ICPMS

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	Analysis Date	Analysis Time	Run Number
ICSAB									
	Aluminum	88.1	100.0000	88		80 - 120%	9/26/2019	03:43	A092619D 03
	Antimony	0.0005				-0.00200 - -0.00200	9/26/2019	03:43	A092619D 03
	Barium	0.0007				-0.00500 - -0.00500	9/26/2019	03:43	A092619D 03
	Beryllium	0.00000				-0.001000 - -0.001000	9/26/2019	03:43	A092619D 03
	Cadmium	0.0102	0.01000	102		80 - 120%	9/26/2019	03:43	A092619D 03
	Calcium	91.0	100.0000	91		80 - 120%	9/26/2019	03:43	A092619D 03
	Chromium	0.0190	0.02000	95		80 - 120%	9/26/2019	03:43	A092619D 03
	Cobalt	0.0349	0.04000	87		80 - 120%	9/26/2019	03:43	A092619D 03
	Lead	0.0001				-0.00200 - -0.00200	9/26/2019	03:43	A092619D 03
	Magnesium	98.5871	100.00000	99		80 - 120%	9/26/2019	03:43	A092619D 03
	Manganese	0.0201	0.02000	100		80 - 120%	9/26/2019	03:43	A092619D 03
	Nickel	0.0367	0.04000	92		80 - 120%	9/26/2019	03:43	A092619D 03
	Potassium	99.1147	100.00000	99		80 - 120%	9/26/2019	03:43	A092619D 03
	Silver	0.0189	0.02000	94		80 - 120%	9/26/2019	03:43	A092619D 03
	Sodium	95.8801	100.00000	96		80 - 120%	9/26/2019	03:43	A092619D 03
	Thallium	0.00005				-0.001000 - -0.001000	9/26/2019	03:43	A092619D 03
	Vanadium	0.0382	0.04000	96		80 - 120%	9/26/2019	03:43	A092619D 03

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INTERFERENCE CHECK SAMPLE

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

ICS Source: Inorganic Ventures **Instrument ID:** AGILENT 7700 ICPMS

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	Analysis Date	Analysis Time	Run Number
ICSA									
	Aluminum	83.7	100.0000	84		80 - 120%	9/26/2019	03:53	A092619D 03
	Antimony	0.0002				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Barium	0.0005				-0.02000 - -0.02000	9/26/2019	03:53	A092619D 03
	Beryllium	0.00000				-0.002000 - -0.002000	9/26/2019	03:53	A092619D 03
	Cadmium	0.0010				-0.00200 - -0.00200	9/26/2019	03:53	A092619D 03
	Calcium	85.7	100.0000	86		80 - 120%	9/26/2019	03:53	A092619D 03
	Chromium	0.0000				-0.00800 - -0.00800	9/26/2019	03:53	A092619D 03
	Cobalt	0.0006				-0.01200 - -0.01200	9/26/2019	03:53	A092619D 03
	Lead	0.0001				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Magnesium	95.9195	100.00000	96		80 - 120%	9/26/2019	03:53	A092619D 03
	Manganese	0.0012				-0.02000 - -0.02000	9/26/2019	03:53	A092619D 03
	Nickel	0.0012				-0.01000 - -0.01000	9/26/2019	03:53	A092619D 03
	Potassium	97.9671	100.00000	98		80 - 120%	9/26/2019	03:53	A092619D 03
	Silver	0.0000				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Sodium	93.6543	100.00000	94		80 - 120%	9/26/2019	03:53	A092619D 03
	Thallium	0.00001				-0.002000 - -0.002000	9/26/2019	03:53	A092619D 03
	Vanadium	-0.0001				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
ICSA									
	Arsenic	0.0002				-0.00600 - -0.00600	9/27/2019	00:28	A092719 2355
	Barium	0.0005				-0.02000 - -0.02000	9/27/2019	00:28	A092719 2355
	Copper	0.0012				-0.01000 - -0.01000	9/27/2019	00:28	A092719 2355
	Iron	85.4397	100.00000	85		80 - 120%	9/27/2019	00:28	A092719 2355
	Selenium	0.0003				-0.01000 - -0.01000	9/27/2019	00:28	A092719 2355
	Zinc	0.0017				-0.02000 - -0.02000	9/27/2019	00:28	A092719 2355
ICSAB									
	Arsenic	0.0196	0.02000	98		80 - 120%	9/27/2019	00:31	A092719 2355
	Barium	0.0007				-0.00500 - -0.00500	9/27/2019	00:31	A092719 2355
	Copper	0.0175	0.02000	88		80 - 120%	9/27/2019	00:31	A092719 2355
	Iron	96.1664	100.00000	96		80 - 120%	9/27/2019	00:31	A092719 2355
	Selenium	0.0226	0.02000	113		80 - 120%	9/27/2019	00:31	A092719 2355
	Zinc	0.0188	0.02000	94		80 - 120%	9/27/2019	00:31	A092719 2355

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PREPARATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result (mg/L)	Conc Qual	Q	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
3017605			**QC-WATER**								
	Aluminum	0.0889	U		0.044	0.0300	0.0889	M	9/26/2019	04:03	A092619D 0306
	Antimony	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Arsenic	0.00333	U		0.0017	0.00100	0.00333	M	9/27/2019	01:04	A092719 2355 (
	Barium	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 0306
	Beryllium	0.001111	U		0.0006	0.000300	0.001111	M	9/26/2019	04:03	A092619D 0306
	Cadmium	0.00111	U		0.0006	0.00037	0.00111	M	9/26/2019	04:03	A092619D 0306
	Calcium	0.1111	U		0.056	0.0370	0.1111	M	9/26/2019	04:03	A092619D 0306
	Chromium	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Cobalt	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 0306
	Copper	0.00282	J		0.0028	0.00185	0.00556	M	9/27/2019	01:04	A092719 2355 (
	Iron	0.05556	U		0.028	0.01900	0.05556	M	9/27/2019	01:04	A092719 2355 (
	Lead	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Magnesium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 0306
	Manganese	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 0306
	Nickel	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 0306
	Potassium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 0306
	Selenium	0.00556	U		0.0028	0.00190	0.00556	M	9/27/2019	01:04	A092719 2355 (
	Silver	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Sodium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 0306
	Thallium	0.00111	U		0.0006	0.00030	0.00111	M	9/26/2019	04:03	A092619D 0306
	Vanadium	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 0306
	Zinc	0.00308	J		0.0028	0.00185	0.00556	M	9/27/2019	02:54	A092719 2355 (

6020 3015 DOD

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Aqueous LCS Source: Inorganic Ventures **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Q	QC Criteria	M
3017606									
	Aluminum	mg/L	2.2220	2.0996		94		84 - 117	M
	Antimony	mg/L	0.2220	0.2183		98		85 - 117	M
	Arsenic	mg/L	0.2220	0.2333		105		84 - 116	M
	Barium	mg/L	2.2220	2.2180		100		86 - 114	M
	Beryllium	mg/L	0.2220	0.2205		99		83 - 121	M
	Cadmium	mg/L	0.2220	0.2194		99		87 - 115	M
	Calcium	mg/L	2.2220	2.2558		102		87 - 118	M
	Chromium	mg/L	0.2220	0.2230		100		85 - 116	M
	Cobalt	mg/L	0.2220	0.2189		99		86 - 115	M
	Copper	mg/L	0.2220	0.2192		99		85 - 118	M
	Iron	mg/L	2.2220	2.2637		102		87 - 118	M
	Lead	mg/L	0.2220	0.2284		103		88 - 115	M
	Magnesium	mg/L	2.2220	2.2413		101		83 - 118	M
	Manganese	mg/L	0.2220	0.2275		102		87 - 115	M
	Nickel	mg/L	0.2220	0.2283		103		85 - 117	M
	Potassium	mg/L	2.2220	2.2851		103		87 - 115	M
	Selenium	mg/L	0.2220	0.2229		100		80 - 120	M
	Silver	mg/L	0.1110	0.1083		98		85 - 116	M
	Sodium	mg/L	2.2220	2.2898		103		85 - 117	M
	Thallium	mg/L	0.2220	0.2294		103		82 - 116	M
	Vanadium	mg/L	0.2220	0.2237		101		86 - 115	M
	Zinc	mg/L	0.2220	0.2153		97		83 - 119	M

6020 3015 DOD

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SAMPLE PREPARATION SUMMARY

Client: Earth Toxics Inc.

SDG No.: EPR-030

Contract: EPR030|Willow Grove Sites **Lab Code:** ALS

3 &

Method: MS

Case No.: WE04 **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	544196						
3017605	MB for HBN 544196 [MDIG/8007	MB	QC-WAT	9/25/19	45.0	50.0	
3017606	LCS for HBN 544196 [MDIG/8007	LCS	QC-WAT	9/25/19	45.0	50.0	
3059231002	03DUP01-20190918	SAM	WATER	9/25/19	45.0	50.0	
3059231003	03MW04SI-20190918	SAM	WATER	9/25/19	45.0	50.0	
3059231004	03MW04S-20190918	SAM	WATER	9/25/19	45.0	50.0	
3059231005	03MW07S-20190918	SAM	WATER	9/25/19	45.0	50.0	
3059231006	03MW09IS-20190918	SAM	WATER	9/25/19	45.0	50.0	
3059231007	03RB01-20190918	SAM	WATER	9/25/19	45.0	50.0	

Microwave 3015 Prep (Water) (Version 2- 11/12/2015)

Note: All TCLP matrix spikes are spiked prior to preservation as noted in the TCLP logbook.

Batch: 80070	**Queue:** MDIG	**HBN:** 544196	**RULE:** D3015/6020	**ALSI SOP:** 09-3015	
File Name: 80070_190925-200808			**METHOD:** 3015	**Microwave ID:** MWV-1	

Batch Type:	**Comment Codes:**	**Reagents:**		**Pipettes:**		**Start**	**Finish**
T: TCLP	1. Sample failed initial digestion due to a weight loss >5g	HNO3:	190124005	03-345	**Date:**	09/25/2019	09/25/2019
S: SPLP	2. Sample reacts with reagent	HCL:	180920001	03-306	**Time:**	20:15:00	20:45:00
M: 6020	3. Less sample used due to high metal content	Balance ID:	BAL-11	03-309	**Tech:**	SXC	SXC
W: 6010	4. Less sample used to result in successful microwave digestion				**Reviewed/Approved By:**		
A: ASTM	5. Sample does not digest by microwave, digest by method 3050				**Date:**		

Sample ID	Cont ID	Samp Type	Vessel Initial WT, grams	Vessel Final WT, grams	Difference grams	Spike Amt uL of Each	Spike Lot#	Sample Size, mL	Final Vol mL	Batch Type	Parent Sample ID	Comment Code
3017605		MB	210.316	210.289	0.027			45	50	M		
3017606		LCS	212.242	212.218	0.024	40/50/50/50/50	010/190125008/190	45	50	M		
3058771002	C	S	209.851	209.755	0.096			45	50	M		
3058771003	G	S	211.393	211.364	0.029			45	50	M		
3017608		MS	212.050	211.994	0.056	40/50/50/50/50	010/190125008/190	45	50	M	3058771003	
3017609		MSD	212.257	212.197	0.060	40/50/50/50/50	010/190125008/190	45	50	M	3058771003	
3058771004	C	S	210.415	210.322	0.093			45	50	M		
3058771005	C	S	212.189	212.117	0.072			45	50	M		
3058771006	C	S	210.425	210.389	0.036			45	50	M		
3058771007	C	S	211.901	211.821	0.080			45	50	M		
3059231002	C	S	212.525	212.483	0.042			45	50	M		
3059231003	C	S	210.563	210.500	0.063			45	50	M		
3059231004	C	S	213.186	213.160	0.026			45	50	M		
3059231005	C	S	213.609	213.547	0.062			45	50	M		
3059231006	C	S	210.148	210.097	0.051			45	50	M		
3059231007	C	S	211.586	211.523	0.063			45	50	M		
3059275002	C	S	211.634	211.575	0.059			45	50	M		
3059275003	C	S	212.550	212.487	0.063			45	50	M		
3059275004	C	S	212.239	212.197	0.042			45	50	M		
3059275005	C	S	212.987	212.916	0.071			45	50	M		
3053278004	A	S	210.156	210.113	0.043			45	50	M		
3053278005	A	S	211.520	211.487	0.033			45	50	M		
3053278006	A	S	210.897	210.833	0.064			45	50	M		
3059836032	A	S	211.551	211.519	0.032			45	50	M		

End

Total Mercury by Method 7470 Summary Forms

7470 DOD
- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc.

SDG No.: EPR-030 **Method Type:** 7470 DOD **SOW No.:**

Contract: EPR030|Willow Grove **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
3059231002	03DUP01-20190918	
3059231003	03MW04SI-20190918	
3059231004	03MW04S-20190918	
3059231005	03MW07S-20190918	
3059231006	03MW09IS-20190918	
3059231007	03RB01-20190918	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **Matthew Olley**

Date: Title: **Metals Supervisor**

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR030|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-030

Instrument ID Number: Cetac Hg Method: CV Run Number: 092619W

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																						
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
Calibration Blank	1.00	1436																X								
Standard #1 (0.2 ug	1.00	1438																X								
Standard #2 (1 ug/L	1.00	1439																X								
Standard #3 (2 ug/L	1.00	1440																X								
Standard #4 (4 ug/L	1.00	1441																X								
Standard #5 (10 ug/	1.00	1443																X								
ICV	1.00	1445																X								
ICB	1.00	1446																X								
ZZZZZZ	1.00	1448																								
MB for HBN 544296 [	1.00	1449																X								
LCS for HBN 544296 [	1.00	1450																X								
LCS for HBN 544296 [	1.00	1451																X								
03DUP01-20190918	1.00	1452																X								
03MW04SI-20190918	1.00	1454																X								
03MW04S-20190918	1.00	1455																X								
03MW07S-20190918	1.00	1456																X								
03MW09IS-20190918	1.00	1457																X								
03RB01-20190918	1.00	1458																X								
CCV	1.00	1500																X								
CCB	1.00	1501																X								
ZZZZZZ	1.00	1502																								
ZZZZZZ	1.00	1503																								
ZZZZZZ	1.00	1504																								
ZZZZZZ	1.00	1506																								
ZZZZZZ	1.00	1507																								
ZZZZZZ	1.00	1508																								
ZZZZZZ	1.00	1509																								
ZZZZZZ	1.00	1510																								
ZZZZZZ	1.00	1512																								
ZZZZZZ	1.00	1513																								
ZZZZZZ	1.00	1514																								
ZZZZZZ	1.00	1515																								
ZZZZZZ	1.00	1517																								
ZZZZZZ	1.00	1518																								
ZZZZZZ	1.00	1519																								
ZZZZZZ	1.00	1520																								

7470 DOD

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: CAS MIXED

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
ICV	Mercury	0.0041	0.004	102		90 - 110	CV	9/26/2019	14:45	092619W
CCV	Mercury	0.0042	0.004	105		90 - 110	CV	9/26/2019	15:00	092619W

7470 DOD

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB	Mercury	0.00050	U	0.00035	0.00016	0.00050	CV	9/26/2019	14:46	092619W
CCB	Mercury	0.00050	U	0.00035	0.00016	0.00050	CV	9/26/2019	15:01	092619W

7470 DOD
- 3b -
PREPARATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result (mg/L)	Conc Qual	Q	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
3017954			**QC-WATER**								
	Mercury	0.000500	U		0.0003	0.000160	0.000500	CV	9/26/2019	14:49	092619W

7470 DOD

- 7 -

LABORATORY CONTROL SAMPLE SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Aqueous LCS Source: CAS MIXED **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Q	QC Criteria	M
3017955									
	Mercury	mg/L	0.0020	0.0019		95		82 - 119	CV

7470 DOD

- 7 -

LABORATORY CONTROL SAMPLE SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Aqueous LCS Source: CAS MIXED **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Q	QC Criteria	M
3017956									
	Mercury	mg/L	0.0020	0.0018		90		82 - 119	CV

7470 DOD
- 13 -
SAMPLE PREPARATION SUMMARY

Client: Earth Toxics Inc.

SDG No.: EPR-030

Contract: EPR030|Willow Grove Sites 3 & **Lab Code:** ALS

Method: CV

Case No.: WE04 **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	544296						
3017954	MB for HBN 544296 [MDIG/8008	MB	QC-WAT	9/26/19	5.0	5.0	
3017955	LCS for HBN 544296 [MDIG/8008	LCS	QC-WAT	9/26/19	5.0	5.0	
3017956	LCS for HBN 544296 [MDIG/8008	LCS	QC-WAT	9/26/19	5.0	5.0	
3059231002	03DUP01-20190918	SAM	WATER	9/26/19	5.0	5.0	
3059231003	03MW04SI-20190918	SAM	WATER	9/26/19	5.0	5.0	
3059231004	03MW04S-20190918	SAM	WATER	9/26/19	5.0	5.0	
3059231005	03MW07S-20190918	SAM	WATER	9/26/19	5.0	5.0	
3059231006	03MW09IS-20190918	SAM	WATER	9/26/19	5.0	5.0	
3059231007	03RB01-20190918	SAM	WATER	9/26/19	5.0	5.0	

ANALYTE	ORIGINAL 03MW04SI-20190918	DUPLICATE 03DUP01-20190918	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
ACETONE	5.6	5.3	5	5.5	FALSE	FALSE	FALSE	FALSE
TETRACHLOROETHENE	3.7	3.4	1	8.5	FALSE	TRUE	TRUE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
BARIUM	0.3	0.3	0.005	0.0	FALSE	TRUE	TRUE	FALSE
CALCIUM	32.4	30.3	0.11	6.7	FALSE	TRUE	TRUE	TRUE
CHROMIUM	0.0028	0.0045	0.002	46.6	TRUE	FALSE	TRUE	FALSE
COPPER	0.0037	0.012	0.005	105.7	TRUE	FALSE	TRUE	FALSE
MAGNESIUM	8.4	9.4	0.11	11.2	FALSE	TRUE	TRUE	TRUE
NICKEL	0.0037	0.0023	0.005	46.7	TRUE	FALSE	FALSE	FALSE
POTASSIUM	0.71	0.86	0.11	19.1	FALSE	TRUE	TRUE	FALSE
SELENIUM	0.0022	0.0037	0.005	50.8	TRUE	FALSE	FALSE	FALSE
SODIUM	15.8	17.5	0.11	10.2	FALSE	TRUE	TRUE	TRUE
ZINC	0.003	0.0073	0.005	83.5	TRUE	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!			

VOC CALCULATION	SAMPLE 03DUP01-20190918			
TARGET ANALYTE	tetrachloroethene			
ANALYTE RESPONSE	41688			
INTERNAL STANDARD	chlorobenzene-d5			
I.S. RESPONSE	766980			
I.S. CONCENTRATION	30	µg/l		
ANALYTE CAL. RF	0.47429			
DILUTION FACTOR (DF)	1			
INITIAL SAMPLE VOLUME - V1	5	ml		
FINAL SAMPLE VOLUME - V2	5	ml		
ON COLUMN AMOUNT	3.437987613	µg/l		
(ANALYTE RESPONSE) x (I.S. CONCENTRATION) X DF x V2	=	**3.44**	**µg/l**	
(I.S. RESPONSE) x (CAL. R.F.) x V1	=	**0.00343799**	**mg/l**	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03DUP01-20190918

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-030

Matrix (soil/water): WATER Lab Sample ID: 3059231002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092575.D

Level (low/med): Date Received: 9/19/19

% Moisture: not dec. 100.0 Date Analyzed: 9/26/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	3.4	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

ALS Environmental Services

VOLATILE REPORT SW-846 Method 8260

Data file : \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190925A.b\719092575
Lab Smp Id: 3059231002 Client Smp ID: 03DUP01-20190918
Inj Date : 26-SEP-2019 04:59
Operator : PDK Inst ID: ms07.i
Smp Info : 3059231002;;1;;;;;
Misc Info : ZZ VOMS 52440 D8260W
Comment :
Method : \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190925A.b\7-8260b09
Meth Date : 28-Sep-2019 08:15 carl Quant Type: ISTD
Cal Date : 25-SEP-2019 22:35 Cal File: 719092558.D
Als bottle: 25
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: DODall.sub
Target Version: 4.14
Processing Host: ALMDTW7047

Concentration Formula: Amt * DF * Uf * 5/Vo * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged
DF	1.000	sample dilution factor
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/L)	REVIEW CODE
1 Dichlorodifluoromethane	85	Compound Not Detected.						
2 Chloromethane	50	Compound Not Detected.						
3 Vinyl Chloride	62	Compound Not Detected.						
4 Bromomethane	94	Compound Not Detected.						
5 Chloroethane	64	Compound Not Detected.						
6 Pentane	41	Compound Not Detected.						
7 Trichlorofluoromethane	101	Compound Not Detected.						
8 Dichlorofluoromethane	67	Compound Not Detected.						
9 Ethyl Ether	74	Compound Not Detected.						
10 1,1-Dichloroethene	61	Compound Not Detected.						
12 Carbon Disulfide	76	Compound Not Detected.						
11 Freon 113	101	Compound Not Detected.						
13 Iodomethane	127	Compound Not Detected.						
14 Acrolein	56	Compound Not Detected.						
16 3-Chloro-1-propene	41	Compound Not Detected.						
15 Isopropyl Alcohol	45	Compound Not Detected.						
17 Methylene Chloride	84	Compound Not Detected.						
18 Acetone	58	2.668	2.665	(0.657)	3524	5.32937	5.32937(a)	
19 Methyl acetate	74	Compound Not Detected.						
20 trans-1,2-Dichloroethene	61	Compound Not Detected.						
21 Hexane	57	Compound Not Detected.						

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/L)	REVIEW CODE
	74 Tetrachloroethene	164	5.294	5.294	(0.874)	41688	3.43799	3.43799	
	76 Ethyl methacrylate	69	Compound Not Detected.						
	77 1,1,2-Trichloroethane	83	Compound Not Detected.						
	78 Chlorodibromomethane	129	Compound Not Detected.						
	79 1,3-Dichloropropane	76	Compound Not Detected.						
	80 1,2-Dibromoethane	107	Compound Not Detected.						
	81 2-Hexanone	43	Compound Not Detected.						
	82 1-Chlorohexane	91	Compound Not Detected.						
*	83 Chlorobenzene-d5	82	6.056	6.055	(1.000)	766980	30.0000		
	85 Ethylbenzene	106	Compound Not Detected.						
	84 Chlorobenzene	112	Compound Not Detected.						
	86 1,1,1,2-Tetrachloroethane	131	Compound Not Detected.						
	87 mp-Xylene	106	Compound Not Detected.						
M	120 1,3-Dichloropropene, Total	75	Compound Not Detected.						
	88 o-Xylene	106	Compound Not Detected.						
	89 Styrene	104	Compound Not Detected.						
	90 Bromoform	173	Compound Not Detected.						
	91 Isopropylbenzene	105	Compound Not Detected.						
$	92 4-Bromofluorobenzene	174	6.944	6.945	(0.888)	347491	34.7207	34.7207(R)	
M	121 TOTAL XYLENES	106	Compound Not Detected.						
	94 n-Propylbenzene	120	Compound Not Detected.						
	93 Bromobenzene	156	Compound Not Detected.						
	95 1,1,2,2-Tetrachloroethane	83	Compound Not Detected.						
	97 1,3,5-Trimethylbenzene	105	Compound Not Detected.						
	96 o-Chlorotoluene	91	Compound Not Detected.						
	98 1,2,3-Trichloropropane	110	Compound Not Detected.						
	99 trans-1,4-Dichloro-2-butene	53	Compound Not Detected.						
	101 p-Chlorotoluene	91	Compound Not Detected.						
	102 tert-Butylbenzene	134	Compound Not Detected.						
	103 Pentachloroethane	117	Compound Not Detected.						
	104 1,2,4-Trimethylbenzene	105	Compound Not Detected.						
	105 sec-Butylbenzene	105	Compound Not Detected.						
	106 p-Isopropyltoluene	134	Compound Not Detected.						
	107 1,3-Dichlorobenzene	146	Compound Not Detected.						
*	108 1,4-Dichlorobenzene-d4	152	7.822	7.824	(1.000)	545066	30.0000		
	109 1,4-Dichlorobenzene	146	Compound Not Detected.						
	111 n-Butylbenzene	134	Compound Not Detected.						
	110 Benzyl Chloride	126	Compound Not Detected.						
	112 Hexachloroethane	117	Compound Not Detected.						
	113 1,2-Dichlorobenzene	146	Compound Not Detected.						
	114 1,2-Dibromo-3-chloropropane	75	Compound Not Detected.						
	115 Nitrobenzene	77	Compound Not Detected.						
	116 Hexachlorobutadiene	225	Compound Not Detected.						
	117 1,2,4-Trichlorobenzene	180	Compound Not Detected.						
	118 Naphthalene	128	Compound Not Detected.						
	119 1,2,3-Trichlorobenzene	180	Compound Not Detected.						

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-030

Instrument ID: ms07.i Calibration Date(s): 9/25/2019 9/25/2019

Heated Purge: (Y/N) N Calibration Time(s): 20:42 22:58

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092554.D RRF005 = 719092555.D RRF020 = 719092556.D RRF050 = 719092557.D

RRF100 = 719092558.D RRF200 = 719092559.D RRF00.5 = 719092553.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Iodomethane	1322383	249		Q	0.000000	0.064510	0.004370	0.99551
Isobutyl alcohol	182803	459		Q	0.000000	0.000730	0.000008	0.99217
Isopropyl Alcohol		361		Q	0.000000	0.002230	-0.000060	0.99819
Isopropylbenzene	2.35427	2.60241		A		2.576400		4.69555
p-Isopropyltoluene	0.54224	0.42228		A		0.514570		9.36138
Methyl acetate	0.03431	0.03733		A		0.032950		10.49648
Methyl acrylate	0.19736	0.17559		A		0.180580		8.94379
Methacrylonitrile	0.09056	0.09622		A		0.088550		6.78720
Methyl cyclohexane	0.91892	0.95331		A		0.895750		9.95149
Methyl methacrylate	0.18618	0.16826		A		0.165090		13.24116
Methyl t-Butyl Ether	0.54858	0.51947		A		0.517340		6.12188
4-Methyl-2-Pentanone(MIBK)	8869360	13603		Q	0.000000	0.248790	0.001250	0.99887
Methylene Chloride	2814861	9437		L	0.000000	5.048260		0.99986
Naphthalene	5487471	683		Q	0.000000	0.704010	0.056740	0.99857
Nitrobenzene	428299			Q	0.000000	-0.002080	0.000160	0.99610
2-Nitropropane	3447874	5405		Q	0.000000	0.097420	0.000470	0.99921
Octane	0.23140	0.21911		A		0.203940		14.77699
Pentachloroethane	0.36275	0.36448		A		0.366060		4.52175
Pentane	2708082	9008		Q	0.000000	0.208280	-0.002680	0.99986
n-Propanol	0.01113	0.01516		A		0.011840		12.50008
Propionitrile	1549366	4287		Q	0.000000	0.017610	0.000120	0.99447
n-Propylbenzene	0.67587	0.67469		A		0.692560		2.54349
Styrene	1.55889	1.59911		A		1.590120		4.30460
1,1,1,2-Tetrachloroethane	0.45161	0.45504		A		0.427700		6.27376
1,1,2,2-Tetrachloroethane *	0.63893	0.74063		A		0.672930		5.24785
Tetrachloroethene	0.46330	0.55251		A		0.474290		9.18633
Tetrahydrofuran	0.05338	0.05629		A		0.050920		9.59334
Toluene **	1.21456	1.31349		A		1.222220		3.85046
Total Xylenes	0.80875	0.82404		A		0.813960		3.62583
1,2,3-Trichlorobenzene	1978950	185		Q	0.000000	0.314430	0.011340	0.99902
1,2,4-Trichlorobenzene	2489280	95.00000		Q	0.000000	0.421820	0.010410	0.99922
1,1,1-Trichloroethane	0.31106	0.31881		A		0.290010		7.31166
1,1,2-Trichloroethane	0.36684	0.42046		A		0.367980		6.87792
Trichloroethene	0.22998	0.28809		A		0.236230		10.44862
Trichlorofluoromethane	4689266	15850		Q	0.000000	0.370020	-0.006080	0.99996
1,2,3-Trichloropropane	0.18557	0.21697		A		0.195070		6.18577

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

TETRA TECH

INTERNAL CORRESPONDENCE

TO: **T. MOORE** **DATE:** **DECEMBER 16, 2019**

FROM: **J. KALINYAK** **COPIES:** **DV FILE**

SUBJECT: **DATA VALIDATION – VOC, METALS**
WILLOW GROVE NAS JRB
SAMPLE DELIVERY GROUP (SDG) EPR-031

SAMPLES: **5 / Aqueous – VOC**

03DUP02-20190920	03MW03I-20190920	03MW03SI-20190920
03MW04I-20190920	03TB04-20190920	

4 **/ Aqueous – Metals**

03DUP02-20190920	03MW03I-20190920	03MW03SI-20190920
03MW04I-20190920		

Overview

The sample set for Willow Grove NAS JRB, SDG EPR-031, consisted of four (4) aqueous samples and one (1) aqueous Trip Blank (TB) sample. All aqueous samples were analyzed for Volatile Organic Compounds (VOCs). The four (4) aqueous samples were also analyzed for total metals including mercury, as listed above. One field duplicate sample pair was associated with this SDG: samples 03DUP02-20190920 / 03MW03SI-20190920.

The samples were collected by Tetra Tech on September 20, 2019 and analyzed by ALS Environmental for all analyses listed above. All analyses were conducted in accordance with EPA SW-846 Methods 8260C for VOCs, 6020A (ICP/MS) for total metals, and 7470A for mercury, analytical and reporting protocols.

The data contained in this SDG was validated at a EPA Stage Level 2B with regard to the following parameters: data completeness, holding times, initial & continuing calibration results, blank results, laboratory control sample (LCS)/LCS duplicate (LCSD), surrogate spike recoveries, internal standard recoveries, chromatographic resolution, ICP interference results, ICP serial dilution results, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

Major Problems

No major problems were identified.

Minor Problems

- Detected results reported below the quantitation limit but above the method detection limit (MDL) were qualified as estimated, (J).

- The initial calibration verification (ICV) percent differences (%Ds) were greater than the 20% QC limit for bromomethane, 2-butanone, 1,1-dichloroethene, trans-1,2-dichloroethene, 1,4-dioxane, and methyl acetate for instrument ms07 on 09/27/2019 @ 03:10 affecting all samples analyzed for VOCs. The LCS was used by the laboratory as the ICV. The aforementioned samples had non-detected results for bromomethane, 2-butanone, 1,1-dichloroethene, trans-1,2-dichloro-ethene, 1,4-dioxane, and methyl acetate that were qualified estimated, (UJ).

- The closing continuing calibration verification (CCV) %D was greater than the 50% QC limit for 1,4-dioxane for instrument ms07 on 09/27/2019 @ 22:07 affecting all samples analyzed for VOCs. The 1,4-dioxane aforementioned sample non-detected results were qualified estimated, (UJ).

- For the VOC fraction, the LCS had a percent recovery (%R) for 1,2,3-trichlorobenzene that was less than the QC limits affecting all VOC samples. The samples had non-detected results for 1,2,3-trichlorobenzene that were qualified estimated, (UJ).

- For the metals fraction, metals were detected in the continuing calibration blank (CCB) and method blank affecting all metal analysis samples at the following maximum concentrations listed below.

Analyte	Maximum Concentration	Limit of Quantitation (LOQ) > or <
Thallium (1)	0.0005 mg/l	<LOQ
Copper (2)	0.00282 mg/l	<LOQ
Zinc (2)	0.00308 mg/l	<LOQ

(1) Maximum concentration detected in a CCB on 09/26/3019 @ 04:39 affecting all metal analysis samples.
(2) Maximum concentration detected in method blank for batch 544196 affecting all metal analysis samples.

The sample 03DUP02-20190920 had a detected thallium result reported <LOQ. The sample 03DUP02-20190920 thallium result was qualified non-detected, (U). The remainder of the samples had non-detected thallium results which were not qualified. The samples 03MW03SI-20190920 and 03MW04I-20190920 had detected copper results reported <LOQ and were qualified as non-detected, (U). The samples 03DUP02-20190920 and 03MW03I-20190920 had non-detected copper results which were not qualified. All metal samples had zinc results <LOQ which were qualified non-detected, (U).

Notes

Non-detected sample analyte results were reported to the Limit of Detection (LOD).
For the VOC analysis, the method blank MB 3018649 had a detection for 1,4-dioxane @ 73.7 µg/l, >LOQ. No action was taken as all samples had non-detected 1,4-dioxane results.

For the VOC fraction, the LCS had a %R for 1,4-dioxane that was greater than the QC limits affecting all VOC samples. The aforementioned samples had non-detected results for 1,4-dioxane which were not qualified.

For the metals analysis, a CCV and an interference check had internal standard %Rs above the QC limit. No action was taken for this issue and it is noted for completeness only.

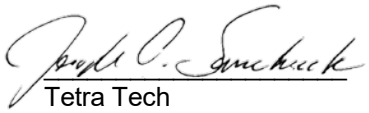
EXECUTIVE SUMMARY

Laboratory Performance Issues: VOC sample results were qualified for ICV & CCV %D and LCS %R results outside the QC limits. Sample thallium, copper, and zinc results were qualified non-detected for method blank contamination.

Other Factors Affecting Data Quality: Detected results reported below the quantitation limit but above the MDL were qualified as estimated, (J).

The data for these analyses were reviewed with reference to the USEPA National Functional Guidelines for Superfund Organic Methods Data Review (January 2017) and USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review (January 2017).

Tetra Tech
Joseph Kalinyak
Data Validator/Environmental Scientist



Tetra Tech
Joseph A. Samchuck
Data Validation Manager

Attachments:
Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = RPD between columns/detectors >40% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 standard deviations is greater than sample activity
Z1 = Tentatively Identified Compound considered presumptively present
Z2 = Tentatively Identified Compound column bleed
Z3 = Tentatively Identified Compound aldol condensate
Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

PROJ_NO: 08005-WE04	NSAMPLE	03DUP02-20190920			03MW03I-20190920			03MW03SI-20190920			03MW04I-20190920		
SDG: EPR-031	LAB_ID	3059275005			3059275003			3059275002			3059275004		
FRACTION: OV	SAMP_DATE	9/20/2019			9/20/2019			9/20/2019			9/20/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	03MW03SI-20190920											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1,2,2-TETRACHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,1-DICHLOROETHENE		0.75	UJ	C	0.75	UJ	C	0.75	UJ	C	0.75	UJ	C
1,2,3-TRICHLOROBENZENE		0.75	UJ	E	0.75	UJ	E	0.75	UJ	E	0.75	UJ	E
1,2,4-TRICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U		2.5	U		2.5	U		2.5	U	
1,2-DIBROMOETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,2-DICHLOROPROPANE		0.75	U		0.75	U		0.75	U		0.75	U	
1,3-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,4-DICHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
1,4-DIOXANE		62.5	UJ	C	62.5	UJ	C	62.5	UJ	C	62.5	UJ	C
2-BUTANONE		3.8	UJ	C	3.8	UJ	C	3.8	UJ	C	3.8	UJ	C
2-HEXANONE		3.8	U		3.8	U		3.8	U		3.8	U	
4-METHYL-2-PENTANONE		3.8	U		3.8	U		3.8	U		3.8	U	
ACETONE		3.8	U		3.8	U		3.8	U		3.8	U	
BENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOCHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMODICHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOFORM		0.75	U		0.75	U		0.75	U		0.75	U	
BROMOMETHANE		0.75	UJ	C	0.75	UJ	C	0.75	UJ	C	0.75	UJ	C
CARBON DISULFIDE		0.75	U		0.75	U		0.75	U		0.75	U	
CARBON TETRACHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLORODIBROMOMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROFORM		0.75	U		0.75	U		0.75	U		0.75	U	
CHLOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
CIS-1,2-DICHLOROETHENE		0.75	U		0.52	J	P	0.75	U		0.75	U	
CIS-1,3-DICHLOROPROPENE		0.75	U		0.75	U		0.75	U		0.75	U	
CYCLOHEXANE		0.75	U		0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03TB04-20190920		
SDG: EPR-031	LAB_ID	3059275001		
FRACTION: OV	SAMP_DATE	9/20/2019		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
1,1,1-TRICHLOROETHANE		0.75	U	
1,1,2,2-TETRACHLOROETHANE		0.75	U	
1,1,2-TRICHLOROETHANE		0.75	U	
1,1,2-TRICHLOROTRIFLUOROETHANE		0.75	U	
1,1-DICHLOROETHANE		0.75	U	
1,1-DICHLOROETHENE		0.75	UJ	C
1,2,3-TRICHLOROBENZENE		0.75	UJ	E
1,2,4-TRICHLOROBENZENE		0.75	U	
1,2-DIBROMO-3-CHLOROPROPANE		2.5	U	
1,2-DIBROMOETHANE		0.75	U	
1,2-DICHLOROBENZENE		0.75	U	
1,2-DICHLOROETHANE		0.75	U	
1,2-DICHLOROPROPANE		0.75	U	
1,3-DICHLOROBENZENE		0.75	U	
1,4-DICHLOROBENZENE		0.75	U	
1,4-DIOXANE		62.5	UJ	C
2-BUTANONE		3.8	UJ	C
2-HEXANONE		3.8	U	
4-METHYL-2-PENTANONE		3.8	U	
ACETONE		3.8	U	
BENZENE		0.75	U	
BROMOCHLOROMETHANE		0.75	U	
BROMODICHLOROMETHANE		0.75	U	
BROMOFORM		0.75	U	
BROMOMETHANE		0.75	UJ	C
CARBON DISULFIDE		0.75	U	
CARBON TETRACHLORIDE		0.75	U	
CHLOROBENZENE		0.75	U	
CHLORODIBROMOMETHANE		0.75	U	
CHLOROETHANE		0.75	U	
CHLOROFORM		0.75	U	
CHLOROMETHANE		0.75	U	
CIS-1,2-DICHLOROETHENE		0.75	U	
CIS-1,3-DICHLOROPROPENE		0.75	U	
CYCLOHEXANE		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03DUP02-20190920			03MW03I-20190920			03MW03SI-20190920			03MW04I-20190920		
SDG: EPR-031	LAB_ID	3059275005			3059275003			3059275002			3059275004		
FRACTION: OV	SAMP_DATE	9/20/2019			9/20/2019			9/20/2019			9/20/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	03MW03SI-20190920											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLORODIFLUOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
ETHYLBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
ISOPROPYLBENZENE		0.75	U		0.75	U		0.75	U		0.75	U	
METHYL ACETATE		0.75	UJ	C	0.75	UJ	C	0.75	UJ	C	0.75	UJ	C
METHYL CYCLOHEXANE		0.75	U		0.75	U		0.75	U		0.75	U	
METHYL TERT-BUTYL ETHER		0.75	U		0.75	U		0.75	U		0.75	U	
METHYLENE CHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	
STYRENE		0.75	U		0.75	U		0.75	U		0.75	U	
TETRACHLOROETHENE		7.3			1.4			7.2			0.75	U	
TOLUENE		0.75	U		0.75	U		0.75	U		0.75	U	
TOTAL XYLENES		2.3	U		2.3	U		2.3	U		2.3	U	
TRANS-1,2-DICHLOROETHENE		0.75	UJ	C	0.75	UJ	C	0.75	UJ	C	0.75	UJ	C
TRANS-1,3-DICHLOROPROPENE		0.75	U		0.75	U		0.75	U		0.75	U	
TRICHLOROETHENE		0.75	U		0.75	U		0.75	U		0.75	U	
TRICHLOROFLUOROMETHANE		0.75	U		0.75	U		0.75	U		0.75	U	
VINYL CHLORIDE		0.75	U		0.75	U		0.75	U		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03TB04-20190920		
SDG: EPR-031	LAB_ID	3059275001		
FRACTION: OV	SAMP_DATE	9/20/2019		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
DICHLORODIFLUOROMETHANE		0.75	U	
ETHYLBENZENE		0.75	U	
ISOPROPYLBENZENE		0.75	U	
METHYL ACETATE		0.75	UJ	C
METHYL CYCLOHEXANE		0.75	U	
METHYL TERT-BUTYL ETHER		0.75	U	
METHYLENE CHLORIDE		0.75	U	
STYRENE		0.75	U	
TETRACHLOROETHENE		0.75	U	
TOLUENE		0.75	U	
TOTAL XYLENES		2.3	U	
TRANS-1,2-DICHLOROETHENE		0.75	UJ	C
TRANS-1,3-DICHLOROPROPENE		0.75	U	
TRICHLOROETHENE		0.75	U	
TRICHLOROFLUOROMETHANE		0.75	U	
VINYL CHLORIDE		0.75	U	

PROJ_NO: 08005-WE04	NSAMPLE	03DUP02-20190920			03MW03I-20190920			03MW03SI-20190920			03MW04I-20190920		
SDG: EPR-031	LAB_ID	3059275005			3059275003			3059275002			3059275004		
FRACTION: M	SAMP_DATE	9/20/2019			9/20/2019			9/20/2019			9/20/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF	03MW03SI-20190920											
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ALUMINUM		0.059	U		0.059	U		0.059	U		0.059	U	
ANTIMONY		0.0015	U		0.0015	U		0.0015	U		0.0015	U	
ARSENIC		0.002	U		0.0021	J	P	0.002	U		0.002	U	
BARIUM		0.3			0.25			0.3			0.43		
BERYLLIUM		0.0007	U		0.0007	U		0.0007	U		0.0007	U	
CADMIUM		0.0007	U		0.0007	U		0.0007	U		0.0007	U	
CALCIUM		22.2			28			22.5			35.5		
CHROMIUM		0.0015	U		0.00079	J	P	0.0015	U		0.0015	U	
COBALT		0.0037	U		0.0037	U		0.0037	U		0.0037	U	
COPPER		0.0037	U		0.0037	U		0.0039	U	A	0.0046	U	A
IRON		0.037	U		0.037	U		0.037	U		0.037	U	
LEAD		0.0015	U		0.0015	U		0.0015	U		0.0015	U	
MAGNESIUM		9.1			15.5			9.2			10.9		
MANGANESE		0.0037	U		0.0037	U		0.0037	U		0.0037	U	
MERCURY		0.00033	U		0.00033	U		0.00033	U		0.00033	U	
NICKEL		0.0037	U		0.0037	U		0.0037	U		0.0037	U	
POTASSIUM		0.58			1.4			0.59			0.81		
SELENIUM		0.0037	U		0.0037	U		0.0037	U		0.0019	J	P
SILVER		0.0015	U		0.0015	U		0.0015	U		0.0015	U	
SODIUM		8.8			8.4			9.1			15.6		
THALLIUM		0.0004	U	A	0.0007	U		0.0007	U		0.0007	U	
VANADIUM		0.0018	J	P	0.0019	J	P	0.0018	J	P	0.0015	U	
ZINC		0.0031	U	A	0.0032	U	A	0.005	U	A	0.0056	U	A

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03TB04-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092711.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03TB04-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275001

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092711.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW03SI-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092719.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW03SI-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092719.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	7.2	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW03I-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092720.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.52	J
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW03I-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275003

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092720.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	1.4	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW04I-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092721.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW04I-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275004

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092721.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03DUP02-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092722.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	62.5	U
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03DUP02-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092722.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	7.3	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-031 **Method Type:** 6020 3015 DOD

Sample ID: 3059275002 **Client ID:** 03MW03SI-20190920

Matrix: WATER **Date Received:** 9/21/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	05:06:30
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:06:30
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	02:08:17
Barium	7440-39-3	0.30	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:08:17
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:06:30
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	05:06:30
Calcium	7440-70-2	22.5	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:06:30
Chromium	7440-47-3	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:06:30
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:06:30
Copper	7440-50-8	0.0039	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:08:17
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	02:08:17
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:06:30
Magnesium	7439-95-4	9.2	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:06:30
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:06:30
Nickel	7440-02-0	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:06:30
Potassium	7440-09-7	0.59	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:06:30
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:08:17
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:06:30
Sodium	7440-23-5	9.1	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:06:30
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:06:30
Vanadium	7440-62-2	0.0018	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:06:30
Zinc	7440-66-6	0.0050	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:08:17

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-031 **Method Type:** 6020 3015 DOD

Sample ID: 3059275003 **Client ID:** 03MW03I-20190920

Matrix: WATER **Date Received:** 9/21/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	05:10:04
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:10:04
Arsenic	7440-38-2	0.0021	mg/L	J		M	0.0033	0.002	0.0010	1.00	9/27/2019	02:11:35
Barium	7440-39-3	0.25	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:11:35
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:10:04
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	05:10:04
Calcium	7440-70-2	28.0	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:10:04
Chromium	7440-47-3	0.00079	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:10:04
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:10:04
Copper	7440-50-8	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:11:35
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	02:11:35
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:10:04
Magnesium	7439-95-4	15.5	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:10:04
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:10:04
Nickel	7440-02-0	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:10:04
Potassium	7440-09-7	1.4	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:10:04
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:11:35
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:10:04
Sodium	7440-23-5	8.4	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:10:04
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:10:04
Vanadium	7440-62-2	0.0019	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:10:04
Zinc	7440-66-6	0.0032	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:11:35

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-031 **Method Type:** 6020 3015 DOD

Sample ID: 3059275004 **Client ID:** 03MW04I-20190920

Matrix: WATER **Date Received:** 9/21/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	05:13:19
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:13:19
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	02:14:52
Barium	7440-39-3	0.43	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:14:52
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:13:19
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	05:13:19
Calcium	7440-70-2	35.5	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:13:19
Chromium	7440-47-3	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:13:19
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:13:19
Copper	7440-50-8	0.0046	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:14:52
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	02:14:52
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:13:19
Magnesium	7439-95-4	10.9	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:13:19
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:13:19
Nickel	7440-02-0	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:13:19
Potassium	7440-09-7	0.81	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:13:19
Selenium	7782-49-2	0.0019	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:14:52
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:13:19
Sodium	7440-23-5	15.6	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:13:19
Thallium	7440-28-0	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:13:19
Vanadium	7440-62-2	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:13:19
Zinc	7440-66-6	0.0056	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:14:52

Comments:

6020 3015 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-031 **Method Type:** 6020 3015 DOD

Sample ID: 3059275005 **Client ID:** 03DUP02-20190920

Matrix: WATER **Date Received:** 9/21/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 45.00 **Final Vol:** 50.0

Prep Batch ID: 544196 **Prep Date:** 9/25/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Aluminum	7429-90-5	0.059	mg/L	U		M	0.089	0.059	0.030	1.00	9/26/2019	05:30:58
Antimony	7440-36-0	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:30:58
Arsenic	7440-38-2	0.0020	mg/L	U		M	0.0033	0.002	0.0010	1.00	9/27/2019	02:18:08
Barium	7440-39-3	0.30	mg/L			M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:18:08
Beryllium	7440-41-7	0.00070	mg/L	U		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:30:58
Cadmium	7440-43-9	0.00070	mg/L	U		M	0.0011	0.0007	0.00037	1.00	9/26/2019	05:30:58
Calcium	7440-70-2	22.2	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:30:58
Chromium	7440-47-3	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:30:58
Cobalt	7440-48-4	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:30:58
Copper	7440-50-8	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:18:08
Iron	7439-89-6	0.037	mg/L	U		M	0.056	0.037	0.019	1.00	9/27/2019	02:18:08
Lead	7439-92-1	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:30:58
Magnesium	7439-95-4	9.1	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:30:58
Manganese	7439-96-5	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:30:58
Nickel	7440-02-0	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/26/2019	05:30:58
Potassium	7440-09-7	0.58	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:30:58
Selenium	7782-49-2	0.0037	mg/L	U		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:18:08
Silver	7440-22-4	0.00150	mg/L	U		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:30:58
Sodium	7440-23-5	8.8	mg/L			M	0.11	0.073	0.037	1.00	9/26/2019	05:30:58
Thallium	7440-28-0	0.00040	mg/L	J		M	0.0011	0.0007	0.00030	1.00	9/26/2019	05:30:58
Vanadium	7440-62-2	0.0018	mg/L	J		M	0.0022	0.0015	0.00074	1.00	9/26/2019	05:30:58
Zinc	7440-66-6	0.0031	mg/L	J		M	0.0056	0.0037	0.0019	1.00	9/27/2019	02:18:08

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-031 **Method Type:** 7470 DOD

Sample ID: 3059275002 **Client ID:** 03MW03SI-20190920

Matrix: WATER **Date Received:** 9/21/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	15:02:33

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-031 **Method Type:** 7470 DOD

Sample ID: 3059275003 **Client ID:** 03MW03I-20190920

Matrix: WATER **Date Received:** 9/21/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	15:03:46

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-031 **Method Type:** 7470 DOD

Sample ID: 3059275004 **Client ID:** 03MW04I-20190920

Matrix: WATER **Date Received:** 9/21/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	15:04:57

Comments:

7470 DOD

- 1 -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc. **SDG No.:** EPR-031 **Method Type:** 7470 DOD

Sample ID: 3059275005 **Client ID:** 03DUP02-20190920

Matrix: WATER **Date Received:** 9/21/2019 **Level:** Low

% Solids: **Sample Wt/Vol:** 5.00 **Final Vol:** 5.0

Prep Batch ID: 544296 **Prep Date:** 9/26/2019 **Total/Dissolved:** TOTAL

Analyte	CAS No.	Concentration	Units	C	Qual	M	LOQ	LOD	MDL	Dil	Analytical Date	Analytical Time
Mercury	7439-97-6	0.00033	mg/L	U		CV	0.00050	0.00033	0.00016	1.00	9/26/2019	15:06:09

Comments:

APPENDIX C

SUPPORT DOCUMENTATION

Sample Receipt

Samples arrived at ALS via courier on September 21, 2019. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Subcontracted Data

Four (4) water samples were submitted to ALS Fort Collins, Colorado for the analysis of isotopic uranium, radium-226, and strontium-90. The data has been included at the end of this data package.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Five (5) ground water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within holding time.

Initial Calibrations Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note:** The batch LCS also serves as a second source (ICV).

- In 30177576 LCS, several analytes were recovered outside control limits.

Continuing Calibration Verifications. Continuing calibrations were properly analyzed and met method criteria for all target analytes, except as follows:

- In file 1801-09271922:08, 1,4-Dioxane was recovered below control limits.

Blanks. Target analytes were not detected in the method blanks, except as follows:

- In 3018649 MB, 1,4-Dioxane was detected at 73.7 µg/L.

Surrogates. Recoveries were within control limits.

Laboratory control samples. Target analytes were within control limits, except as follows:

- In 3018650 LCS, 1,4-Dioxane and 1,2,3-Trichlorobenzene were recovered outside control limits.

Internal Standards. Internal standard results met method criteria.

Total Metals by SW-846 Method 6020A

Sample handling. Four (4) water samples were digested by SW-846 Method 3015 and analyzed for total metals on the Agilent 7700x ICP-MS, using SW-846 Method 6020A. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Spikes. A matrix spike and matrix spike duplicate was not performed on a sample in this data deliverable.

Dilution Test. A dilution test was not performed on a sample in this data deliverable.

Total Mercury in Water by EPA Method 7470A

Sample handling. Four (4) water samples were analyzed for total mercury using EPA method 7470A. The samples were digested and analyzed within the 28-day holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within control limits.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Sample. The laboratory control sample was recovered within the control limits.

Spikes. A matrix spike/matrix spike duplicate was not performed on samples in this deliverable group.

I _Jennifer M. Stanhope Lamoreux_, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated PDF data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at _717-944-5541_ if there are any questions or problems with the enclosed electronic deliverables.

Signature: Title:_Reporting Manager_ Date:_11/8/2019_

Tetra Tech

ALS-Middletown
Case Narrative
EPR-031 (3059275)

Sample Management

This report contains the results of the analysis of five (5) water samples collected on September 20, 2019. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is >40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

301 Fulling Mill Road
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

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

COC ALS [of]

* 3059275 *

Client Name: Tetra Tech
Address: 234 Mall Boulevard Suite 260
King of Prussia, PA 19406
Contact: Trisha Moore
Phone#: 610 382 1171
Project Name/#: Willow Grove Sites 3 and 12
Bill To: Tetra Tech Foster Plaza 7

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

W.O. Temp: C Therm ID:
Analyst Initials:
Courier/Tracking #:
Purchase Order #:
Project Comments:

ALS Field Services: □ Pickup □ Labor □ Composite Sampling □ Rental Equipment
Other:

	Container Type	40ml vial	Poly	Poly	Poly	Poly					
	Container Size	40ml	125ml	1Lite	1Lite	1Lite					
	Preservative	HCl	HNO_3	HNO_3	HNO_3	HNO_3					

ANALYSES/METHOD REQUESTED

	Sample Description/Location (as it will appear on the lab report)	Date Collected mm/dd/yy	Time hh:mm	*G or C	**Matrix	40ml VOA vial VOC's	125ml poly Metals and Hg	1 Liter Poly Radium 226	1 Liter Poly Uranium 238	1 Liter Poly Strontium 90	Sample/COC Comments
	Enter Number of Containers Per Sample or Field Results Below.										
1	03TB04-20190920	9/20/19	0700	G	~~AQ~~	2					
2	03MW03SI-20190920	9/20/19	1020	G	GW	2	1	1	1	1	
3	03MW03I-20190920	9/20/19	1225	G	GW	2	1	1	1	1	
4	03MW04I-20190920	9/20/19	1515	G	GW	2	1	1	1	1	
5	03DUP02-20190920	9/20/19	1200	G	GW	2	1	1	1	1	
6	~~ABOZ 20190920~~	~~9/20/19~~		G	~~AQ~~						CM 9/20/19
7											
8											
9											
10											

SAMPLED BY (Please Print): Charles Mayer

Sampler Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Charles Mayer Tetra Tech	9/20/19	1900	2 FedEx		
3 FedEx			4 Kathy Jessup	9/21/19	0927
5			6		
7			8		
9			10		

Data Deliverables: [✓] Standard [ ] CLP-like [ ] USACE/DOD

Special Processing: USACE [ ]

State Samples Collected In: [ ] NY [ ] NJ [✓] PA

Reportable to PADEP? Yes [ ] No [✓]
PWSID #

Sample Disposal: Lab [✓] Special [ ]

EDDS: Format Type-

other

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

ALS SHIPPING ADDRESS: 301 Fulling Mill Road, Middletown, PA 17057

Rev 04/19

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

Condition of Sample Receipt Form

Client: Tetra Tech | Work Order #: 3059275 | Initials: CS | Date: 9/21

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 7763 0176 6008			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: ____

Temperature (°C): 3

Thermometer ID: 403

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

Rev. 1/10/2019

ALS Environmental
34 Dogwood Lane ▪ Middletown, PA 17057 ▪ Phone: 717-944-5541 ▪ Fax: 717-944-1430 ▪ www.alsglobal.com

Internal Chain of Custody

Work Order: 3059275

3059275001-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275001-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275001-C	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275002-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275002-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275002-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275002-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275002-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275002-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To

Internal Chain of Custody
Work Order: 3059275

3059275002-F (cont)	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275002-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275003-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275003-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275003-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275003-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275003-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275003-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275003-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To

Internal Chain of Custody

Work Order: 3059275

3059275003-G (cont)	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275004-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275004-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275004-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275004-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275004-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275004-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275004-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275005-A	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A

Internal Chain of Custody

Work Order: 3059275

3059275005-A (cont)	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275005-B	G - CLEAR GLASS		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:28	V47	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275005-C	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275005-D	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275005-E	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275005-F	P - PLASTIC		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:25	META-PREP	Storage	Stevenson, Ms. Jasmine A
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

3059275005-G	COC - Chain of Custody		
Transfer Date	To Location	Transfer Reason	Transferred To
09-21-19 12:19	RECEIVING	LOGIN	Stevenson, Ms. Jasmine A
09-21-19 09:27	*Sample Received At Lab*		

ALS Environmental

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

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

SAMPLE SUMMARY

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3059275001	03TB04-20190920	Water	9/20/2019 07:00	9/21/2019 09:27	Collected by Client
3059275002	03MW03SI-20190920	Water	9/20/2019 10:20	9/21/2019 09:27	Collected by Client
3059275003	03MW03I-20190920	Water	9/20/2019 12:25	9/21/2019 09:27	Collected by Client
3059275004	03MW04I-20190920	Water	9/20/2019 15:15	9/21/2019 09:27	Collected by Client
3059275005	03DUP02-20190920	Water	9/20/2019 12:00	9/21/2019 09:27	Collected by Client

ALS Environmental

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

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

SAMPLE SUMMARY

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

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

ANALYTICAL RESULTS

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3059275001	1	03TB04-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				
3059275001	2	03TB04-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275002	1	03MW03SI-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275002	2	03MW03SI-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				
3059275003	1	03MW03I-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275003	2	03MW03I-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				
3059275004	1	03MW04I-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275004	2	03MW04I-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				
3059275005	1	03DUP02-20190920	SW846 8260C	1,4-Dioxane
The Method Blank for method SW846 8260C reported a value greater than the reporting level for the analyte 1,4-Dioxane.				
3059275005	2	03DUP02-20190920	SW846 8260C	1,2,3-Trichlorobenzene
The QC sample type LCS for method SW846 8260C was outside the control limits for the analyte 1,2,3-Trichlorobenzene. The % Recovery was reported as 64.8 and the control limits were 69 to 129.				

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3059275 EPR031|Willow Grove Sites 3 &

Lab ID	Sample ID	Analysis Method	Prep Method
3059275001	03TB04-20190920	SW846 8260C	
3059275002	03MW03SI-20190920	SW846 6020A	SW846 3015
3059275002	03MW03SI-20190920	SW846 7470A	SW846 7470A
3059275002	03MW03SI-20190920	SW846 8260C	
3059275002	03MW03SI-20190920	Subcontract	
3059275003	03MW03I-20190920	SW846 6020A	SW846 3015
3059275003	03MW03I-20190920	SW846 7470A	SW846 7470A
3059275003	03MW03I-20190920	SW846 8260C	
3059275003	03MW03I-20190920	Subcontract	
3059275004	03MW04I-20190920	SW846 6020A	SW846 3015
3059275004	03MW04I-20190920	SW846 7470A	SW846 7470A
3059275004	03MW04I-20190920	SW846 8260C	
3059275004	03MW04I-20190920	Subcontract	
3059275005	03DUP02-20190920	SW846 6020A	SW846 3015
3059275005	03DUP02-20190920	SW846 7470A	SW846 7470A
3059275005	03DUP02-20190920	SW846 8260C	
3059275005	03DUP02-20190920	Subcontract	

Volatile Organic Compounds by Method 8260 Summary Forms

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-031

Lab File ID: 719092600.D BFB Injection Date: 9/26/2019

Instrument ID: ms07.i BFB Injection Time: 22:31

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: Y/N N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.3
75	30.0 - 60.0% of mass 95	46.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.5(0.6) 1
174	50.0 - 100.0% of mass 95	78.3
175	5.0 - 9.0% of mass 174	6.1 (7.8) 1
176	95.0 - 101.0% of mass 174	76.7 (97.9) 1
177	5.0 - 9.0% of mass 176	5.1 (6.7) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
VSTD00.5	VSTD00.5	719092603.D	9/26/2019	23:47
1234	1234	719092604.D	9/27/2019	00:09
1235	1235	719092605.D	9/27/2019	00:32
1236	1236	719092606.D	9/27/2019	00:54
1237	1237	719092607.D	9/27/2019	01:17
1238	1238	719092608.D	9/27/2019	01:40
1239	1239	719092609.D	9/27/2019	02:02
3017576(LCS)	3017576	719092612.D	9/27/2019	03:10

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Acetone	0.01346	0.01779		A		0.014940		9.72530
Acrolein	0.04084	0.04027		A		0.039280		6.37445
Acrylonitrile	0.06764	0.05726		A		0.063960		7.48448
Acetonitrile	0.01137	0.01469		A		0.012140		10.60283
tert-Amyl Ethylether	0.50183	0.34883		A		0.431230		14.53917
tert-Amyl methyl ether	0.57569	0.43607		A		0.507550		10.99936
tert-Amyl Alcohol	0.00636	0.00621		A		0.006130		10.95928
Benzene	0.83536	0.83979		A		0.863580		4.27288
Benzyl Chloride	1148860	799		Q	0.000000	0.182610	0.005810	0.99977
Bromobenzene	0.57168	0.67537		A		0.603220		6.21513
Bromochloromethane	0.09923	0.11428		A		0.103900		6.20292
Bromodichloromethane	0.28973	0.22831		A		0.261030		10.51595
Bromoform *	0.37635	0.26183		A		0.324970		14.27814
Bromomethane	0.11006	0.12510		A		0.110350		6.71732
2-Butanone	0.02406	0.02174		A		0.023040		9.18130
tert.- Butyl Alcohol		1348		Q	0.000000	0.006570	0.000050	0.99927
tert-Butylbenzene	0.46494	0.37327		A		0.433520		11.07836
n-Butylbenzene	2479163	3028		Q	0.000000	0.410350	0.009990	0.99992
sec-Butylbenzene	2.31698	1.82224		A		2.217760		13.53333
Carbon Disulfide	0.63450	0.83838		A		0.658870		12.65808
Carbon Tetrachloride	0.28072	0.21948		A		0.250810		11.30024
Chloroacetonitrile	325357	713		L	0.000000	91.459923		0.99597
Chlorobenzene *	1.24804	1.38707		A		1.289350		3.68634
1-Chlorobutane	0.23863	0.23415		A		0.232910		2.76667
Chlorodibromomethane	0.51497	0.35990		A		0.432090		14.90078
Chloroethane	2210817	10662		Q	0.000000	0.179860	-0.003840	0.99983
2-Chloroethylvinyl ether	1680573	1897		L	0.000000	8.698240		0.99746
Chloroform **	0.39320	0.41264		A		0.396520		2.78577
1-Chlorohexane	4624078	6113		L	0.000000	1.324940		0.99967
Chloromethane *	0.25769	0.31838		A		0.270750		8.38752
Chloroprene	0.33818	0.28625		A		0.319790		7.48917
3-Chloro-1-propene	0.29895	0.28625		A		0.288050		6.58258
o-Chlorotoluene	1.88749	1.87318		A		1.898370		5.25915
p-Chlorotoluene	1.73718	1.72849		A		1.740830		4.85164
Cyclohexane	0.35738	0.28203		A		0.333870		10.50344
1,2-Dibromo-3-Chloropropane	507424	416		Q	0.000000	0.083760	0.002090	0.99968

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2-Dibromoethane	0.44954	0.38977		A		0.412840		7.84078
Dibromomethane	0.13391	0.12901		A		0.127720		4.23322
trans-1,4-Dichloro-2-butene	907411	1139		L	0.000000	5.779770		0.99935
1,2-Dichlorobenzene	0.96870	0.99943		A		0.938890		5.57942
1,3-Dichlorobenzene	1.06896	1.13995		A		1.047610		5.49156
1,4-Dichlorobenzene	1.04361	1.36325		A		1.094890		10.90314
Dichlorodifluoromethane	0.32073	0.30639		A		0.315050		5.12120
1,1-Dichloroethane *	0.37688	0.33502		A		0.364390		5.71218
1,2-Dichloroethene, Total	0.29385	0.29313		A		0.287870		2.37424
1,2-Dichloroethane	0.26320	0.26616		A		0.258480		2.93002
1,1-Dichloroethene **	0.27772	0.25226		A		0.254890		8.01169
cis-1,2-Dichloroethene	0.30282	0.30027		A		0.296900		1.99153
trans-1,2-Dichloroethene	0.28487	0.28600		A		0.278830		2.88111
Dichlorofluoromethane	0.36578	0.35784		A		0.369580		4.27659
1,1-Dichloro-2-Propanone	297043	413		L	0.000000	104		0.99922
2,2-Dichloropropane	0.29987	0.26023		A		0.276230		6.47745
1,3-Dichloropropane	0.77653	0.70408		A		0.744640		3.90206
1,2-Dichloropropane **	0.23871	0.19839		A		0.223150		7.32027
1,1-Dichloropropene	0.31971	0.28806		A		0.305070		5.23212
cis-1,3-Dichloropropene	0.85006	0.67531		A		0.744720		11.40394
trans-1,3-Dichloropropene	0.75815	0.60583		A		0.668270		11.45731
1,3-Dichloropropene, Total	0.80411	0.64057		A		0.706500		11.42265
Diisobutylene	8679520	80914		L	0.000000	1.675240		0.99851
Diisopropyl ether	0.67927	0.56837		A		0.640840		8.00127
1,4-Dioxane	129781			L	0.000000	2747		0.99473
Ethyl Acetate	0.20033	0.18433		A		0.187650		6.82027
Ethyl ether	0.12322	0.11877		A		0.116710		8.92665
Ethyl Methacrylate	4239907	5839		L	0.000000	1.451750		0.99950
Ethyl tert-butyl ether	0.62689	0.48414		A		0.568690		10.65261
Ethylbenzene **	0.71294	0.71766		A		0.701270		3.97217
Freon 113	0.21835	0.20312		A		0.204460		7.47496
Heptane	2390722	3875		Q	0.000000	0.117870	0.007350	0.99988
Hexachlorobutadiene	1036524	2507		Q	0.000000	0.148040	0.007700	0.99988
Hexachloroethane	2049078	2344		Q	0.000000	0.321780	0.010890	0.99997
Hexane	0.46599	0.34686		A		0.414460		11.61912
2-Hexanone	4490045	7376		L	0.000000	6.836340		0.99960

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Iodomethane	1382757	690		Q	0.000000	0.065470	0.004760	0.99724
Isobutyl alcohol	168180	517		L	0.000000	850		0.99968
Isopropyl Alcohol		1185		Q	0.000000	0.001570	0.000040	0.99988
Isopropylbenzene	2.34275	2.19256		A		2.430030		8.73367
p-Isopropyltoluene	2844196	3485		L	0.000000	1.852440		0.99897
Methyl acetate	0.03283	0.02783		A		0.032370		14.36391
Methyl acrylate	0.19858	0.16360		A		0.183850		9.68054
Methacrylonitrile	0.09031	0.07986		A		0.086520		8.90228
Methyl cyclohexane	0.95878	0.63939		A		0.825020		14.41250
Methyl methacrylate	2678305	4234		L	0.000000	5.366240		0.99972
Methyl t-Butyl Ether	0.55841	0.44727		A		0.517460		8.69166
4-Methyl-2-Pentanone(MIBK)	8879024	12389		L	0.000000	3.448350		0.99966
Methylene Chloride	2899030	9497		L	0.000000	4.978390		0.99930
Naphthalene		2728		Q	0.000000	0.638090	0.099290	0.99418
Nitrobenzene	450615			Q	0.000000	0.001710	0.000100	0.99898
2-Nitropropane	3447114	4933		L	0.000000	8.927850		0.99943
Octane	1511894	3305		Q	0.000000	0.166900	0.012050	0.99968
Pentachloroethane	0.40458	0.35670		A		0.379580		6.69181
Pentane	0.19020	0.20506		A		0.207150		7.50739
n-Propanol	0.01128	0.01190		A		0.011440		3.63945
Propionitrile	0.02073	0.02107		A		0.021570		7.15448
n-Propylbenzene	0.68317	0.55010		A		0.654040		10.64739
Styrene	1.58580	1.48293		A		1.557650		7.34088
1,1,1,2-Tetrachloroethane	0.46619	0.36484		A		0.414500		9.53153
1,1,2,2-Tetrachloroethane *	0.64083	0.66296		A		0.659920		3.10559
Tetrachloroethene	0.44703	0.43897		A		0.431410		3.81941
Tetrahydrofuran	0.05266	0.05143		A		0.051910		7.32001
Toluene **	1.24124	1.16688		A		1.208190		5.01601
Total Xylenes	0.82971	0.74878		A		0.796160		7.88005
1,2,3-Trichlorobenzene	2094670	1021		Q	0.000000	0.310050	0.014020	0.99934
1,2,4-Trichlorobenzene	2649638	1171		Q	0.000000	0.397690	0.016900	0.99954
1,1,1-Trichloroethane	0.31645	0.26607		A		0.290180		8.17051
1,1,2-Trichloroethane	0.37765	0.34913		A		0.359400		4.47380
Trichloroethene	0.23226	0.28984		A		0.242780		8.77286
Trichlorofluoromethane	0.33458	0.35633		A		0.359340		5.21498
1,2,3-Trichloropropane	0.18180	0.18892		A		0.189450		3.42303

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
1,2,4-Trimethylbenzene	1.91349	1.50987		A		1.830300		12.00362
1,3,5-Trimethylbenzene	1.87638	1.54627		A		1.822430		11.60222
Vinyl Acetate	692025	986		Q	0.000000	0.041410	0.001050	0.99980
Vinyl Chloride **	0.30496	0.30731		A		0.306960		4.23454
o-Xylene	0.84888	0.68756		A		0.765860		11.26823
mp-Xylene	0.82013	0.77940		A		0.811300		6.57880
4-Bromofluorobenzene	0.52575	0.64131		A		0.556540		6.97396
Dibromofluoromethane	0.18276	0.19174		A		0.184540		2.32737
1,2-Dichloroethane-d4	0.20174	0.22815		A		0.208420		4.64370
Toluene-d8	1.56860	1.73642		A		1.653020		3.56307

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.
SPCC Compounds (*) with required minimum RRF.
CCC Compounds (**) with required maximum %RSD.

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Laboratory Control Spike - Sample No: 3017576

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Acetone	100		115	115	(80-120)
Benzene	20		21.5	108	(80-120)
Bromochloromethane	20		20.5	102	(80-120)
Bromodichloromethane	20		21.4	107	(80-120)
Bromoform	20		21.8	109	(80-120)
Bromomethane	20		14.5	72.6*	(80-120)
2-Butanone	100		122	122*	(80-120)
Carbon Disulfide	20		20.7	104	(80-120)
Carbon Tetrachloride	20		22.9	114	(80-120)
Chlorobenzene	20		20.1	100	(80-120)
Chlorodibromomethane	20		20.9	105	(80-120)
Chloroethane	20		17.8	89	(80-120)
Chloroform	20		20.5	103	(80-120)
Chloromethane	20		19.2	95.9	(80-120)
Cyclohexane	20		23.0	115	(80-120)
1,2-Dibromo-3-Chloropro	20		19.8	98.8	(80-120)
1,2-Dibromoethane	20		20.3	101	(80-120)
1,2-Dichlorobenzene	20		20.4	102	(80-120)
1,3-Dichlorobenzene	20		20.3	101	(80-120)
1,4-Dichlorobenzene	20		19.5	97.6	(80-120)
Dichlorodifluoromethane	20		18.0	90.1	(80-120)
1,1-Dichloroethane	20		23.4	117	(80-120)
1,2-Dichloroethane	20		20.7	104	(80-120)
1,1-Dichloroethene	20		27.0	135*	(80-120)
cis-1,2-Dichloroethene	20		21.0	105	(80-120)
trans-1,2-Dichloroethen	20		24.4	122*	(80-120)
1,2-Dichloropropane	20		21.5	107	(80-120)
cis-1,3-Dichloropropene	20		21.0	105	(80-120)
trans-1,3-Dichloroprope	20		21.1	106	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 6 out of 51 outside limits

Comments:

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Laboratory Control Spike - Sample No: 3017576

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
1,4-Dioxane	500		903	181*	(80-120)
Ethylbenzene	20		20.7	103	(80-120)
Freon 113	20		20.9	105	(80-120)
2-Hexanone	100		95.0	95	(80-120)
Isopropylbenzene	20		22.7	114	(80-120)
Methyl acetate	20		25.4	127*	(80-120)
Methyl cyclohexane	20		22.7	114	(80-120)
Methyl t-Butyl Ether	20		21.8	109	(80-120)
4-Methyl-2-Pentanone(MI	100		97.1	97.1	(80-120)
Methylene Chloride	20		22.0	110	(80-120)
Styrene	20		21.6	108	(80-120)
1,1,2,2-Tetrachloroetha	20		21.0	105	(80-120)
Tetrachloroethene	20		21.2	106	(80-120)
Toluene	20		20.9	104	(80-120)
Total Xylenes	60		64.0	107	(80-120)
1,2,3-Trichlorobenzene	20		17.9	89.7	(80-120)
1,2,4-Trichlorobenzene	20		18.8	94	(80-120)
1,1,1-Trichloroethane	20		23.2	116	(80-120)
1,1,2-Trichloroethane	20		20.4	102	(80-120)
Trichloroethene	20		20.2	101	(80-120)
Trichlorofluoromethane	20		19.9	99.5	(80-120)
Vinyl Chloride	20		19.5	97.6	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 6 out of 51 outside limits

Comments:

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-031

Lab File ID: 719092700.D BFB Injection Date: 9/27/2019

Instrument ID: ms07.i BFB Injection Time: 11:57

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: Y/N N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.9
75	30.0 - 60.0% of mass 95	46.6
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.3
173	Less than 2.0% of mass 174	0.7(0.9) 1
174	50.0 - 100.0% of mass 95	76.0
175	5.0 - 9.0% of mass 174	5.8 (7.6) 1
176	95.0 - 101.0% of mass 174	75.0 (98.7) 1
177	5.0 - 9.0% of mass 176	4.6 (6.2) 2

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1800	1800	719092701.D	9/27/2019	12:25
3018650(LCS)	3018650	719092702.D	9/27/2019	13:37
3018649(MB)	3018649	719092705.D	9/27/2019	15:20
03TB04-20190920	3059275001	719092711.D	9/27/2019	17:38
03MW03SI-20190920	3059275002	719092719.D	9/27/2019	20:38
03MW03I-20190920	3059275003	719092720.D	9/27/2019	21:01
03MW04I-20190920	3059275004	719092721.D	9/27/2019	21:23
03DUP02-20190920	3059275005	719092722.D	9/27/2019	21:46
1801	1801	719092723.D	9/27/2019	22:08

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date/Time: 9/27/2019 12:25

Lab File ID: 719092701.D Init. Calib. Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Init. Calib. Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

COMPOUND	RRF	RRF050	Conc. CC std	MIN RRF	%D	MAX%D	CT	
Acetone	0.0149	0.0134			-10.5	20.0	A	
Acrolein	0.0393	32.0000			81369. *	20.0	A	NT
Acrylonitrile	0.0640	0.0735			14.9	20.0	A	
Acetonitrile	0.0121	0.0117			-3.8	20.0	A	
tert-Amyl Ethylether	0.4312	0.4903			13.7	20.0	A	
tert-Amyl methyl ether	0.5076	0.5665			11.6	20.0	A	
tert-Amyl Alcohol	0.0061	0.0042			-32.1 *	20.0	A	NT
Benzene	0.8636	0.9254			7.2	20.0	A	
Benzyl Chloride	50.0000		47.3050		-5.4	20.0	Q	
Bromobenzene	0.6032	0.6299			4.4	20.0	A	
Bromochloromethane	0.1039	0.1121			7.9	20.0	A	
Bromodichloromethane	0.2610	0.2941			12.7	20.0	A	
Bromoform	0.3250	0.3503		0.100	7.8	20.0	A	
Bromomethane	0.1103	0.1009			-8.6	20.0	A	
2-Butanone	0.0230	0.0226			-2.1	20.0	A	
tert.- Butyl Alcohol	250		158		-37.0 *	20.0	Q	NT
tert-Butylbenzene	0.4335	0.4980			14.9	20.0	A	
n-Butylbenzene	50.0000		58.4508		16.9	20.0	Q	
sec-Butylbenzene	2.2178	2.6443			19.2	20.0	A	
Carbon Disulfide	0.6589	0.6027			-8.5	20.0	A	
Carbon Tetrachloride	0.2508	0.2770			10.4	20.0	A	
Chloroacetonitrile	250		218		-12.8	20.0	L	
Chlorobenzene	1.2894	1.3623		0.300	5.7	20.0	A	
1-Chlorobutane	0.2329	0.2429			4.3	20.0	A	
Chlorodibromomethane	0.4321	0.4856			12.4	20.0	A	
Chloroethane	50.0000		50.7785		1.6	20.0	Q	
2-Chloroethylvinyl ether	50.0000		44.8410		-10.3	20.0	L	
Chloroform	0.3965	0.4112			3.7	20.0	A	
1-Chlorohexane	50.0000		50.4795		1.0	20.0	L	
Chloromethane	0.2707	0.2537		0.100	-6.3	20.0	A	
Chloroprene	0.3198	0.3436			7.4	20.0	A	
3-Chloro-1-propene	0.2880	0.3092			7.3	20.0	A	
o-Chlorotoluene	1.8984	2.0707			9.1	20.0	A	
p-Chlorotoluene	1.7408	1.8994			9.1	20.0	A	
Cyclohexane	0.3339	0.3651			9.3	20.0	A	

Calibration Type: A=Average Response Factor, L=Linear Regression, Q=Quadratic Regression
Compounds with "Calibration Type" other than "A" are calculated as % Drift due to alternate calibration type.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date/Time: 9/27/2019 12:25

Lab File ID: 719092701.D Init. Calib. Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Init. Calib. Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

COMPOUND	RRF	RRF050	Conc. CC std	MIN RRF	%D	MAX%D	CT	
1,2-Dibromo-3-Chloropropane	50.0000		44.2950		-11.4	20.0	Q	
1,2-Dibromoethane	0.4128	0.4447			7.7	20.0	A	
Dibromomethane	0.1277	0.1360			6.5	20.0	A	
trans-1,4-Dichloro-2-butene	50.0000		45.1247		-9.8	20.0	L	
1,2-Dichlorobenzene	0.9389	1.0022			6.7	20.0	A	
1,3-Dichlorobenzene	1.0476	1.1157			6.5	20.0	A	
1,4-Dichlorobenzene	1.0949	1.1122			1.6	20.0	A	
Dichlorodifluoromethane	0.3151	0.3025			-4.0	20.0	A	
1,1-Dichloroethane	0.3644	0.3947			8.3	20.0	A	
1,2-Dichloroethene, Total	0.2879	0.3030			5.3	20.0	A	
1,2-Dichloroethane	0.2585	0.2721			5.3	20.0	A	
1,1-Dichloroethene	0.2549	0.2429			-4.7	20.0	A	
cis-1,2-Dichloroethene	0.2969	0.3132			5.5	20.0	A	
trans-1,2-Dichloroethene	0.2788	0.2928			5.0	20.0	A	
Dichlorofluoromethane	0.3696	0.3661			-0.9	20.0	A	
1,1-Dichloro-2-Propanone	250		187		-25.3 *	20.0	L	NT
2,2-Dichloropropane	0.2762	0.2843			2.9	20.0	A	
1,3-Dichloropropane	0.7446	0.7884			5.9	20.0	A	
1,2-Dichloropropane	0.2231	0.2460			10.2	20.0	A	
1,1-Dichloropropene	0.3051	0.3255			6.7	20.0	A	
cis-1,3-Dichloropropene	0.7447	0.8272			11.1	20.0	A	
trans-1,3-Dichloropropene	0.6683	0.7454			11.5	20.0	A	
1,3-Dichloropropene, Total	0.7065	0.7863			11.3	20.0	A	
Diisobutylene	50.0000		53.0234		6.0	20.0	L	
Diisopropyl ether	0.6408	0.7017			9.5	20.0	A	
1,4-Dioxane	1250		1206		-3.6	20.0	L	
Ethyl Acetate	0.1876	0.1808			-3.7	20.0	A	
Ethyl ether	0.1167	0.1091			-6.5	20.0	A	
Ethyl Methacrylate	50.0000		46.8022		-6.4	20.0	L	
Ethyl tert-butyl ether	0.5687	0.6244			9.8	20.0	A	
Ethylbenzene	0.7013	0.7570			7.9	20.0	A	
Freon 113	0.2045	0.1937			-5.3	20.0	A	
Heptane	50.0000		63.9668		27.9 *	20.0	Q	
Hexachlorobutadiene	50.0000		65.4516		30.9 *	20.0	Q	
Hexachloroethane	50.0000		54.7342		9.5	20.0	Q	

Calibration Type: A=Average Response Factor, L=Linear Regression, Q=Quadratic Regression
Compounds with "Calibration Type" other than "A" are calculated as % Drift due to alternate calibration type.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date/Time: 9/27/2019 12:25

Lab File ID: 719092701.D Init. Calib. Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Init. Calib. Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

COMPOUND	RRF	RRF050	Conc. CC std	MIN RRF	%D	MAX%D	CT	
Hexane	0.4145	0.4543			9.6	20.0	A	
2-Hexanone	250		227		-9.3	20.0	L	
Iodomethane	50.0000		47.6320		-4.7	20.0	Q	
Isobutyl alcohol	500		333		-33.4 *	20.0	L	NT
Isopropyl Alcohol	250		185		-26.1 *	20.0	Q	NT
Isopropylbenzene	2.4300	2.7662			13.8	20.0	A	
p-Isopropyltoluene	50.0000		53.2283		6.5	20.0	L	
Methyl acetate	0.0324	0.0324			0.0	20.0	A	
Methyl acrylate	0.1839	0.1870			1.7	20.0	A	
Methacrylonitrile	0.0865	0.0891			3.0	20.0	A	
Methyl cyclohexane	0.8250	0.9287			12.6	20.0	A	
Methyl methacrylate	50.0000		47.4426		-5.1	20.0	L	
Methyl t-Butyl Ether	0.5175	0.5517			6.6	20.0	A	
4-Methyl-2-Pentanone(MIBK)	250		208		-16.7	20.0	L	
Methylene Chloride	50.0000		52.8276		5.7	20.0	L	
Naphthalene	50.0000		42.9041		-14.2	20.0	Q	
Nitrobenzene	500		213		-57.3 *	20.0	Q	NT
2-Nitropropane	250		219		-12.5	20.0	L	
Octane	50.0000		71.7600		43.5 *	20.0	Q	NT
Pentachloroethane	0.3796	0.4035			6.3	20.0	A	
Pentane	0.2071	0.2077			0.3	20.0	A	
n-Propanol	0.0114	0.0119			4.3	20.0	A	
Propionitrile	0.0216	0.0206			-4.3	20.0	A	
n-Propylbenzene	0.6540	0.7435			13.7	20.0	A	
Styrene	1.5576	1.7431			11.9	20.0	A	
1,1,1,2-Tetrachloroethane	0.4145	0.4573			10.3	20.0	A	
1,1,2,2-Tetrachloroethane	0.6599	0.6559		0.300	-0.6	20.0	A	
Tetrachloroethene	0.4314	0.4570			5.9	20.0	A	
Tetrahydrofuran	0.0519	0.0485			-6.7	20.0	A	
Toluene	1.2082	1.3115			8.6	20.0	A	
Total Xylenes	0.7962	0.8931			12.2	20.0	A	
1,2,3-Trichlorobenzene	50.0000		42.3883		-15.2	20.0	Q	
1,2,4-Trichlorobenzene	50.0000		48.3279		-3.3	20.0	Q	
1,1,1-Trichloroethane	0.2902	0.3147			8.5	20.0	A	
1,1,2-Trichloroethane	0.3594	0.3770			4.9	20.0	A	

Calibration Type: A=Average Response Factor, L=Linear Regression, Q=Quadratic Regression
Compounds with "Calibration Type" other than "A" are calculated as % Drift due to alternate calibration type.

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date/Time: 9/27/2019 12:25

Lab File ID: 719092701.D Init. Calib. Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Init. Calib. Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

COMPOUND	RRF	RRF050	Conc. CC std	MIN RRF	%D	MAX%D	CT
Trichloroethene	0.2428	0.2446			0.8	20.0	A
Trichlorofluoromethane	0.3593	0.3655			1.7	20.0	A
1,2,3-Trichloropropane	0.1894	0.1889			-0.3	20.0	A
1,2,4-Trimethylbenzene	1.8303	2.1250			16.1	20.0	A
1,3,5-Trimethylbenzene	1.8224	2.1093			15.7	20.0	A
Vinyl Acetate	50.0000		50.1613		0.3	20.0	Q
Vinyl Chloride	0.3070	0.3033			-1.2	20.0	A
o-Xylene	0.7659	0.8694			13.5	20.0	A
mp-Xylene	0.8113	0.9050			11.5	20.0	A
4-Bromofluorobenzene	0.5565	0.5847			5.1	20.0	A
Dibromofluoromethane	0.1845	0.1863			1.0	20.0	A
1,2-Dichloroethane-d4	0.2084	0.2037			-2.2	20.0	A
Toluene-d8	1.6530	1.6695			1.0	20.0	A

Calibration Type: A=Average Response Factor, L=Linear Regression, Q=Quadratic Regression
Compounds with "Calibration Type" other than "A" are calculated as % Drift due to alternate calibration type.

ALS Environmental Services

RECOVERY REPORT

Client Name: Client SDG: 7190927.b
Sample Matrix: LIQUID Fraction: VOA
Lab Smp Id: 1801
Level: LOW Operator: TMP
Data Type: MS DATA SampleType: LCS
SpikeList File: DODENDCCV.spk Quant Type: ISTD
Sublist File: DODall.sub
Method File: \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190927.b\7-8260b09
Misc Info:

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
1	Dichlorodifluorome	50.0000	47.1877	94.38	50-150
2	Chloromethane	50.0000	45.3770	90.75	50-150
3	Vinyl Chloride	50.0000	47.8556	95.71	50-150
4	Bromomethane	50.0000	38.4551	76.91	50-150
5	Chloroethane	50.0000	49.6457	99.29	50-150
6	Pentane	50.0000	46.7645	93.53	50-150
7	Trichlorofluoromet	50.0000	50.6235	101.25	50-150
8	Dichlorofluorometh	50.0000	46.6316	93.26	50-150
9	Ethyl Ether	50.0000	44.7047	89.41	50-150
10	1,1-Dichloroethene	50.0000	44.2906	88.58	50-150
11	Freon 113	50.0000	43.4602	86.92	50-150
12	Carbon Disulfide	50.0000	41.3247	82.65	50-150
13	Iodomethane	50.0000	34.9430	69.89	50-150
14	Acrolein	250.000	197.740	79.10	50-150
15	Isopropyl Alcohol	250.000	231.984	92.79	50-150
16	3-Chloro-1-propene	50.0000	42.1116	84.22	50-150
17	Methylene Chloride	50.0000	43.5372	87.07	50-150
18	Acetone	250.000	194.600	77.84	50-150
19	Methyl acetate	50.0000	50.3207	100.64	50-150
20	trans-1,2-Dichloro	50.0000	44.3661	88.73	50-150
21	Hexane	50.0000	50.3502	100.70	50-150
22	Methyl t-Butyl Eth	50.0000	52.1606	104.32	50-150
23	tert.- Butyl Alcoh	250.000	247.042	98.82	50-150
24	Acetonitrile	250.000	263.660	105.46	50-150
25	Diisopropyl ether	50.0000	52.2839	104.57	50-150
26	Chloroprene	50.0000	50.5003	101.00	50-150
27	1,1-Dichloroethane	50.0000	51.1825	102.36	50-150
28	Acrylonitrile	250.000	305.228	122.09	50-150
30	n-Propanol	500.000	515.013	103.00	50-150
29	Ethyl tert-butyl e	50.0000	52.2131	104.43	50-150
31	Vinyl acetate	50.0000	44.3564	88.71	50-150
32	cis-1,2-Dichloroet	50.0000	49.4263	98.85	50-150
33	2,2-Dichloropropan	50.0000	42.5581	85.12	50-150
34	Bromochloromethane	50.0000	50.8763	101.75	50-150
35	Cyclohexane	50.0000	51.7502	103.50	50-150
36	Chloroform	50.0000	49.3149	98.63	50-150
37	Ethyl acetate	50.0000	49.9287	99.86	50-150
38	Methyl acrylate	50.0000	51.9680	103.94	50-150
39	Carbon Tetrachlori	50.0000	51.2207	102.44	50-150
40	Tetrahydrofuran	250.000	259.413	103.77	50-150

SPIKE	COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
42	1,1,1-Trichloroeth	50.0000	50.3630	100.73	50-150
43	2-Butanone	250.000	260.479	104.19	50-150
44	1,1-Dichloropropen	50.0000	49.8270	99.65	50-150
45	1-Chlorobutane	50.0000	49.4507	98.90	50-150
46	Heptane	50.0000	54.3063	108.61	50-150
47	Benzene	50.0000	50.6803	101.36	50-150
48	Propionitrile	250.000	265.050	106.02	50-150
49	Methacrylonitrile	50.0000	53.2063	106.41	50-150
50	tert-amyl methyl E	50.0000	53.7648	107.53	50-150
54	Isobutyl alcohol	500.000	350.684	70.14	50-150
52	1,2-Dichloroethane	50.0000	50.3463	100.69	50-150
53	tert-Amyl Alcohol	250.000	268.619	107.45	50-150
56	Diisobutylene	50.0000	50.3258	100.65	50-150
57	Trichloroethene	50.0000	47.1808	94.36	50-150
58	Methyl cyclohexane	50.0000	52.3033	104.61	50-150
59	tert-Amyl Ethyleth	50.0000	53.0725	106.15	50-150
60	Dibromomethane	50.0000	50.6623	101.32	50-150
61	1,2-Dichloropropan	50.0000	52.4452	104.89	50-150
62	Bromodichlorometha	50.0000	53.4365	106.87	50-150
63	Methyl methacrylat	50.0000	48.2863	96.57	50-150
64	1,4-Dioxane	1250.00	450.136	36.01*	50-150
65	2-Chloroethylvinyl	50.0000	39.4100	78.82	50-150
66	cis-1,3-Dichloropr	50.0000	50.0571	100.11	50-150
67	Octane	50.0000	55.4003	110.80	50-150
69	Toluene	50.0000	49.6142	99.23	50-150
70	Chloroacetonitrile	250.000	257.747	103.10	50-150
71	2-Nitropropane	250.000	225.341	90.14	50-150
72	1,1-Dichloro-2-pro	250.000	226.131	90.45	50-150
73	4-Methyl-2-Pentano	250.000	227.502	91.00	50-150
74	Tetrachloroethene	50.0000	51.0851	102.17	50-150
75	trans-1,3-Dichloro	50.0000	50.6709	101.34	50-150
76	Ethyl methacrylate	50.0000	45.7071	91.41	50-150
77	1,1,2-Trichloroeth	50.0000	49.7161	99.43	50-150
78	Chlorodibromometha	50.0000	52.0037	104.01	50-150
80	1,2-Dibromoethane	50.0000	50.2268	100.45	50-150
81	2-Hexanone	250.000	224.864	89.95	50-150
82	1-Chlorohexane	50.0000	45.8230	91.65	50-150
79	1,3-Dichloropropan	50.0000	49.8281	99.66	50-150
84	Chlorobenzene	50.0000	48.6841	97.37	50-150
85	Ethylbenzene	50.0000	49.7589	99.52	50-150
86	1,1,1,2-Tetrachlor	50.0000	51.0227	102.05	50-150
87	mp-Xylene	100.000	103.138	103.14	50-150
88	o-Xylene	50.0000	52.7164	105.43	50-150
89	Styrene	50.0000	51.7163	103.43	50-150
90	Bromoform	50.0000	50.3952	100.79	50-150
91	Isopropylbenzene	50.0000	52.8044	105.61	50-150
93	Bromobenzene	50.0000	47.7679	95.54	50-150
94	n-Propylbenzene	50.0000	53.0011	106.00	50-150
95	1,1,2,2-Tetrachlor	50.0000	49.2090	98.42	50-150
96	o-Chlorotoluene	50.0000	50.5389	101.08	50-150
M 100	1,2-Dichloroethene	100.000	93.7924	93.79	50-150
97	1,3,5-Trimethylben	50.0000	54.0094	108.02	50-150
98	1,2,3-Trichloropro	50.0000	48.8465	97.69	50-150
99	trans-1,4-Dichloro	50.0000	40.6838	81.37	50-150

	SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
	101 p-Chlorotoluene	50.0000	50.6415	101.28	50-150
	102 tert-Butylbenzene	50.0000	52.9894	105.98	50-150
	103 Pentachloroethane	50.0000	46.4476	92.90	50-150
	104 1,2,4-Trimethylben	50.0000	54.1024	108.20	50-150
	105 sec-Butylbenzene	50.0000	55.4762	110.95	50-150
	106 p-Isopropyltoluene	50.0000	48.8530	97.71	50-150
	107 1,3-Dichlorobenzen	50.0000	49.1044	98.21	50-150
	109 1,4-Dichlorobenzen	50.0000	46.5334	93.07	50-150
	110 Benzyl Chloride	50.0000	36.2379	72.48	50-150
	111 n-Butylbenzene	50.0000	53.0139	106.03	50-150
	112 Hexachloroethane	50.0000	50.4429	100.89	50-150
	113 1,2-Dichlorobenzen	50.0000	49.6120	99.22	50-150
	114 1,2-Dibromo-3-chlo	50.0000	45.1864	90.37	50-150
	115 Nitrobenzene	500.000	117.085	23.42*	50-150
	116 Hexachlorobutadien	50.0000	57.4080	114.82	50-150
	117 1,2,4-Trichloroben	50.0000	46.5214	93.04	50-150
	118 Naphthalene	50.0000	43.5883	87.18	50-150
M	120 1,3-Dichloropropen	100.000	100.728	100.73	50-150
	119 1,2,3-Trichloroben	50.0000	44.8782	89.76	50-150
M	121 TOTAL XYLENES	150.000	155.854	103.90	50-150

	SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$	41 Dibromofluorometha	49.9980	48.4687	96.94	80-119
$	51 1,2-Dichloroethane	49.9980	47.7458	95.50	81-118
$	68 Toluene-d8	49.9980	47.4731	94.95	89-112
$	92 4-Bromofluorobenze	49.9980	49.1331	98.27	85-114

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.

3018649

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG NO.: EPR-031

Lab File ID: 719092705.D Lab Sample ID: 3018649

Date Analyzed: 9/27/2019 Time Analyzed: 15:20

GC Column: RTXVRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: ms07.i

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
3018650(LCS)	3018650	719092702.D	13:37
03TB04-20190920	3059275001	719092711.D	17:38
03MW03SI-20190920	3059275002	719092719.D	20:38
03MW03I-20190920	3059275003	719092720.D	21:01
03MW04I-20190920	3059275004	719092721.D	21:23
03DUP02-20190920	3059275005	719092722.D	21:46

COMMENTS:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3018649(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3018649

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092705.D

Level (low/med): Date Received: 9/27/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
67-64-1	Acetone	3.8	U
71-43-2	Benzene	0.75	U
74-97-5	Bromochloromethane	0.75	U
75-27-4	Bromodichloromethane	0.75	U
75-25-2	Bromoform	0.75	U
74-83-9	Bromomethane	0.75	U
78-93-3	2-Butanone	3.8	U
75-15-0	Carbon Disulfide	0.75	U
56-23-5	Carbon Tetrachloride	0.75	U
108-90-7	Chlorobenzene	0.75	U
124-48-1	Chlorodibromomethane	0.75	U
75-00-3	Chloroethane	0.75	U
67-66-3	Chloroform	0.75	U
74-87-3	Chloromethane	0.75	U
110-82-7	Cyclohexane	0.75	U
96-12-8	1,2-Dibromo-3-Chloropropane	2.5	U
106-93-4	1,2-Dibromoethane	0.75	U
95-50-1	1,2-Dichlorobenzene	0.75	U
541-73-1	1,3-Dichlorobenzene	0.75	U
106-46-7	1,4-Dichlorobenzene	0.75	U
75-71-8	Dichlorodifluoromethane	0.75	U
75-34-3	1,1-Dichloroethane	0.75	U
107-06-2	1,2-Dichloroethane	0.75	U
75-35-4	1,1-Dichloroethene	0.75	U
156-59-2	cis-1,2-Dichloroethene	0.75	U
156-60-5	trans-1,2-Dichloroethene	0.75	U
78-87-5	1,2-Dichloropropane	0.75	U
10061-01-5	cis-1,3-Dichloropropene	0.75	U
10061-02-6	trans-1,3-Dichloropropene	0.75	U
123-91-1	1,4-Dioxane	73.7	
100-41-4	Ethylbenzene	0.75	U
76-13-1	Freon 113	0.75	U
591-78-6	2-Hexanone	3.8	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

3018649(MB)

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3018649

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092705.D

Level (low/med): Date Received: 9/27/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	0.75	U
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Laboratory Control Spike - Sample No: 3018650

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Acetone	100		105	105	(39-160)
Benzene	20		20.9	105	(79-120)
Bromochloromethane	20		21.0	105	(78-123)
Bromodichloromethane	20		21.4	107	(79-125)
Bromoform	20		20.3	101	(66-130)
Bromomethane	20		17.3	86.6	(53-141)
2-Butanone	100		89.2	89.2	(56-143)
Carbon Disulfide	20		20.9	104	(64-133)
Carbon Tetrachloride	20		22.0	110	(72-136)
Chlorobenzene	20		19.7	98.4	(82-118)
Chlorodibromomethane	20		20.5	103	(74-126)
Chloroethane	20		20.2	101	(60-138)
Chloroform	20		20.4	102	(79-124)
Chloromethane	20		19.5	97.6	(50-139)
Cyclohexane	20		21.9	110	(71-130)
1,2-Dibromo-3-Chloropro	20		17.1	85.5	(62-128)
1,2-Dibromoethane	20		20.2	101	(77-121)
1,2-Dichlorobenzene	20		19.9	99.4	(80-119)
1,3-Dichlorobenzene	20		19.9	99.6	(80-119)
1,4-Dichlorobenzene	20		19.4	96.9	(79-118)
Dichlorodifluoromethane	20		18.7	93.5	(32-152)
1,1-Dichloroethane	20		22.7	113	(77-125)
1,2-Dichloroethane	20		20.8	104	(73-128)
1,1-Dichloroethene	20		25.9	129	(71-131)
cis-1,2-Dichloroethene	20		20.6	103	(78-123)
trans-1,2-Dichloroethen	20		23.7	119	(75-124)
1,2-Dichloropropane	20		20.9	105	(78-122)
cis-1,3-Dichloropropene	20		20.8	104	(75-124)
trans-1,3-Dichloroprope	20		21.0	105	(73-127)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 2 out of 51 outside limits

Comments:

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Laboratory Control Spike - Sample No: 3018650

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
1,4-Dioxane	500		1590	318*	(59-139)
Ethylbenzene	20		19.6	98	(79-121)
Freon 113	20		19.7	98.7	(70-136)
2-Hexanone	100		86.0	86	(57-139)
Isopropylbenzene	20		21.6	108	(72-131)
Methyl acetate	20		21.5	108	(56-136)
Methyl cyclohexane	20		21.3	107	(72-132)
Methyl t-Butyl Ether	20		21.1	106	(71-124)
4-Methyl-2-Pentanone(MI	100		81.8	81.8	(67-130)
Methylene Chloride	20		22.2	111	(74-124)
Styrene	20		21.0	105	(78-123)
1,1,2,2-Tetrachloroetha	20		19.3	96.6	(71-121)
Tetrachloroethene	20		20.5	103	(74-129)
Toluene	20		20.3	101	(80-121)
Total Xylenes	60		61.8	103	(79-121)
1,2,3-Trichlorobenzene	20		13.0	64.8*	(69-129)
1,2,4-Trichlorobenzene	20		15.7	78.3	(69-130)
1,1,1-Trichloroethane	20		22.3	111	(74-131)
1,1,2-Trichloroethane	20		19.7	98.3	(80-119)
Trichloroethene	20		19.6	98.1	(79-123)
Trichlorofluoromethane	20		20.5	103	(65-141)
Vinyl Chloride	20		20.3	101	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 2 out of 51 outside limits

Comments:

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: EPR-031

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
01	3017576(LCS)	108	99.3	98.2	97.7	0

	QC LIMITS
SMC1 (BFB) = 4-Bromofluorobenzene	(76-119)
SMC2 (DBFM) = Dibromofluoromethane	(85-115)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(72-119)
SMC4 (TOL) = Toluene-d8	(81-120)

Column to be used to flag recovery values

* Values outside of contract required QC Limits

D Surrogate Diluted Out

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA CASE No.: SAS No.: SDG NO.: EPR-031

	Sample NO.	SMC1 (BFB) #	SMC2 (DBFM)	SMC3 (DCE) #	SMC4 (TOL) #	TOT OUT
02	3018650(LCS)	109	98.9	104	98.0	0
03	3018649(MB)	111	100	104	100	0
04	03TB04-20190920	112	101	106	101	0
05	03MW03SI-20190920	112	98.5	103	99.0	0
06	03MW03I-20190920	114	101	104	99.6	0
07	03MW04I-20190920	114	98.3	104	99.4	0
08	03DUP02-20190920	113	98.4	103	99.0	0

	QC LIMITS
SMC1 (BFB) = 4-Bromofluorobenzene	(85-114)
SMC2 (DBFM) = Dibromofluoromethane	(80-119)
SMC3 (DCE) = 1,2-Dichloroethane-d4	(81-118)
SMC4 (TOL) = Toluene-d8	(89-112)

Column to be used to flag recovery values

* Values outside of contract required QC Limits

D Surrogate Diluted Out

8Az

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Lab File ID: 719092607.D Date Analyzed: 9/27/2019

Instrument ID: ms07.i Time Analyzed: 01:17

GC Column: RTXVRX ID: 0.2 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT#	IS2 AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	883686	6.053	715389	7.822	2024453	4.061
UPPER LIMIT	1767372	6.223	1430778	7.992	4048906	4.231
LOWER LIMIT	441843	5.883	357695	7.652	1012227	3.891
SAMPLE NO.						
3017576(LCS)	906591	6.053	704814	7.824	2043412	4.061

IS1 = Chlorobenzene-d5
IS2 = 1,4-Dichlorobenzene-d4
IS3 = Fluorobenzene

AREA UPPER LIMIT = +2% of internal standard area
AREA LOWER LIMIT = -1% of internal standard area
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8Az

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Lab File ID: 719092701.D Date Analyzed: 9/27/2019

Instrument ID: ms07.i Time Analyzed: 12:25

GC Column: RTXVRX ID: 0.2 (mm) Heated Purge: (Y/N) N

	IS1 AREA #	RT#	IS2 AREA #	RT #	IS3 AREA #	RT #
12 HOUR STD	883686	6.056	715389	7.825	2024453	4.061
UPPER LIMIT	1767372	6.226	1430778	7.995	4048906	4.231
LOWER LIMIT	441843	5.886	357695	7.655	1012227	3.891
SAMPLE NO.						
1800	873858	6.056	707733	7.825	1987553	4.061
3018650(LCS)	908910	6.053	708992	7.825	2051458	4.061
3018649(MB)	826281	6.056	619124	7.825	1939049	4.061
03TB04-20190920	788859	6.056	582994	7.825	1847528	4.061
03MW03SI-20190920	772043	6.056	549882	7.825	1800168	4.061
03MW03I-20190920	767002	6.056	545283	7.825	1788425	4.061
03MW04I-20190920	762087	6.056	537635	7.825	1784632	4.061
03DUP02-20190920	755153	6.056	536451	7.825	1754098	4.061
1801	835826	6.053	678242	7.825	1852349	4.061

IS1 = Chlorobenzene-d5
IS2 = 1,4-Dichlorobenzene-d4
IS3 = Fluorobenzene

AREA UPPER LIMIT = +2% of internal standard area
AREA LOWER LIMIT = -1% of internal standard area
RT UPPER LIMIT = +0.17 minutes of internal standard RT
RT LOWER LIMIT = -0.17 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

Data File: \\GC01\TargetData\Chem2\ms07.i\7-2019\7190926.b

GCMS ANALYSIS - VOLATILE ORGANICS

DATE(S):	9/26/2019	Analyst:	PDK				
DATA FILE:	7190926xx.d	BFB INJ :	9/26/19 22:31	INSTRUMENT: MS07	METHOD(S)	8260W	D8260W	8260W_C
BATCH:	7190926.b	12-HOUR ENDING:	9/27/19 10:31	ICAL DATE: 9/26/2019	LIMS BATCH:		52445	

Pos #	Run #	ALS Sample ID (w/ Container ID)	Dilution	Test	pH	HDSP / Wt.	CL-	Comment	Pos #	Run #	ALS Sample ID (w/ Container ID)	Dilution	Test	pH	HDSP / Wt.	CL-	Comment
0	00	1000	1	BFB	-	-	-		32	33							
1	01	WP	1	8260	-	-	-		33	34							
2	02	WP	1	8260	-	-	-		34	35							
3	03	VSTD00.5	1	8260	-	-	-		35	36							
4	04	1234	1	8260	-	-	-		36	37							
5	05	1235	1	8260	-	-	-		37	38							
6	06	1236	1	8260	-	-	-		38	39							
7	07	1237	1	8260	-	-	-		39	40							
8	08	1238	1	8260	-	-	-		40	41							
9	09	1239	1	8260	-	-	-		41	42							
10	10	WP	1	8260	-	-	-		42	43							
11	11	WP	1	8260	-	-	-		43	44							
12	12	3017576	1	8260	-	-	-		44	45							
13	13	WP	1	8260	-	-	-		45	46							
14	14	WP	1	8260	-	-	-		46	47							
15	15	WP	1	8260	-	-	-		47	48							
16	16	3017575	1	8260	-	-	-		48	49							
17	17	3059231007-A	1	D8260W V	<2	N	N		49	50							
18	18	3059461001-A	1	D8260W V	<2	N	N	SS	50	51							
19	19	3059231003-A	1	D8260W V	<2	N	N		51	52							
20	20	3059231004-A	1	D8260W V	<2	N	N		52	53							
21	21	3059231005-A	1	D8260W V	<2	N	N	SS	53	54							
22	22	3059231006-A	1	D8260W V	<2	N	N		54	55							
23	23	3059461002-A	1	D8260W V	<2	N	N		55	56							
24	24	3059461003-A	1	D8260W V	<2	N	N		56	57							
25	25	3059461004-A	1	D8260W V	<2	N	N	SS	57	58							
26	26	3059027001-B	20	TCLP	-	-	-	AF SS	58	59							
27	27	1801	1	D8260W	-	-	-		59	60							
28	28								60	61							
29	29								61	62							
30	30								62	63							
31	31								63	64							
32	32								64	65							

IS:	VOA14-67-01	Vnew:	VOA14-70-06
SS:	VOA14-60-01	Vgas:	VOA14-71-16
BFB:	VOA14-53-16	Qvoa:	VOA14-69-01
1-4DIOX		Qgas:	VOA14-71-01
524IS/SS			

ABBREVIATIONS

CO:	Suspect Carryover	SS:	Surrogate Failure
LS:	Library Search	IS:	ISTD Failure
RR:	Rerun same dilution	DNR:	Do not Report
DFx:	Rerun @ less diln x	NU:	Not Used
DLx:	Rerun @ diln x	AF:	Antifoam was used

Prev		Prev	
Current		Current	
Total		Total	
Needs QC?		Needs QC?	

Data File: \\GC01\TargetData\Chem2\ms07.i\7-2019\7190927.b

GCMS ANALYSIS - VOLATILE ORGANICS

DATE(S):	9/27/2019	Analyst:	TMP				
DATA FILE:	7190927xx.d	BFB INJ :	9/27/19 11:57	INSTRUMENT: MS07	METHOD(S)	8260W	D8260W	8260W_C
BATCH:	7190927.b	12-HOUR ENDING:	9/27/19 23:57	ICAL DATE: 9/26/2019	LIMS BATCH:		52473	

Pos #	Run #	ALS Sample ID (w/ Container ID)	Dilution	Test	pH	HDSP / Wt.	CL-	Comment	Pos #	Run #	ALS Sample ID (w/ Container ID)	Dilution	Test	pH	HDSP / Wt.	CL-	Comment
0	00	1000	1	BFB	-	-	-		32	33							
1	01	1800	1	8260	-	-	-		33	34							
2	02	3018650	1	8260	-	-	-		34	35							
3	03	WP	1	8260	-	-	-		35	36							
4	04	WP	1	8260	-	-	-		36	37							
5	05	3018649	1	8260	-	-	-		37	38							
6	06	3054131022	1	8260	-	-	-	LOD/LOQ	38	39							
7	07	3054131028	1	8260	-	-	-	LOD/LOQ	39	40							
8	08	3054131025	1	8260	-	-	-	LOD/LOQ	40	41							
9	09	3054131031	1	8260	-	-	-	LOD/LOQ	41	42							
10	10	3058472002-A	1	D8260W V	<2	N	N		42	43							
11	11	3059275001-A	1	D8260W V	<2	N	N		43	44							
12	12	3059166004-B	1	D8260W V	<2	N	N	(RR) SS	44	45							
13	13	3059166005-B	1	D8260W V	<2	N	N	(RR)	45	46							
14	14	3059461005-A	1	D8260W V	<2	N	N		46	47							
15	15	3059461006-A	1	D8260W V	<2	N	N	SS RR1X	47	48							
16	16	3059461007-A	1	D8260W V	<2	N	N		48	49							
17	17	3059461008-A	1	D8260W V	<2	N	N	SS RR1X	49	50							
18	18	3059461009-A	1	D8260W V	<2	N	N	SS RR1X	50	51							
19	19	3059275002-A	1	D8260W V	<2	N	N		51	52							
20	20	3059275003-A	1	D8260W V	<2	N	N		52	53							
21	21	3059275004-A	1	D8260W V	<2	N	N		53	54							
22	22	3059275005-A	1	D8260W V	<2	N	N		54	55							
23	23	1801	1	D8260W V	-	-	-		55	56							
24	24								56	57							
25	25								57	58							
26	26								58	59							
27	27								59	60							
28	28								60	61							
29	29								61	62							
30	30								62	63							
31	31								63	64							
32	32								64	65							

IS:	VOA14-67-01	Vnew:	VOA14-70-06
SS:	VOA14-60-01	Vgas:	VOA14-71-16
BFB:	VOA14-53-16	Qvoa:	VOA14-69-01
1-4DIOX		Qgas:	VOA14-71-01
524IS/SS			

ABBREVIATIONS

CO:	Suspect Carryover	SS:	Surrogate Failure
LS:	Library Search	IS:	ISTD Failure
RR:	Rerun same dilution	DNR:	Do not Report
DFx:	Rerun @ less diln x	NU:	Not Used
DLx:	Rerun @ diln x	AF:	Antifoam was used

Prev		Prev	
Current		Current	
Total		Total	
Needs QC?		Needs QC?	

Total Metals by Method 6020 Summary Forms

6020 3015 DOD

- COVER PAGE -

INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc.

SDG No.: EPR-031 **Method Type:** 6020 3015 DOD **SOW No.:**

Contract: EPR031|Willow Grove **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
3059275002	03MW03SI-20190920	
3059275003	03MW03I-20190920	
3059275004	03MW04I-20190920	
3059275005	03DUP02-20190920	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **Matthew Olley**

Date: Title: **Metals Supervisor**

6020 3015 DOD

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-031

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092619D 030

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	0306																									
BLK	1.00	0309		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
STANDARD 5	1.00	0312		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0316																									
ZZZZZZ	1.00	0319																									
ICB	1.00	0322		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
LLICV	1.00	0325		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0333																									
ICV	1.00	0337		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0340																									
ICSAB	1.00	0343		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0347																									
ZZZZZZ	1.00	0350																									
ICSA	1.00	0353		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0356																									
MB for HBN 544196 [	1.00	0403		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
LCS for HBN 544196 [	1.00	0406		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0409																									
ZZZZZZ	1.00	0413																									
ZZZZZZ	1.00	0416																									
ZZZZZZ	1.00	0419																									
ZZZZZZ	1.00	0422																									
ZZZZZZ	1.00	0426																									
ZZZZZZ	1.00	0429																									
ZZZZZZ	1.00	0432																									
CCV	1.00	0436		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
CCB	1.00	0439		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0443																									
ZZZZZZ	1.00	0446																									
ZZZZZZ	1.00	0450																									
ZZZZZZ	1.00	0453																									
ZZZZZZ	1.00	0456																									
ZZZZZZ	1.00	0500																									
ZZZZZZ	1.00	0503																									
03MW03SI-20190920	1.00	0506		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03MW03I-20190920	1.00	0510		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		

6020 3015 DOD

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-031

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092619D 030

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																									
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
03MW04I-20190920	1.00	0513		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0516																									
CCB	1.00	0519		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0524																									
CCV	1.00	0527		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
03DUP02-20190920	1.00	0530		X	X			X	X	X	X	X			X	X	X		X	X		X	X	X	X		
ZZZZZZ	1.00	0534																									
ZZZZZZ	1.00	0537																									
ZZZZZZ	1.00	0540																									
ZZZZZZ	1.00	0544																									
ZZZZZZ	1.00	0550																									
ZZZZZZ	1.00	0555																									
CCV	1.00	0558		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		
CCB	1.00	0601		X	X		X	X	X	X	X	X			X	X	X		X	X		X	X	X	X		

6020 3015 DOD

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
LLICV										
	Aluminum	0.0767	0.0800	96		80 - 120	M	9/26/2019	03:25	A092619D 0
	Antimony	0.0021	0.0020	105		80 - 120	M	9/26/2019	03:25	A092619D 0
	Barium	0.0053	0.0050	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Beryllium	0.0011	0.0010	110		80 - 120	M	9/26/2019	03:25	A092619D 0
	Cadmium	0.0011	0.0010	110		80 - 120	M	9/26/2019	03:25	A092619D 0
	Calcium	0.1094	0.1000	109		80 - 120	M	9/26/2019	03:25	A092619D 0
	Chromium	0.0017	0.0020	85		80 - 120	M	9/26/2019	03:25	A092619D 0
	Cobalt	0.0049	0.0050	98		80 - 120	M	9/26/2019	03:25	A092619D 0
	Lead	0.0021	0.0020	105		80 - 120	M	9/26/2019	03:25	A092619D 0
	Magnesium	0.1073	0.1000	107		80 - 120	M	9/26/2019	03:25	A092619D 0
	Manganese	0.0052	0.0050	104		80 - 120	M	9/26/2019	03:25	A092619D 0
	Nickel	0.0053	0.0050	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Potassium	0.1161	0.1000	116		80 - 120	M	9/26/2019	03:25	A092619D 0
	Silver	0.0019	0.0020	95		80 - 120	M	9/26/2019	03:25	A092619D 0
	Sodium	0.1058	0.1000	106		80 - 120	M	9/26/2019	03:25	A092619D 0
	Thallium	0.0010	0.0010	100		80 - 120	M	9/26/2019	03:25	A092619D 0
	Vanadium	0.0018	0.0020	90		80 - 120	M	9/26/2019	03:25	A092619D 0
ICV										
	Aluminum	0.1007	0.1000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Antimony	0.0977	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Barium	0.1005	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Beryllium	0.1037	0.1000	104		90 - 110	M	9/26/2019	03:37	A092619D 0
	Cadmium	0.0996	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Calcium	1.0176	1.0000	102		90 - 110	M	9/26/2019	03:37	A092619D 0
	Chromium	0.1026	0.1000	103		90 - 110	M	9/26/2019	03:37	A092619D 0
	Cobalt	0.0981	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Lead	0.1007	0.1000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Magnesium	1.0453	1.0000	105		90 - 110	M	9/26/2019	03:37	A092619D 0
	Manganese	0.1062	0.1000	106		90 - 110	M	9/26/2019	03:37	A092619D 0
	Nickel	0.1060	0.1000	106		90 - 110	M	9/26/2019	03:37	A092619D 0
	Potassium	1.0438	1.0000	104		90 - 110	M	9/26/2019	03:37	A092619D 0
	Silver	0.1000	0.1000	100		90 - 110	M	9/26/2019	03:37	A092619D 0
	Sodium	1.0114	1.0000	101		90 - 110	M	9/26/2019	03:37	A092619D 0
	Thallium	0.0978	0.1000	98		90 - 110	M	9/26/2019	03:37	A092619D 0
	Vanadium	0.1019	0.1000	102		90 - 110	M	9/26/2019	03:37	A092619D 0

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Aluminum	0.0944	0.1000	94		90 - 110	M	9/26/2019	04:36	A092619D 0
	Antimony	0.0949	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Barium	0.0970	0.1000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Beryllium	0.0948	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Cadmium	0.0958	0.1000	96		90 - 110	M	9/26/2019	04:36	A092619D 0
	Calcium	0.9715	1.0000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Chromium	0.0978	0.1000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Cobalt	0.0929	0.1000	93		90 - 110	M	9/26/2019	04:36	A092619D 0
	Lead	0.0991	0.1000	99		90 - 110	M	9/26/2019	04:36	A092619D 0
	Magnesium	1.0281	1.0000	103		90 - 110	M	9/26/2019	04:36	A092619D 0
	Manganese	0.1016	0.1000	102		90 - 110	M	9/26/2019	04:36	A092619D 0
	Nickel	0.0977	0.1000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Potassium	1.0167	1.0000	102		90 - 110	M	9/26/2019	04:36	A092619D 0
	Silver	0.0972	0.1000	97		90 - 110	M	9/26/2019	04:36	A092619D 0
	Sodium	0.9842	1.0000	98		90 - 110	M	9/26/2019	04:36	A092619D 0
	Thallium	0.0952	0.1000	95		90 - 110	M	9/26/2019	04:36	A092619D 0
	Vanadium	0.0964	0.1000	96		90 - 110	M	9/26/2019	04:36	A092619D 0

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
CCV										
	Aluminum	0.0992	0.1000	99		90 - 110	M	9/26/2019	05:27	A092619D 0
	Antimony	0.1009	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Barium	0.1013	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Beryllium	0.1021	0.1000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Cadmium	0.1007	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Calcium	1.0175	1.0000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Chromium	0.1012	0.1000	101		90 - 110	M	9/26/2019	05:27	A092619D 0
	Cobalt	0.0960	0.1000	96		90 - 110	M	9/26/2019	05:27	A092619D 0
	Lead	0.1021	0.1000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Magnesium	1.0438	1.0000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Manganese	0.1042	0.1000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Nickel	0.1036	0.1000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Potassium	1.0401	1.0000	104		90 - 110	M	9/26/2019	05:27	A092619D 0
	Silver	0.1004	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
	Sodium	1.0210	1.0000	102		90 - 110	M	9/26/2019	05:27	A092619D 0
	Thallium	0.0998	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
	Vanadium	0.1003	0.1000	100		90 - 110	M	9/26/2019	05:27	A092619D 0
CCV										
	Aluminum	0.0971	0.1000	97		90 - 110	M	9/26/2019	05:58	A092619D 0
	Antimony	0.0972	0.1000	97		90 - 110	M	9/26/2019	05:58	A092619D 0
	Barium	0.0994	0.1000	99		90 - 110	M	9/26/2019	05:58	A092619D 0
	Beryllium	0.0991	0.1000	99		90 - 110	M	9/26/2019	05:58	A092619D 0
	Cadmium	0.0970	0.1000	97		90 - 110	M	9/26/2019	05:58	A092619D 0
	Calcium	0.9675	1.0000	97		90 - 110	M	9/26/2019	05:58	A092619D 0
	Chromium	0.0987	0.1000	99		90 - 110	M	9/26/2019	05:58	A092619D 0
	Cobalt	0.0946	0.1000	95		90 - 110	M	9/26/2019	05:58	A092619D 0
	Lead	0.1010	0.1000	101		90 - 110	M	9/26/2019	05:58	A092619D 0
	Magnesium	1.0154	1.0000	102		90 - 110	M	9/26/2019	05:58	A092619D 0
	Manganese	0.1013	0.1000	101		90 - 110	M	9/26/2019	05:58	A092619D 0
	Nickel	0.1020	0.1000	102		90 - 110	M	9/26/2019	05:58	A092619D 0
	Potassium	1.0192	1.0000	102		90 - 110	M	9/26/2019	05:58	A092619D 0
	Silver	0.0979	0.1000	98		90 - 110	M	9/26/2019	05:58	A092619D 0
	Sodium	0.9832	1.0000	98		90 - 110	M	9/26/2019	05:58	A092619D 0
	Thallium	0.0979	0.1000	98		90 - 110	M	9/26/2019	05:58	A092619D 0
	Vanadium	0.0980	0.1000	98		90 - 110	M	9/26/2019	05:58	A092619D 0

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	04:39	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	04:39	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	04:39	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	04:39	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	04:39	A092619D 030
	Thallium	0.0005	J	0.00066	0.0003	0.0010	M	9/26/2019	04:39	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	04:39	A092619D 030

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	05:19	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	05:19	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	05:19	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	05:19	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	05:19	A092619D 030
	Thallium	0.0003	J	0.00066	0.0003	0.0010	M	9/26/2019	05:19	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	05:19	A092619D 030

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	06:01	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	06:01	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	06:01	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	06:01	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	06:01	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	06:01	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	06:01	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	06:01	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	06:01	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	06:01	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	06:01	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	06:01	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	06:01	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	06:01	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	06:01	A092619D 030
	Thallium	0.0003	J	0.00066	0.0003	0.0010	M	9/26/2019	06:01	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	06:01	A092619D 030
ICB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	00:11	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	00:11	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	00:11	A092719 2355 (
CCB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	01:40	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	01:40	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	01:40	A092719 2355 (

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-031

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092719 2355

Start Date: 9/26/2019 End Date: 9/27/2019

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	2355																												
BLK	1.00	2358				X	X						X	X							X					X				
STANDARD 5	1.00	0002				X	X						X	X							X					X				
ICV	1.00	0005				X	X						X	X							X					X				
ZZZZZZ	1.00	0008																												
ICB	1.00	0011				X	X						X	X							X					X				
LLICV	1.00	0015				X	X						X	X							X					X				
ICSA	1.00	0028				X	X						X	X							X					X				
ICSAB	1.00	0031				X	X						X	X							X					X				
ZZZZZZ	1.00	0034																												
ZZZZZZ	1.00	0046																												
ZZZZZZ	1.00	0049																												
ZZZZZZ	1.00	0058																												
MB for HBN 544196 [	1.00	0104				X							X	X							X									
LCS for HBN 544196 [	1.00	0107				X							X	X							X					X				
ZZZZZZ	1.00	0111																												
ZZZZZZ	1.00	0114																												
ZZZZZZ	1.00	0117																												
ZZZZZZ	1.00	0120																												
ZZZZZZ	1.00	0124																												
ZZZZZZ	1.00	0127																												
ZZZZZZ	1.00	0130																												
ZZZZZZ	1.00	0133																												
CCV	1.00	0137				X	X						X	X							X					X				
CCB	1.00	0140				X	X						X	X							X					X				
ZZZZZZ	1.00	0148																												
ZZZZZZ	1.00	0151																												
ZZZZZZ	1.00	0155																												
ZZZZZZ	1.00	0158																												
ZZZZZZ	1.00	0201																												
ZZZZZZ	1.00	0205																												
03MW03SI-20190920	1.00	0208				X	X						X	X							X					X				
03MW03I-20190920	1.00	0211				X	X						X	X							X					X				
03MW04I-20190920	1.00	0214				X	X						X	X							X					X				
03DUP02-20190920	1.00	0218				X	X						X	X							X					X				
CCV	1.00	0221				X	X						X	X							X					X				

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ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-031

Instrument ID Number: AGILENT 7700 ICPMS Method: M Run Number: A092719 2355

Start Date: 9/26/2019 End Date: 9/27/2019

EPA Sample No.	D/F	Time	% R	Analytes																										
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
CCB	1.00	0224				X	X						X	X							X					X	
ZZZZZZ	1.00	0228																									
ZZZZZZ	1.00	0231																									
ZZZZZZ	1.00	0236																									
ZZZZZZ	1.00	0239																									
ZZZZZZ	1.00	0245																									
ZZZZZZ	10.00	0251																									
MB for HBN 544196 [	1.00	0254																							X	
CCV	1.00	0258																							X	
CCB	1.00	0301																							X	

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: Inorganic Ventures

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
ICV										
	Arsenic	0.1044	0.1000	104		90 - 110	M	9/27/2019	00:05	A092719 23
	Barium	0.0959	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Copper	0.0960	0.1000	96		90 - 110	M	9/27/2019	00:05	A092719 23
	Iron	0.9528	1.0000	95		90 - 110	M	9/27/2019	00:05	A092719 23
	Selenium	0.1021	0.1000	102		90 - 110	M	9/27/2019	00:05	A092719 23
	Zinc	0.0938	0.1000	94		90 - 110	M	9/27/2019	00:05	A092719 23
LLICV										
	Arsenic	0.0030	0.0030	100		80 - 120	M	9/27/2019	00:15	A092719 23
	Barium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Copper	0.0047	0.0050	94		80 - 120	M	9/27/2019	00:15	A092719 23
	Iron	0.0428	0.0500	86		80 - 120	M	9/27/2019	00:15	A092719 23
	Selenium	0.0049	0.0050	98		80 - 120	M	9/27/2019	00:15	A092719 23
	Zinc	0.0053	0.0050	106		80 - 120	M	9/27/2019	00:15	A092719 23
CCV										
	Arsenic	0.1037	0.1000	104		90 - 110	M	9/27/2019	01:37	A092719 23
	Barium	0.0957	0.1000	96		90 - 110	M	9/27/2019	01:37	A092719 23
	Copper	0.0944	0.1000	94		90 - 110	M	9/27/2019	01:37	A092719 23
	Iron	0.9482	1.0000	95		90 - 110	M	9/27/2019	01:37	A092719 23
	Selenium	0.1003	0.1000	100		90 - 110	M	9/27/2019	01:37	A092719 23
	Zinc	0.0950	0.1000	95		90 - 110	M	9/27/2019	01:37	A092719 23
CCV										
	Arsenic	0.1049	0.1000	105		90 - 110	M	9/27/2019	02:21	A092719 23
	Barium	0.0976	0.1000	98		90 - 110	M	9/27/2019	02:21	A092719 23
	Copper	0.0979	0.1000	98		90 - 110	M	9/27/2019	02:21	A092719 23
	Iron	0.9465	1.0000	95		90 - 110	M	9/27/2019	02:21	A092719 23
	Selenium	0.1006	0.1000	101		90 - 110	M	9/27/2019	02:21	A092719 23
	Zinc	0.0977	0.1000	98		90 - 110	M	9/27/2019	02:21	A092719 23
CCV										
	Zinc	0.0970	0.1000	97		90 - 110	M	9/27/2019	02:58	A092719 23

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB										
	Aluminum	0.0800	U	0.066	0.0300	0.0800	M	9/26/2019	03:22	A092619D 030
	Antimony	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Beryllium	0.001000	U	0.00066	0.000300	0.001000	M	9/26/2019	03:22	A092619D 030
	Cadmium	0.0010	U	0.00088	0.0004	0.0010	M	9/26/2019	03:22	A092619D 030
	Calcium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Chromium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Cobalt	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Lead	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Magnesium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Manganese	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Nickel	0.0050	U	0.0042	0.0019	0.0050	M	9/26/2019	03:22	A092619D 030
	Potassium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Silver	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030
	Sodium	0.1000	U	0.081	0.0370	0.1000	M	9/26/2019	03:22	A092619D 030
	Thallium	0.0010	U	0.00066	0.0003	0.0010	M	9/26/2019	03:22	A092619D 030
	Vanadium	0.0020	U	0.0015	0.0007	0.0020	M	9/26/2019	03:22	A092619D 030

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INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
CCB										
	Arsenic	0.0030	U	0.0022	0.0010	0.0030	M	9/27/2019	02:24	A092719 2355 (
	Barium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
	Copper	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
	Iron	0.0500	U	0.042	0.0190	0.0500	M	9/27/2019	02:24	A092719 2355 (
	Selenium	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	02:24	A092719 2355 (
CCB										
	Zinc	0.0050	U	0.0042	0.0019	0.0050	M	9/27/2019	03:01	A092719 2355 (

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SAMPLE PREPARATION SUMMARY

Client: Earth Toxics Inc.

SDG No.: EPR-031

Contract: EPR031|Willow Grove Sites **Lab Code:** ALS
3 &

Method: MS

Case No.: WE04 **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	544196						
3017605	MB for HBN 544196 [MDIG/8007	MB	QC-WAT	9/25/19	45.0	50.0	
3017606	LCS for HBN 544196 [MDIG/8007	LCS	QC-WAT	9/25/19	45.0	50.0	
3059275002	03MW03SI-20190920	SAM	WATER	9/25/19	45.0	50.0	
3059275003	03MW03I-20190920	SAM	WATER	9/25/19	45.0	50.0	
3059275004	03MW04I-20190920	SAM	WATER	9/25/19	45.0	50.0	
3059275005	03DUP02-20190920	SAM	WATER	9/25/19	45.0	50.0	

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PREPARATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result (mg/L)	Conc Qual	Q	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
3017605			**QC-WATER**								
	Aluminum	0.0889	U		0.044	0.0300	0.0889	M	9/26/2019	04:03	A092619D 030
	Antimony	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 030
	Arsenic	0.00333	U		0.0017	0.00100	0.00333	M	9/27/2019	01:04	A092719 2355 (
	Barium	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 030
	Beryllium	0.001111	U		0.0006	0.000300	0.001111	M	9/26/2019	04:03	A092619D 030
	Cadmium	0.00111	U		0.0006	0.00037	0.00111	M	9/26/2019	04:03	A092619D 030
	Calcium	0.1111	U		0.056	0.0370	0.1111	M	9/26/2019	04:03	A092619D 030
	Chromium	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 030
	Cobalt	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 030
	Copper	0.00282	J		0.0028	0.00185	0.00556	M	9/27/2019	01:04	A092719 2355 (
	Iron	0.05556	U		0.028	0.01900	0.05556	M	9/27/2019	01:04	A092719 2355 (
	Lead	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 030
	Magnesium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 030
	Manganese	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 030
	Nickel	0.00556	U		0.0028	0.00190	0.00556	M	9/26/2019	04:03	A092619D 030
	Potassium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 030
	Selenium	0.00556	U		0.0028	0.00190	0.00556	M	9/27/2019	01:04	A092719 2355 (
	Silver	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 030
	Sodium	0.11111	U		0.056	0.03700	0.11111	M	9/26/2019	04:03	A092619D 030
	Thallium	0.00111	U		0.0006	0.00030	0.00111	M	9/26/2019	04:03	A092619D 030
	Vanadium	0.00222	U		0.0011	0.00074	0.00222	M	9/26/2019	04:03	A092619D 030
	Zinc	0.00308	J		0.0028	0.00185	0.00556	M	9/27/2019	02:54	A092719 2355 (

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Aqueous LCS Source: Inorganic Ventures **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Q	QC Criteria	M
3017606									
	Aluminum	mg/L	2.2220	2.0996		94		84 - 117	M
	Antimony	mg/L	0.2220	0.2183		98		85 - 117	M
	Arsenic	mg/L	0.2220	0.2333		105		84 - 116	M
	Barium	mg/L	2.2220	2.2180		100		86 - 114	M
	Beryllium	mg/L	0.2220	0.2205		99		83 - 121	M
	Cadmium	mg/L	0.2220	0.2194		99		87 - 115	M
	Calcium	mg/L	2.2220	2.2558		102		87 - 118	M
	Chromium	mg/L	0.2220	0.2230		100		85 - 116	M
	Cobalt	mg/L	0.2220	0.2189		99		86 - 115	M
	Copper	mg/L	0.2220	0.2192		99		85 - 118	M
	Iron	mg/L	2.2220	2.2637		102		87 - 118	M
	Lead	mg/L	0.2220	0.2284		103		88 - 115	M
	Magnesium	mg/L	2.2220	2.2413		101		83 - 118	M
	Manganese	mg/L	0.2220	0.2275		102		87 - 115	M
	Nickel	mg/L	0.2220	0.2283		103		85 - 117	M
	Potassium	mg/L	2.2220	2.2851		103		87 - 115	M
	Selenium	mg/L	0.2220	0.2229		100		80 - 120	M
	Silver	mg/L	0.1110	0.1083		98		85 - 116	M
	Sodium	mg/L	2.2220	2.2898		103		85 - 117	M
	Thallium	mg/L	0.2220	0.2294		103		82 - 116	M
	Vanadium	mg/L	0.2220	0.2237		101		86 - 115	M
	Zinc	mg/L	0.2220	0.2153		97		83 - 119	M

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INTERFERENCE CHECK SAMPLE

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

ICS Source: Inorganic Ventures **Instrument ID:** AGILENT 7700 ICPMS

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	Analysis Date	Analysis Time	Run Number
ICSAB									
	Aluminum	88.1	100.0000	88		80 - 120%	9/26/2019	03:43	A092619D 03
	Antimony	0.0005				-0.00200 - -0.00200	9/26/2019	03:43	A092619D 03
	Barium	0.0007				-0.00500 - -0.00500	9/26/2019	03:43	A092619D 03
	Beryllium	0.00000				-0.001000 - -0.001000	9/26/2019	03:43	A092619D 03
	Cadmium	0.0102	0.01000	102		80 - 120%	9/26/2019	03:43	A092619D 03
	Calcium	91.0	100.0000	91		80 - 120%	9/26/2019	03:43	A092619D 03
	Chromium	0.0190	0.02000	95		80 - 120%	9/26/2019	03:43	A092619D 03
	Cobalt	0.0349	0.04000	87		80 - 120%	9/26/2019	03:43	A092619D 03
	Lead	0.0001				-0.00200 - -0.00200	9/26/2019	03:43	A092619D 03
	Magnesium	98.5871	100.00000	99		80 - 120%	9/26/2019	03:43	A092619D 03
	Manganese	0.0201	0.02000	100		80 - 120%	9/26/2019	03:43	A092619D 03
	Nickel	0.0367	0.04000	92		80 - 120%	9/26/2019	03:43	A092619D 03
	Potassium	99.1147	100.00000	99		80 - 120%	9/26/2019	03:43	A092619D 03
	Silver	0.0189	0.02000	94		80 - 120%	9/26/2019	03:43	A092619D 03
	Sodium	95.8801	100.00000	96		80 - 120%	9/26/2019	03:43	A092619D 03
	Thallium	0.00005				-0.001000 - -0.001000	9/26/2019	03:43	A092619D 03
	Vanadium	0.0382	0.04000	96		80 - 120%	9/26/2019	03:43	A092619D 03

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INTERFERENCE CHECK SAMPLE

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

ICS Source: Inorganic Ventures **Instrument ID:** AGILENT 7700 ICPMS

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	Analysis Date	Analysis Time	Run Number
ICSA									
	Aluminum	83.7	100.0000	84		80 - 120%	9/26/2019	03:53	A092619D 03
	Antimony	0.0002				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Barium	0.0005				-0.02000 - -0.02000	9/26/2019	03:53	A092619D 03
	Beryllium	0.00000				-0.002000 - -0.002000	9/26/2019	03:53	A092619D 03
	Cadmium	0.0010				-0.00200 - -0.00200	9/26/2019	03:53	A092619D 03
	Calcium	85.7	100.0000	86		80 - 120%	9/26/2019	03:53	A092619D 03
	Chromium	0.0000				-0.00800 - -0.00800	9/26/2019	03:53	A092619D 03
	Cobalt	0.0006				-0.01200 - -0.01200	9/26/2019	03:53	A092619D 03
	Lead	0.0001				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Magnesium	95.9195	100.00000	96		80 - 120%	9/26/2019	03:53	A092619D 03
	Manganese	0.0012				-0.02000 - -0.02000	9/26/2019	03:53	A092619D 03
	Nickel	0.0012				-0.01000 - -0.01000	9/26/2019	03:53	A092619D 03
	Potassium	97.9671	100.00000	98		80 - 120%	9/26/2019	03:53	A092619D 03
	Silver	0.0000				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
	Sodium	93.6543	100.00000	94		80 - 120%	9/26/2019	03:53	A092619D 03
	Thallium	0.00001				-0.002000 - -0.002000	9/26/2019	03:53	A092619D 03
	Vanadium	-0.0001				-0.00400 - -0.00400	9/26/2019	03:53	A092619D 03
ICSA									
	Arsenic	0.0002				-0.00600 - -0.00600	9/27/2019	00:28	A092719 2355
	Barium	0.0005				-0.02000 - -0.02000	9/27/2019	00:28	A092719 2355
	Copper	0.0012				-0.01000 - -0.01000	9/27/2019	00:28	A092719 2355
	Iron	85.4397	100.00000	85		80 - 120%	9/27/2019	00:28	A092719 2355
	Selenium	0.0003				-0.01000 - -0.01000	9/27/2019	00:28	A092719 2355
	Zinc	0.0017				-0.02000 - -0.02000	9/27/2019	00:28	A092719 2355
ICSAB									
	Arsenic	0.0196	0.02000	98		80 - 120%	9/27/2019	00:31	A092719 2355
	Barium	0.0007				-0.00500 - -0.00500	9/27/2019	00:31	A092719 2355
	Copper	0.0175	0.02000	88		80 - 120%	9/27/2019	00:31	A092719 2355
	Iron	96.1664	100.00000	96		80 - 120%	9/27/2019	00:31	A092719 2355
	Selenium	0.0226	0.02000	113		80 - 120%	9/27/2019	00:31	A092719 2355
	Zinc	0.0188	0.02000	94		80 - 120%	9/27/2019	00:31	A092719 2355

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15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-031

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/26/2019

Sample No.	Client ID	Time	Internal Standards %RI For: Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
BLK	ZZZZZZ	0306												
BLK	BLK	0309	100		100		100		100		100		100	
STANDARD 5	STANDARD 5	0312	109		108		107		113		112		110	
ICV	ZZZZZZ	0316												
ICB1	ZZZZZZ	0319												
ICB2	ICB	0322	98		100		99		105		105		99	
LLICV	LLICV	0325	100		102		100		103		105		101	
ICV	ZZZZZZ	0333												
ICV	ICV	0337	106		106		100		104		109		106	
ICS-A1	ZZZZZZ	0340												
ICS-AB1	ICSAB	0343	96		101		108		112		116		105	
CHECK	ZZZZZZ	0347												
CHECK	ZZZZZZ	0350												
ICS-A2	ICSA	0353	97		103		117		119		123	*	107	
CHECK	ZZZZZZ	0356												
3017605	MB for HBN 54419	0403	103		104		104		106		110		104	
3017606	LCS for HBN 5441	0406	110		113		109		114		115		113	
3058771002	ZZZZZZ	0409												
3058771003	ZZZZZZ	0413												
3058771003S	ZZZZZZ	0416												
3058771003S	ZZZZZZ	0419												
3058771004	ZZZZZZ	0422												
3058771005	ZZZZZZ	0426												
3058771006	ZZZZZZ	0429												
3058771007	ZZZZZZ	0432												
CCV1	CCV	0436	113		114		112		112		119		115	
CCB1	CCB	0439	106		108		106		105		110		108	
3017605	ZZZZZZ	0443												
3059231002	ZZZZZZ	0446												
3059231003	ZZZZZZ	0450												
3059231004	ZZZZZZ	0453												
3059231005	ZZZZZZ	0456												
3059231006	ZZZZZZ	0500												
3059231007	ZZZZZZ	0503												
3059275002	03MW03SI-2019092	0506	104		106		106		107		112		106	
3059275003	03MW03I-20190920	0510	104		105		106		107		110		106	
3059275004	03MW04I-20190920	0513	107		111		114		102		111		112	
CCV2	ZZZZZZ	0516												
CCB2	CCB	0519	105		108		110		101		99		108	
CCV3	ZZZZZZ	0524												
CCV4	CCV	0527	106		105		103		108		123	*	107	
3059275005	03DUP02-20190920	0530	103		105		105		106		107		106	
3053278004	ZZZZZZ	0534												
3053278005	ZZZZZZ	0537												

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-031

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/26/2019

Sample No.	Client ID	Time	Internal Standards %RI For: Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
3053278006	ZZZZZZ	0540												
3059836021	ZZZZZZ	0544												
LDR	ZZZZZZ	0550												
CHECK	ZZZZZZ	0555												
CCV5	CCV	0558	107		108		104		107		109		107	
CCB3	CCB	0601	99		103		103		104		93		101	

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ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-031

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/27/2019

Sample No.	Client ID	Time	Internal Standards %RI For:											
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
BLK	ZZZZZZ	2355												
BLK	BLK	2358	100		100		100		100		100		100	
STANDARD 5	STANDARD 5	0002	104		101		99		108		101		104	
ICV	ICV	0005	108		108		104		107		102		110	
ICB1	ZZZZZZ	0008												
ICB2	ICB	0011	98		98		101		100		98		100	
LLICV	LLICV	0015	103		102		103		104		99		103	
ICS-A1	ICSA	0028	92		97		113		115		111		100	
ICS-AB1	ICSAB	0031	96		100		110		112		107		106	
CHECK	ZZZZZZ	0034												
CHECK	ZZZZZZ	0046												
LDR	ZZZZZZ	0049												
CHECK	ZZZZZZ	0058												
3017605	MB for HBN 54419	0104	103		103		103		105		102		105	
3017606	LCS for HBN 5441	0107	109		110		106		110		104		112	
3058771002	ZZZZZZ	0111												
3058771003	ZZZZZZ	0114												
3058771003S	ZZZZZZ	0117												
3058771003S	ZZZZZZ	0120												
3058771004	ZZZZZZ	0124												
3058771005	ZZZZZZ	0127												
3058771006	ZZZZZZ	0130												
3058771007	ZZZZZZ	0133												
CCV1	CCV	0137	115		116		111		112		106		119	
CCB1	CCB	0140	104		104		104		106		103		106	
3059231002	ZZZZZZ	0148												
3059231003	ZZZZZZ	0151												
3059231004	ZZZZZZ	0155												
3059231005	ZZZZZZ	0158												
3059231006	ZZZZZZ	0201												
3059231007	ZZZZZZ	0205												
3059275002	03MW03SI-2019092	0208	98		98		99		103		98		99	
3059275003	03MW03I-20190920	0211	106		110		114		103		100		111	
3059275004	03MW04I-20190920	0214	101		102		104		105		103		104	
3059275005	03DUP02-20190920	0218	102		103		104		103		99		104	
CCV2	CCV	0221	108		107		102		106		103		109	
CCB2	CCB	0224	101		101		98		102		98		103	
3017605	ZZZZZZ	0228												
3053278004	ZZZZZZ	0231												
3053278005	ZZZZZZ	0236												
3053278006	ZZZZZZ	0239												
3059836032	ZZZZZZ	0245												
3059836032	ZZZZZZ	0251												
3017605	MB for HBN 54419	0254	96		97		98		101		97		97	

6020 3015 DOD

15-IN

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Lab Name: ALS ENVIRONMENTAL Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 NRAS No.: SDG NO.: EPR-031

ICP-MS Instrument ID: AGILENT 7700 ICPMS Start Date: 09/26/2019 End Date: 09/27/2019

Sample No.	Client ID	Time	Internal Standards %RI For:											
			Element Bi_209	Q	Element In_115	Q	Element Sc_45	Q	Element Sc_45-2	Q	Element Sc_45-3	Q	Element Tb_159	Q
CCV3	CCV	0258	105		104		101		105		100		107	
CCB3	CCB	0301	100		100		99		102		98		104	

Microwave 3015 Prep (Water) (Version 2- 11/12/2015)

Note: All TCLP matrix spikes are spiked prior to preservation as noted in the TCLP logbook.

Batch: 80070	**Queue:** MDIG	**HBN:** 544196	**RULE:** D3015/6020	**ALSI SOP:** 09-3015	
File Name: 80070_190925-200808			**METHOD:** 3015	**Microwave ID:** MWV-1	

Batch Type:	**Comment Codes:**	**Reagents:**		**Pipettes:**		**Start**	**Finish**
T: TCLP	1. Sample failed initial digestion due to a weight loss >5g	HNO3:	190124005	03-345	**Date:**	09/25/2019	09/25/2019
S: SPLP	2. Sample reacts with reagent	HCL:	180920001	03-306	**Time:**	20:15:00	20:45:00
M: 6020	3. Less sample used due to high metal content	Balance ID:	BAL-11	03-309	**Tech:**	SXC	SXC
W: 6010	4. Less sample used to result in successful microwave digestion				**Reviewed/Approved By:**		
A: ASTM	5. Sample does not digest by microwave, digest by method 3050				**Date:**		

Sample ID	Cont ID	Samp Type	Vessel Initial WT, grams	Vessel Final WT, grams	Difference grams	Spike Amt uL of Each	Spike Lot#	Sample Size, mL	Final Vol mL	Batch Type	Parent Sample ID	Comment Code
3017605		MB	210.316	210.289	0.027			45	50	M		
3017606		LCS	212.242	212.218	0.024	40/50/50/50/50	010/190125008/190	45	50	M		
3058771002	C	S	209.851	209.755	0.096			45	50	M		
3058771003	G	S	211.393	211.364	0.029			45	50	M		
3017608		MS	212.050	211.994	0.056	40/50/50/50/50	010/190125008/190	45	50	M	3058771003	
3017609		MSD	212.257	212.197	0.060	40/50/50/50/50	010/190125008/190	45	50	M	3058771003	
3058771004	C	S	210.415	210.322	0.093			45	50	M		
3058771005	C	S	212.189	212.117	0.072			45	50	M		
3058771006	C	S	210.425	210.389	0.036			45	50	M		
3058771007	C	S	211.901	211.821	0.080			45	50	M		
3059231002	C	S	212.525	212.483	0.042			45	50	M		
3059231003	C	S	210.563	210.500	0.063			45	50	M		
3059231004	C	S	213.186	213.160	0.026			45	50	M		
3059231005	C	S	213.609	213.547	0.062			45	50	M		
3059231006	C	S	210.148	210.097	0.051			45	50	M		
3059231007	C	S	211.586	211.523	0.063			45	50	M		
3059275002	C	S	211.634	211.575	0.059			45	50	M		
3059275003	C	S	212.550	212.487	0.063			45	50	M		
3059275004	C	S	212.239	212.197	0.042			45	50	M		
3059275005	C	S	212.987	212.916	0.071			45	50	M		
3053278004	A	S	210.156	210.113	0.043			45	50	M		
3053278005	A	S	211.520	211.487	0.033			45	50	M		
3053278006	A	S	210.897	210.833	0.064			45	50	M		
3059836032	A	S	211.551	211.519	0.032			45	50	M		

End

Total Mercury by Method 7470 Summary Forms

7470 DOD
- COVER PAGE -
INORGANIC ANALYSIS DATA PACKAGE

Client: Earth Toxics Inc.

SDG No.: EPR-031 **Method Type:** 7470 DOD **SOW No.:**

Contract: EPR031|Willow Grove **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Lab Sample ID	Client Sample ID	QC Description
3059275002	03MW03SI-20190920	
3059275003	03MW03I-20190920	
3059275004	03MW04I-20190920	
3059275005	03DUP02-20190920	

Were ICP interelement corrections applied?	Yes/No	Yes	
Were ICP background corrections applied?	Yes/No	Yes	
If yes - were raw data generated before applications of background corrections?	Yes/No	No	

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: **Matthew Olley**

Date: Title: **Metals Supervisor**

Report Generated By Teledyne Leeman QuickTrace

Analyst: ALMDT.NoUser

Worksheet file: C:\Users\Public\Documents\Teledyne CETAC\QuickTrace\Worksheets\092619W.wszf

Creation Date: 9/26/2019 1:57:06 PM

Comment:

REVIEWED BY AHI 9/26/19 17:30

APPROVED
By Meghan Pettis at 6:44 am, Sep 27, 2019

Results

Sample Name	Type	Date/Time	Conc (ug/L)	µAbs	Residual	Flags	DF	% Recovery
Calibration Blank	STD	09/26/19 02:36:58 pm	0.000	213	-28.12		1.00	N/A
Replicates	172.5	228.2	195.4	254.4				
Standard #1 (0.2 ug/L)	STD	09/26/19 02:38:10 pm	0.200	2113	-20.46		1.00	N/A
Replicates	2009.2	2137.9	2124.4	2180.5				
Standard #2 (1 ug/L)	STD	09/26/19 02:39:23 pm	1.000	10153	58.12		1.00	N/A
Replicates	9754.2	10143.5	10334.3	10380.8				
Standard #3 (2 ug/L)	STD	09/26/19 02:40:35 pm	2.000	19084	34.06		1.00	N/A
Replicates	18415.1	19118.9	19374.4	19429.2				
Standard #4 (4 ug/L)	STD	09/26/19 02:41:49 pm	4.000	36597	-52.30		1.00	N/A
Replicates	35025.0	36656.0	37250.8	37455.5				
Standard #5 (10 ug/L)	STD	09/26/19 02:43:02 pm	10.000	92063	8.71		1.00	N/A
Replicates	88467.6	92155.6	93547.1	94083.4				

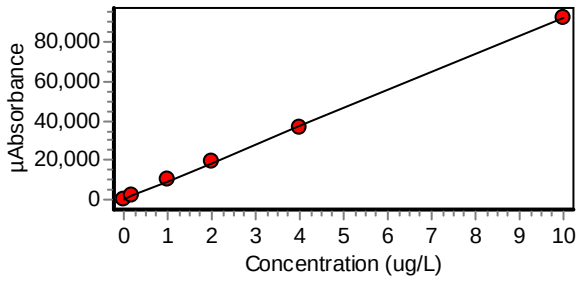
Calibration

Equation: Abs = 9151.378x + 469.948

R2: 0.99988

SEE: 423.3007

Flags:



ICV	ICV	09/26/19 02:45:37 pm	4.120	38193			1.00	103.05
Replicates	36676.0	38284.6	38858.8	38951.8				
ICB	ICB	09/26/19 02:46:51 pm	-0.036	143			1.00	N/A
Replicates	139.8	142.6	159.8	131.3				
LL CCV LOQ 0.5 ug/L RECOVERED AT 86.6% AHI 9/26/19	UNK	09/26/19 02:48:02 pm	0.433	4431			1.00	N/A
Replicates	4252.8	4486.9	4451.5	4533.7				
3017954	UNK	09/26/19 02:49:14 pm	-0.040	108			1.00	N/A
Replicates	104.2	125.9	111.5	90.5				
3017955	UNK	09/26/19 02:50:25 pm	1.870	17593			1.00	N/A
Replicates	16717.1	17439.9	17887.7	18327.4				
3017956	UNK	09/26/19 02:51:37 pm	1.770	16702			1.00	N/A
Replicates	15855.0	16570.5	17007.0	17376.9				
3059231002	UNK	09/26/19 02:52:49 pm	-0.054	-22			1.00	N/A
Replicates	-71.0	12.0	-14.5	-13.0				

7470 DOD
14
ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-031

Instrument ID Number: Cetac Hg Method: CV Run Number: 092619W

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
Calibration Blank	1.00	1436																X								
Standard #1 (0.2 ug	1.00	1438																X								
Standard #2 (1 ug/L	1.00	1439																X								
Standard #3 (2 ug/L	1.00	1440																X								
Standard #4 (4 ug/L	1.00	1441																X								
Standard #5 (10 ug/	1.00	1443																X								
ICV	1.00	1445																X								
ICB	1.00	1446																X								
ZZZZZZ	1.00	1448																								
MB for HBN 544296 [	1.00	1449																X								
LCS for HBN 544296 [	1.00	1450																X								
LCS for HBN 544296 [	1.00	1451																X								
ZZZZZZ	1.00	1452																								
ZZZZZZ	1.00	1454																								
ZZZZZZ	1.00	1455																								
ZZZZZZ	1.00	1456																								
ZZZZZZ	1.00	1457																								
ZZZZZZ	1.00	1458																								
CCV	1.00	1500																X								
CCB	1.00	1501																X								
03MW03SI-20190920	1.00	1502																X								
03MW03I-20190920	1.00	1503																X								
03MW04I-20190920	1.00	1504																X								
03DUP02-20190920	1.00	1506																X								
ZZZZZZ	1.00	1507																								
ZZZZZZ	1.00	1508																								
ZZZZZZ	1.00	1509																								
ZZZZZZ	1.00	1510																								
ZZZZZZ	1.00	1512																								
ZZZZZZ	1.00	1513																								
CCV	1.00	1514																X								
CCB	1.00	1515																X								
ZZZZZZ	1.00	1517																								
ZZZZZZ	1.00	1518																								
ZZZZZZ	1.00	1519																								
ZZZZZZ	1.00	1520																								

7470 DOD
14
ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-031

Instrument ID Number: Cetac Hg Method: CV Run Number: 092619W

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	1521																								
ZZZZZZ	1.00	1523																								
ZZZZZZ	1.00	1524																								
ZZZZZZ	1.00	1525																								
ZZZZZZ	1.00	1526																								
ZZZZZZ	1.00	1527																								
ZZZZZZ	1.00	1529																								
ZZZZZZ	1.00	1530																								
ZZZZZZ	1.00	1531																								
ZZZZZZ	1.00	1532																								
ZZZZZZ	1.00	1533																								
ZZZZZZ	1.00	1535																								
ZZZZZZ	1.00	1536																								
ZZZZZZ	1.00	1537																								
ZZZZZZ	1.00	1538																								
ZZZZZZ	1.00	1539																								
ZZZZZZ	1.00	1541																								
ZZZZZZ	1.00	1542																								
ZZZZZZ	1.00	1543																								
ZZZZZZ	1.00	1544																								
ZZZZZZ	1.00	1546																								
ZZZZZZ	1.00	1547																								
ZZZZZZ	1.00	1548																								
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ZZZZZZ	1.00	1552																								
ZZZZZZ	1.00	1553																								
ZZZZZZ	1.00	1554																								
ZZZZZZ	1.00	1555																								
ZZZZZZ	1.00	1556																								
ZZZZZZ	1.00	1558																								
ZZZZZZ	1.00	1559																								
ZZZZZZ	1.00	1600																								
ZZZZZZ	1.00	1601																								
ZZZZZZ	1.00	1603																								
ZZZZZZ	1.00	1604																								

7470 DOD
14
ANALYSIS RUN LOG

Client: Earth Toxics Inc. Contract: EPR031|Willow Grove Sites 3 &

Lab Code: ALS Case No.: WE04 SAS No.: SDG No.: EPR-031

Instrument ID Number: Cetac Hg Method: CV Run Number: 092619W

Start Date: 9/26/2019 End Date: 9/26/2019

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.00	1605																								
ZZZZZZ	1.00	1606																								
ZZZZZZ	1.00	1607																								
ZZZZZZ	1.00	1609																								
ZZZZZZ	1.00	1610																								
ZZZZZZ	1.00	1611																								
ZZZZZZ	1.00	1612																								
ZZZZZZ	1.00	1613																								
ZZZZZZ	1.00	1615																								
ZZZZZZ	1.00	1639																								
ZZZZZZ	1.00	1640																								
ZZZZZZ	1.00	1641																								
ZZZZZZ	1.00	1642																								
ZZZZZZ	1.00	1643																								
ZZZZZZ	1.00	1645																								
ZZZZZZ	1.00	1646																								
ZZZZZZ	1.00	1647																								
ZZZZZZ	1.00	1648																								
ZZZZZZ	1.00	1649																								
ZZZZZZ	1.00	1651																								
ZZZZZZ	1.00	1652																								
ZZZZZZ	1.00	1653																								
ZZZZZZ	1.00	1654																								
ZZZZZZ	1.00	1656																								
ZZZZZZ	1.00	1657																								
ZZZZZZ	1.00	1658																								
ZZZZZZ	1.00	1659																								
ZZZZZZ	1.00	1700																								
ZZZZZZ	1.00	1702																								
ZZZZZZ	1.00	1703																								
ZZZZZZ	1.00	1704																								
ZZZZZZ	1.00	1705																								
ZZZZZZ	1.00	1706																								
ZZZZZZ	1.00	1709																								
ZZZZZZ	1.00	1710																								

7470 DOD

- 2a -

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Initial Calibration Source: Inorganic Ventures

Continuing Calibration Source: CAS MIXED

Sample ID	Analyte	Result mg/L	True Value mg/L	% Recovery	Q	QC Criteria	M	Analysis Date	Analysis Time	Run Number
ICV	Mercury	0.0041	0.004	102		90 - 110	CV	9/26/2019	14:45	092619W
CCV	Mercury	0.0042	0.004	105		90 - 110	CV	9/26/2019	15:00	092619W
CCV	Mercury	0.0041	0.004	102		90 - 110	CV	9/26/2019	15:14	092619W

7470 DOD

- 3a -

INITIAL AND CONTINUING CALIBRATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result mg/L	Conc Qual	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
ICB	Mercury	0.00050	U	0.00035	0.00016	0.00050	CV	9/26/2019	14:46	092619W
CCB	Mercury	0.00050	U	0.00035	0.00016	0.00050	CV	9/26/2019	15:01	092619W
CCB	Mercury	0.00050	U	0.00035	0.00016	0.00050	CV	9/26/2019	15:15	092619W

7470 DOD
- 13 -
SAMPLE PREPARATION SUMMARY

Client: Earth Toxics Inc.

SDG No.: EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS

Method: CV

Case No.: WE04 **SAS No.:**

Sample ID	Client ID	Sample Type	Matrix	Prep Date	Initial Sample Size(g)	Final Sample Volume (mL)	Percent Solids
Batch Number:	544296						
3017954	MB for HBN 544296 [MDIG/8008	MB	QC-WAT	9/26/19	5.0	5.0	
3017955	LCS for HBN 544296 [MDIG/8008	LCS	QC-WAT	9/26/19	5.0	5.0	
3017956	LCS for HBN 544296 [MDIG/8008	LCS	QC-WAT	9/26/19	5.0	5.0	
3059275002	03MW03SI-20190920	SAM	WATER	9/26/19	5.0	5.0	
3059275003	03MW03I-20190920	SAM	WATER	9/26/19	5.0	5.0	
3059275004	03MW04I-20190920	SAM	WATER	9/26/19	5.0	5.0	
3059275005	03DUP02-20190920	SAM	WATER	9/26/19	5.0	5.0	

7470 DOD
- 3b -
PREPARATION BLANK SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Sample ID	Analyte	Result (mg/L)	Conc Qual	Q	QC Criteria	MDL	PQL	M	Analysis Date	Analysis Time	Run
3017954			**QC-WATER**								
	Mercury	0.000500	U		0.0003	0.000160	0.000500	CV	9/26/2019	14:49	092619W

7470 DOD

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LABORATORY CONTROL SAMPLE SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Aqueous LCS Source: CAS MIXED **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Q	QC Criteria	M
3017955									
	Mercury	mg/L	0.0020	0.0019		95		82 - 119	CV

7470 DOD
- 7 -
LABORATORY CONTROL SAMPLE SUMMARY

Client: Earth Toxics Inc. **SDG No.:** EPR-031

Contract: EPR031|Willow Grove Sites 3 & **Lab Code:** ALS **Case No.:** WE04 **SAS No.:**

Aqueous LCS Source: CAS MIXED **Solid LCS Source:**

Sample ID	Analyte	Units	True Value	Result	C	% Recovery	Q	QC Criteria	M
3017956									
	Mercury	mg/L	0.0020	0.0018		90		82 - 119	CV

Mercury 7470 Prep (Water) rev 11/12/2015

Batch: 80082	Queue: MDIG	HBN: 544296	RULE: D7470PREP	ALS SOP:
File Name: 80082_190926-131335				WaterBath ID:

Comments:	Thermometer:			Start
1)	ID:	TH-048	Date:	09/26/2019
2)	Starting ºC:	95ºC	Time:	10:15:00
3)	Ending ºC:	95ºC	Tech:	AHI
4)			Reviewed/Approved By:	
5)			Date:	

Reagents and Working Standards	Reagent ID	Pipette ID
Intermediate STD: 0.1 mL 1000 ppm to 100mL	MR18785	03-034
Intermediate QC: 0.1 mL 1000 ppm to 100mL	MR18786	03-034
5% KMnO4:	MR18186	
5% K2S2O8:	MR18765	
H2SO4:	190221011	
HNO3:	190321004	
Working STD: 2.5mL Intermediate STD+300uL HNO3 to 100mL	MR18889	GEN-006
Working QC: 2.5mL Intermediate QC+300uL HNO3 to 100mL	MR18890	GEN-006

Calibration and Check Standards	Num
S0(ICB, CCB):# of S0's made:	3
S0.2: 0.200 mL Working Std into 25 mL:	MR18891
S1.0: 1.0 mL Working Std into 25 mL:	MR18892
S2.0: 2.0 mL Working Std into 25 mL:	MR18893
S4.0: 4.0 mL Working Std into 25 mL:	MR18894
S10: 10.0 mL Working Std into 25 mL:	MR18895
CCV: 4.0 mL Working QC into 25 mL:	MR18896
ICV: 4.0 mL Working Std into 25 mL:	MR18897
# of CCV's made:	3

Sample ID	Cont ID	Samp Type	Parent Sample ID	Sample Size, mL	Additional KMnO4, mL	Final Vol mL	Spike Amt mL	Spike Std #	Pipette ID#	Com
3017954		MB		5		5				
3017955		LCS		5		5	0.4	MR18889	GEN-004	
3017956		LCS		5		5	0.4	MR18889	GEN-004	
3059231002	C	S		5		5				
3059231003	C	S		5		5				
3059231004	C	S		5		5				
3059231005	C	S		5		5				
3059231006	C	S		5		5				
3059231007	C	S		5		5				
3059275002	C	S		5		5				
3059275003	C	S		5		5				
3059275004	C	S		5		5				
3059275005	C	S		5		5				
3059836001	A	S		5		5				
3059836002	A	S		5		5				

3059836003	A	S		5		5				
3059836004	A	S		5		5				
3059836005	A	S		5		5				
3059836006	A	S		5		5				
3059836007	A	S		5		5				
3059836008	A	S		5		5				
3059836009	A	S		5		5				
3059836010	A	S		5		5				

End

ANALYTE	ORIGINAL 03MW03SI-20190920	DUPLICATE 03DUP02-20190920	RL	RPD	RPD > 30%	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
BARIUM	0.3	0.3	0.005	0.0	FALSE	TRUE	TRUE	FALSE
CALCIUM	22.5	22.2	0.11	1.3	FALSE	TRUE	TRUE	TRUE
MAGNESIUM	9.2	9.1	0.11	1.1	FALSE	TRUE	TRUE	FALSE
POTASSIUM	0.59	0.58	0.11	1.7	FALSE	TRUE	TRUE	FALSE
SODIUM	9.1	8.8	0.11	3.4	FALSE	TRUE	TRUE	TRUE
VANADIUM	0.0018	0.0018	0.002	0.0	FALSE	FALSE	FALSE	FALSE
TETRACHLOROETHENE	7.2	7.3	1	1.4	FALSE	TRUE	TRUE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!	FALSE	FALSE	FALSE
				#DIV/0!	#DIV/0!			

VOC CALCULATION	SAMPLE			
	03MW03SI-20190920			
TARGET ANALYTE	tetrachloroethene			
ANALYTE RESPONSE	80118			
INTERNAL STANDARD	chlorobenzene-d5			
I.S. RESPONSE	772043			
I.S. CONCENTRATION	30	µg/l		
ANALYTE CAL. RF	0.43141			
DILUTION FACTOR (DF)	1			
INITIAL SAMPLE VOLUME - V1	5	ml		
FINAL SAMPLE VOLUME - V2	5	ml		
ON COLUMN AMOUNT	7.216384362	µg/l		
(ANALYTE RESPONSE) x (I.S. CONCENTRATION) X DF x V2	=	**7.22**	**µg/l**	
(I.S. RESPONSE) x (CAL. R.F.) x V1	=	**0.00721638**	**mg/l**	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

03MW03SI-20190920

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: EPR-031

Matrix (soil/water): WATER Lab Sample ID: 3059275002

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 719092719.D

Level (low/med): Date Received: 9/21/19

% Moisture: not dec. 100.0 Date Analyzed: 9/27/19

GC Column: RTXVRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS No.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
98-82-8	Isopropylbenzene	0.75	U
79-20-9	Methyl acetate	0.75	U
108-87-2	Methyl cyclohexane	0.75	U
1634-04-4	Methyl t-Butyl Ether	0.75	U
108-10-1	4-Methyl-2-Pentanone(MIBK)	3.8	U
75-09-2	Methylene Chloride	0.75	U
100-42-5	Styrene	0.75	U
79-34-5	1,1,2,2-Tetrachloroethane	0.75	U
127-18-4	Tetrachloroethene	7.2	
108-88-3	Toluene	0.75	U
1330-20-7	Total Xylenes	2.3	U
87-61-6	1,2,3-Trichlorobenzene	0.75	U
120-82-1	1,2,4-Trichlorobenzene	0.75	U
71-55-6	1,1,1-Trichloroethane	0.75	U
79-00-5	1,1,2-Trichloroethane	0.75	U
79-01-6	Trichloroethene	0.75	U
75-69-4	Trichlorofluoromethane	0.75	U
75-01-4	Vinyl Chloride	0.75	U

ALS Environmental Services

VOLATILE REPORT SW-846 Method 8260

Data file : \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190927.b\719092719.
Lab Smp Id: 3059275002 Client Smp ID: 03MW03SI-20190920
Inj Date : 27-SEP-2019 20:38
Operator : TMP Inst ID: ms07.i
Smp Info : 3059275002;;1;;;;;
Misc Info : ZZ VOMS 52473 D8260W
Comment :
Method : \\ALMDTWS014\TargetData\Chem2\ms07.i\7-2019\7190927.b\7-8260b09.
Meth Date : 27-Sep-2019 13:23 tmp Quant Type: ISTD
Cal Date : 27-SEP-2019 01:40 Cal File: 719092608.D
Als bottle: 19
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: DODall.sub
Target Version: 4.14
Processing Host: ALMDTW7047

Concentration Formula: Amt * DF * Uf * 5/Vo * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged
DF	1.000	sample dilution factor
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/L)	REVIEW CODE
1 Dichlorodifluoromethane	85	Compound Not Detected.						
2 Chloromethane	50	Compound Not Detected.						
3 Vinyl Chloride	62	Compound Not Detected.						
4 Bromomethane	94	Compound Not Detected.						
5 Chloroethane	64	Compound Not Detected.						
6 Pentane	41	Compound Not Detected.						
7 Trichlorofluoromethane	101	Compound Not Detected.						
8 Dichlorofluoromethane	67	Compound Not Detected.						
9 Ethyl Ether	74	Compound Not Detected.						
10 1,1-Dichloroethene	61	Compound Not Detected.						
12 Carbon Disulfide	76	Compound Not Detected.						
11 Freon 113	101	Compound Not Detected.						
13 Iodomethane	127	Compound Not Detected.						
14 Acrolein	56	Compound Not Detected.						
16 3-Chloro-1-propene	41	Compound Not Detected.						
15 Isopropyl Alcohol	45	2.561	2.561	(0.631)	11294	109.273	109.273	
17 Methylene Chloride	84	Compound Not Detected.						
18 Acetone	58	Compound Not Detected.						
19 Methyl acetate	74	Compound Not Detected.						
20 trans-1,2-Dichloroethene	61	Compound Not Detected.						
21 Hexane	57	Compound Not Detected.						

								CONCENTRATIONS		
			QUANT SIG					ON-COLUMN	FINAL	
	Compounds		MASS	RT	EXP RT	REL RT	RESPONSE	(ug/l)	(ug/L)	REVIEW CODE
	74 Tetrachloroethene		164	5.294	5.294	(0.874)	80118	7.21635	7.21635	
	76 Ethyl methacrylate		69	Compound Not Detected.						
	77 1,1,2-Trichloroethane		83	Compound Not Detected.						
	78 Chlorodibromomethane		129	Compound Not Detected.						
	79 1,3-Dichloropropane		76	Compound Not Detected.						
	80 1,2-Dibromoethane		107	Compound Not Detected.						
	81 2-Hexanone		43	Compound Not Detected.						
	82 1-Chlorohexane		91	Compound Not Detected.						
*	83 Chlorobenzene-d5		82	6.056	6.056	(1.000)	772043	30.0000		
	85 Ethylbenzene		106	Compound Not Detected.						
	84 Chlorobenzene		112	Compound Not Detected.						
	86 1,1,1,2-Tetrachloroethane		131	Compound Not Detected.						
	87 mp-Xylene		106	Compound Not Detected.						
M	120 1,3-Dichloropropene, Total		75	Compound Not Detected.						
	88 o-Xylene		106	Compound Not Detected.						
	89 Styrene		104	Compound Not Detected.						
	90 Bromoform		173	Compound Not Detected.						
	91 Isopropylbenzene		105	Compound Not Detected.						
$	92 4-Bromofluorobenzene		174	6.942	6.944	(0.887)	341564	33.4835	33.4835	
M	121 TOTAL XYLENES		106	Compound Not Detected.						
	94 n-Propylbenzene		120	Compound Not Detected.						
	93 Bromobenzene		156	Compound Not Detected.						
	95 1,1,2,2-Tetrachloroethane		83	Compound Not Detected.						
	97 1,3,5-Trimethylbenzene		105	Compound Not Detected.						
	96 o-Chlorotoluene		91	Compound Not Detected.						
	98 1,2,3-Trichloropropane		110	Compound Not Detected.						
	99 trans-1,4-Dichloro-2-butene		53	Compound Not Detected.						
	101 p-Chlorotoluene		91	Compound Not Detected.						
	102 tert-Butylbenzene		134	Compound Not Detected.						
	103 Pentachloroethane		117	Compound Not Detected.						
	104 1,2,4-Trimethylbenzene		105	Compound Not Detected.						
	105 sec-Butylbenzene		105	Compound Not Detected.						
	106 p-Isopropyltoluene		134	Compound Not Detected.						
	107 1,3-Dichlorobenzene		146	Compound Not Detected.						
*	108 1,4-Dichlorobenzene-d4		152	7.825	7.825	(1.000)	549882	30.0000		
	109 1,4-Dichlorobenzene		146	Compound Not Detected.						
	111 n-Butylbenzene		134	Compound Not Detected.						
	110 Benzyl Chloride		126	Compound Not Detected.						
	112 Hexachloroethane		117	Compound Not Detected.						
	113 1,2-Dichlorobenzene		146	Compound Not Detected.						
	114 1,2-Dibromo-3-chloropropane		75	Compound Not Detected.						
	115 Nitrobenzene		77	Compound Not Detected.						
	116 Hexachlorobutadiene		225	Compound Not Detected.						
	117 1,2,4-Trichlorobenzene		180	Compound Not Detected.						
	118 Naphthalene		128	Compound Not Detected.						
	119 1,2,3-Trichlorobenzene		180	Compound Not Detected.						

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ALS Global SDG No.: EPR-031

Instrument ID: ms07.i Calibration Date(s): 9/26/2019 9/27/2019

Heated Purge: (Y/N) N Calibration Time(s): 23:47 02:02

GC Column: RTXVRX ID: 0.25 (mm)

LAB FILE ID: RRF001 = 719092604.D RRF005 = 719092605.D RRF020 = 719092606.D RRF050 = 719092607.D

RRF100 = 719092608.D RRF200 = 719092609.D RRF00.5 = 719092603.D

COMPOUND	RRF200	RRF00.5		CT	b	m1	m2	% RSD or R^2
Iodomethane	1382757	690		Q	0.000000	0.065470	0.004760	0.99724
Isobutyl alcohol	168180	517		L	0.000000	850		0.99968
Isopropyl Alcohol		1185		Q	0.000000	0.001570	0.000040	0.99988
Isopropylbenzene	2.34275	2.19256		A		2.430030		8.73367
p-Isopropyltoluene	2844196	3485		L	0.000000	1.852440		0.99897
Methyl acetate	0.03283	0.02783		A		0.032370		14.36391
Methyl acrylate	0.19858	0.16360		A		0.183850		9.68054
Methacrylonitrile	0.09031	0.07986		A		0.086520		8.90228
Methyl cyclohexane	0.95878	0.63939		A		0.825020		14.41250
Methyl methacrylate	2678305	4234		L	0.000000	5.366240		0.99972
Methyl t-Butyl Ether	0.55841	0.44727		A		0.517460		8.69166
4-Methyl-2-Pentanone(MIBK)	8879024	12389		L	0.000000	3.448350		0.99966
Methylene Chloride	2899030	9497		L	0.000000	4.978390		0.99930
Naphthalene		2728		Q	0.000000	0.638090	0.099290	0.99418
Nitrobenzene	450615			Q	0.000000	0.001710	0.000100	0.99898
2-Nitropropane	3447114	4933		L	0.000000	8.927850		0.99943
Octane	1511894	3305		Q	0.000000	0.166900	0.012050	0.99968
Pentachloroethane	0.40458	0.35670		A		0.379580		6.69181
Pentane	0.19020	0.20506		A		0.207150		7.50739
n-Propanol	0.01128	0.01190		A		0.011440		3.63945
Propionitrile	0.02073	0.02107		A		0.021570		7.15448
n-Propylbenzene	0.68317	0.55010		A		0.654040		10.64739
Styrene	1.58580	1.48293		A		1.557650		7.34088
1,1,1,2-Tetrachloroethane	0.46619	0.36484		A		0.414500		9.53153
1,1,2,2-Tetrachloroethane *	0.64083	0.66296		A		0.659920		3.10559
Tetrachloroethene	0.44703	0.43897		A		0.431410		3.81941
Tetrahydrofuran	0.05266	0.05143		A		0.051910		7.32001
Toluene **	1.24124	1.16688		A		1.208190		5.01601
Total Xylenes	0.82971	0.74878		A		0.796160		7.88005
1,2,3-Trichlorobenzene	2094670	1021		Q	0.000000	0.310050	0.014020	0.99934
1,2,4-Trichlorobenzene	2649638	1171		Q	0.000000	0.397690	0.016900	0.99954
1,1,1-Trichloroethane	0.31645	0.26607		A		0.290180		8.17051
1,1,2-Trichloroethane	0.37765	0.34913		A		0.359400		4.47380
Trichloroethene	0.23226	0.28984		A		0.242780		8.77286
Trichlorofluoromethane	0.33458	0.35633		A		0.359340		5.21498
1,2,3-Trichloropropane	0.18180	0.18892		A		0.189450		3.42303

CT Column contains the Calibration Type. A - Average Response Factor, L - Linear Regression, and Q - Quadratic.

SPCC Compounds (*) with required minimum RRF.

CCC Compounds (**) with required maximum %RSD.

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APPENDIX E
PROJECT ACTION LIMITS

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SAP Worksheet #15 -- Reference Limits and Evaluation Table
(UFP-QAPP Manual Section 2.8.1)

Matrix: Groundwater
Analytical Group: VOCs

Analyte	CAS Number	PAL (µg/L)	PAL Reference[1]	PQLG (µg/L)	ALS Middleton		
		HHRA	HHRA		LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
1,1-DICHLOROETHANE	75-34-3	2.8	Tap Water RSL	0.77	1	0.75	0.33
1,1,1-TRICHLOROETHANE	71-55-6	200	MCL	70	1	0.75	0.33
1,1,2-TRICHLOROETHANE	**79-00-5**	**0.041**	**Tap Water RSL**	**0.014**	**1**	**0.75**	**0.33**
1,1,2,2-TETRACHLOROETHANE	**79-34-5**	**0.076**	**Tap Water RSL**	**0.025**	**1**	**0.75**	**0.33**
1,1,2-TRICHLORO-1,2,2- TRIFLUORO-ETHANE	76-13-1	1000	Tap Water RSL	300	1	0.75	0.33
1,1-DICHLOROETHENE	75-35-4	7	MCL	2	1	0.75	0.33
1,2-DICHLOROBENZENE	95-50-1	30	Tap Water RSL	10	1	0.75	0.33
1,2-DICHLOROETHANE	**107-06-2**	**0.17**	**Tap Water RSL**	**0.06**	**1**	**0.75**	**0.33**
1,2,3-TRICHLOROBENZENE	**87-61-6**	**0.7**	**Tap Water RSL**	**0.2**	**1**	**0.75**	**0.33**
1,2,4-TRICHLOROBENZENE	**120-82-1**	**0.4**	**Tap Water RSL**	**0.1**	**1**	**0.75**	**0.33**
1,2-DIBROMO-3- CHLOROPROPANE	**96-12-8**	**0.00033**	**Tap Water RSL**	**0.00011**	**5**	**2.5**	**1.6**
1,2-DIBROMOETHANE	**106-93-4**	**0.0075**	**Tap Water RSL**	**0.0025**	**1**	**0.75**	**0.33**
1,2-DICHLOROPROPANE	**78-87-5**	**0.14**	**Tap Water RSL**	**0.05**	**1**	**0.75**	**0.33**
1,3-DICHLOROBENZENE[2]	**541-73-1**	**0.48**	**Tap Water RSL**	**0.16**	**1**	**0.75**	**0.33**
1,4-DICHLOROBENZENE	**106-46-7**	**0.48**	**Tap Water RSL**	**0.16**	**1**	**0.75**	**0.33**
1,4-DIOXANE	**123-91-1**	**0.46**	**Tap Water RSL**	**0.15**	**125**	**63**	**42**
2-BUTANONE	78-93-3	560	Tap Water RSL	190	5	3.75	1.6
2-HEXANONE	591-78-6	3.8	Tap Water RSL	1.3	5	3.75	1.6

Analyte	CAS Number	PAL (µg/L)	PAL Reference[1]	PQLG (µg/L)	ALS Middleton		
		HHRA	HHRA		LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
4-METHYL-2-PENTANONE	108-10-1	630	Tap Water RSL	210	5	3.75	1.6
ACETONE	67-64-1	1400	Tap Water RSL	470	5	3.75	1.6
BENZENE	**71-43-2**	**0.46**	**Tap Water RSL**	**0.15**	**1**	**0.75**	**0.33**
BROMOCHLOROMETHANE	74-97-5	8.3	Tap Water RSL	2.8	1	0.75	0.33
BROMODICHLOROMETHANE	**75-27-4**	**0.13**	**Tap Water RSL**	**0.04**	**1**	**0.75**	**0.33**
BROMOFORM	75-25-2	3.3	Tap Water RSL	1.1	1	0.75	0.33
BROMOMETHANE	**74-83-9**	**0.75**	**Tap Water RSL**	**0.25**	**1**	**0.75**	**0.33**
CARBON DISULFIDE	75-15-0	81	Tap Water RSL	27	1	0.75	0.33
CARBON TETRACHLORIDE	**56-23-5**	**0.46**	**Tap Water RSL**	**0.15**	**1**	**0.75**	**0.33**
CHLOROBENZENE	108-90-7	7.8	Tap Water RSL	2.6	1	0.75	0.33
CHLOROETHANE	75-00-3	2100	Tap Water RSL	700	1	0.75	0.33
CHLOROFORM	**67-66-3**	**0.22**	**Tap Water RSL**	**0.07**	**1**	**0.75**	**0.33**
CHLOROMETHANE	74-87-3	19	Tap Water RSL	6.3	1	0.75	0.33
CIS-1,2-DICHLOROETHENE	156-59-2	3.6	Tap Water RSL	1.2	1	0.75	0.33
CIS-1,3-DICHLOROPROPENE[3]	**10061-01-5**	**0.47**	**Tap Water RSL**	**0.16**	**1**	**0.75**	**0.33**
CYCLOHEXANE	110-82-7	1300	Tap Water RSL	430	1	0.75	0.33
DIBROMOCHLOROMETHANE	**124-48-1**	**0.87**	**Tap Water RSL**	**0.29**	**1**	**0.75**	**0.33**
DICHLORODIFLUOROMETHANE	75-71-8	20	Tap Water RSL	6.7	1	0.75	0.33
ETHYLBENZENE	100-41-4	1.5	Tap Water RSL	0.5	1	0.75	0.33
ISOPROPYLBENZENE	98-82-8	45	Tap Water RSL	15	1	0.75	0.33
METHYL ACETATE	79-20-9	2000	Tap Water RSL	700	1	0.75	0.33
METHYL TERT-BUTYL ETHER	1634-04-4	14	Tap Water RSL	4.7	1	0.75	0.33

Analyte	CAS Number	PAL (µg/L)	PAL Reference[1]	PQLG (µg/L)	ALS Middleton		
		HHRA	HHRA		LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
METHYL CYCLOHEXANE	108-87-2	NC	None	NC	1	0.75	0.33
METHYLENE CHLORIDE	75-09-2	5	MCL	2	1	0.75	0.33
STYRENE	100-42-5	100	MCL	30	1	0.75	0.33
TETRACHLOROETHENE	127-18-4	4.1	MCL	1.4	1	0.75	0.33
TOLUENE	108-88-3	110	Tap Water RSL	37	1	0.75	0.33
TOTAL XYLENES	1330-20-7	19	Tap Water RSL	6.3	3	2.25	1
TRANS-1,2-DICHLOROETHENE	156-60-5	36	Tap Water RSL	12	1	0.75	0.33
TRANS-1,3- DICHLOROPROPENE[3]	**10061-02-6**	**0.47**	**Tap Water RSL**	**0.16**	**1**	**0.75**	**0.33**
TRICHLOROETHENE	**79-01-6**	**0.28**	**Tap Water RSL**	**0.09**	**1**	**0.75**	**0.33**
TRICHLOROFLUOROMETHANE	75-69-4	520	Tap Water RSL	170	1	0.75	0.33
VINYL CHLORIDE	**75-01-4**	**0.019**	**Tap Water RSL**	**0.006**	**1**	**0.75**	**0.33**

1 The PAL references for groundwater are the following: Tap Water RSL - Regional Screening Level for Tapwater (EPA, 2017c); MCL – USEPA Maximum Contaminant Level (2012).
2 The value for 1,4-dichlorobenzene was used for 1,3- dichlorobenzene.
3 The value for 1,3-dichloropropene has been used as surrogate for cis- and trans-1,3-dichloropropene.

Bolded rows indicate that the PAL is between the laboratory LOQ and DL. The Project Team has agreed to accept these data, as reported, for decision making.

Shaded and Bolded rows indicate the PAL is less than the DL. In these cases the Project Team has agreed to report non-detected results at the LOD and any limitations on data use that result from having detection limits that are greater than PALs will be described in the technical memorandum for Site 3 and Site 12.

Matrix: Groundwater
Analytical Group: Metals (Total and Dissolved)

Analyte	CAS Number	PAL (µg/L)	PAL Reference[1]	PQLG (µg/L)	ALS Middleton		
		HHRA	HHRA		LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
ALUMINUM[2]	7429-90-5	200	MCL	70	89	59	30
ANTIMONY	**7440-36-0**	**0.78**	**Tap Water RSL**	**0.26**	**2.2**	**1.5**	**0.74**
ARSENIC	**7440-38-2**	**0.052**	**Tap Water RSL**	**0.026**	**3**	**2**	**1**
BARIUM	7440-39-3	380	Tap Water RSL	130	5.6	3.7	1.9
BERYLLIUM	7440-41-7	2.5	Tap Water RSL	0.83	1	0.7	0.3
CADMIUM	**7440-43-9**	**0.92**	**Tap Water RSL**	**0.31**	**1.1**	**0.7**	**0.37**
CALCIUM	7440-70-2	NC	None	NC	111	73	37
CHROMIUM (total)	7440-47-3	100	MCL	33	2.2	1.5	0.74
COBALT	**7440-48-4**	**0.6**	**Tap Water RSL**	**0.2**	**5.6**	**3.7**	**1.9**
COPPER	7440-50-8	80	Tap Water RSL	30	5.6	3.7	1.9
IRON[2]	7439-89-6	300	MCL	100	56	37	19
LEAD	7439-92-1	15	MCL	5	2.2	1.5	0.74
MERCURY	**7439-97-6**	**0.063**	**Tap Water RSL**	**0.021**	**0.5**	**0.33**	**0.16**
MAGNESIUM	7439-95-4	NC	None	NC	111	73	37
MANGANESE	7439-96-5	43	Tap Water RSL	14	5.6	3.7	1.9
NICKEL	7440-02-0	39	Tap Water RSL	13	5.6	3.7	1.9
POTASSIUM	7440-09-7	NC	None	NC	111	73	37
SELENIUM	7782-49-2	10	Tap Water RSL	3	5.6	3.7	1.9

Analyte	CAS Number	PAL (µg/L)	PAL Reference[1]	PQLG (µg/L)	ALS Middleton		
		HHRA	HHRA		LOQ (µg/L)	LOD (µg/L)	DL (µg/L)
SILVER	7440-22-4	9.4	Tap Water RSL	.1	2.2	1.5	0.74
SODIUM[3]	7440-23-5	20000	Health Advisory	7000	111	73	37
THALLIUM	**7440-28-0**	**0.02**	**Tap Water RSL**	**0.007**	**1**	**0.7**	**0.3**
VANADIUM	7440-62-2	8.6	Tap Water RSL	2.9	2.2	1.5	0.74
ZINC	7440-66-6	600	Tap Water RSL	200	5.6	3.7	1.9

1 The PAL references for groundwater are the following: Tap Water RSL - Regional Screening Level for Tapwater (EPA, 2017c); MCL – USEPA Maximum Contaminant Level (2012).
2 Secondary MCLs are presented for Aluminum and Iron.
3 A Health Advisory is presented for Sodium.

Bolded rows indicate that the PAL is between the laboratory LOQ and DL. The Project Team has agreed to accept these data, as reported, for decision making.

Shaded and Bolded rows indicate the PAL is less than the DL. In these cases, the Project Team has agreed to report non-detected results at the LOD and any limitations on data use that result from having detection limits that are greater than PALs will be described in the technical memorandum for Site 3 and Site 12.

Matrix: Groundwater
Analytical Group: Radiological

Analyte	CAS Number	PAL (pCi/L)	PAL Reference[1]	PQLG (pCi/L)	ALS Fort Collins
		HHRA	HHRA		Minimum Detectable Concentration (MDC) picocuries per liter (pCi/L)
Radium-226	13982-63-3	0.0004	None	NC	1.0
Strontium-90	10098-97-2	0.065	Tap Water RSL	1600	1.0
Uranium-238	7440-61-1	0.00039	Tap Water RSL	7.7	0.2

1 The PAL references for radionuclides are the following: Preliminary Remediation Goals for Radionuclides (PRG) Internet Site (EPA, 2017d).

Shaded and Bolded rows indicate the PAL is less than the MDC. Any limitations on data use that result from having MDCs that are greater than PALs will be described in the technical memorandum for Site 3 and Site 12.

APPENDIX F
PCE TREND CHARTS

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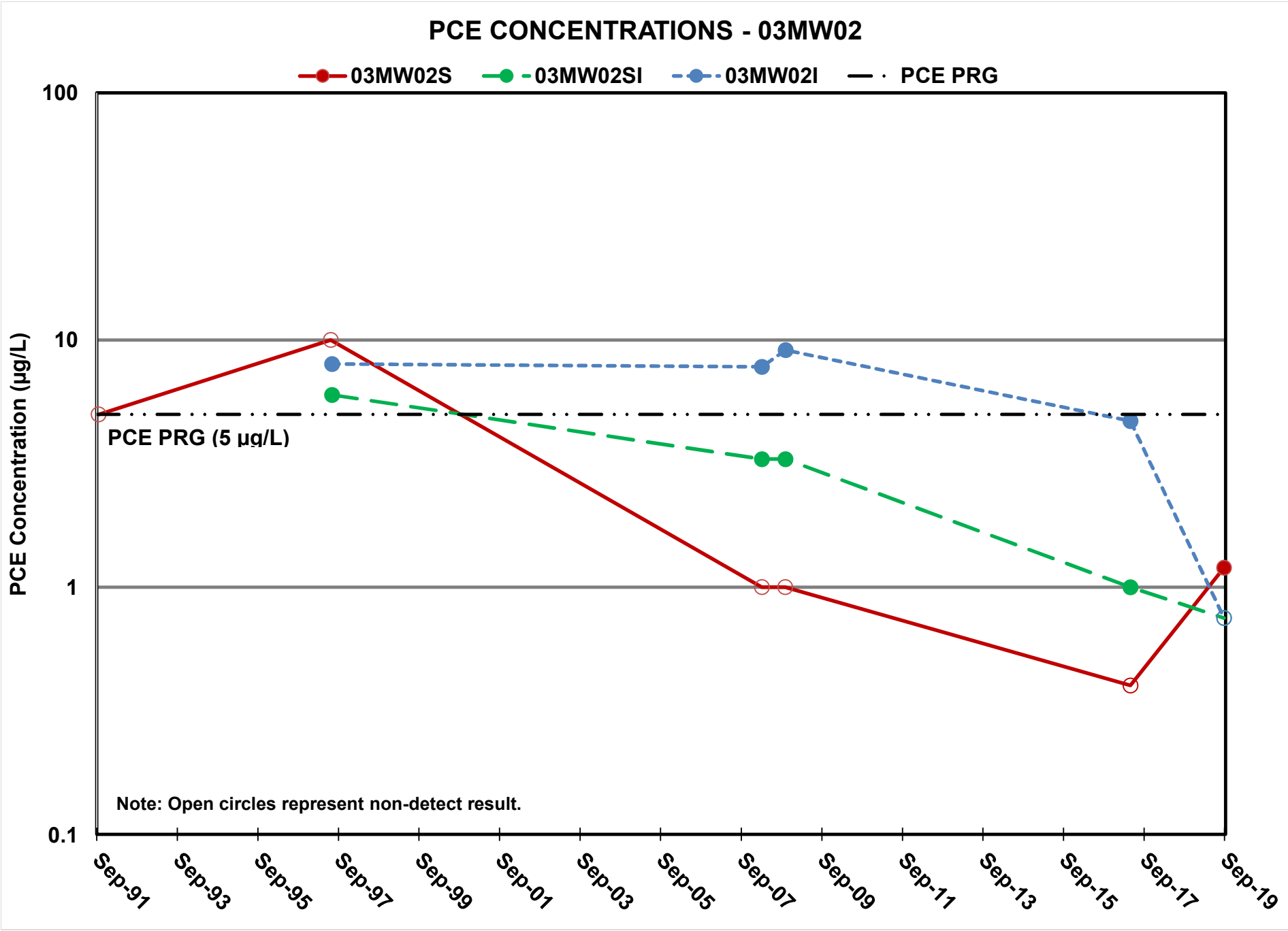
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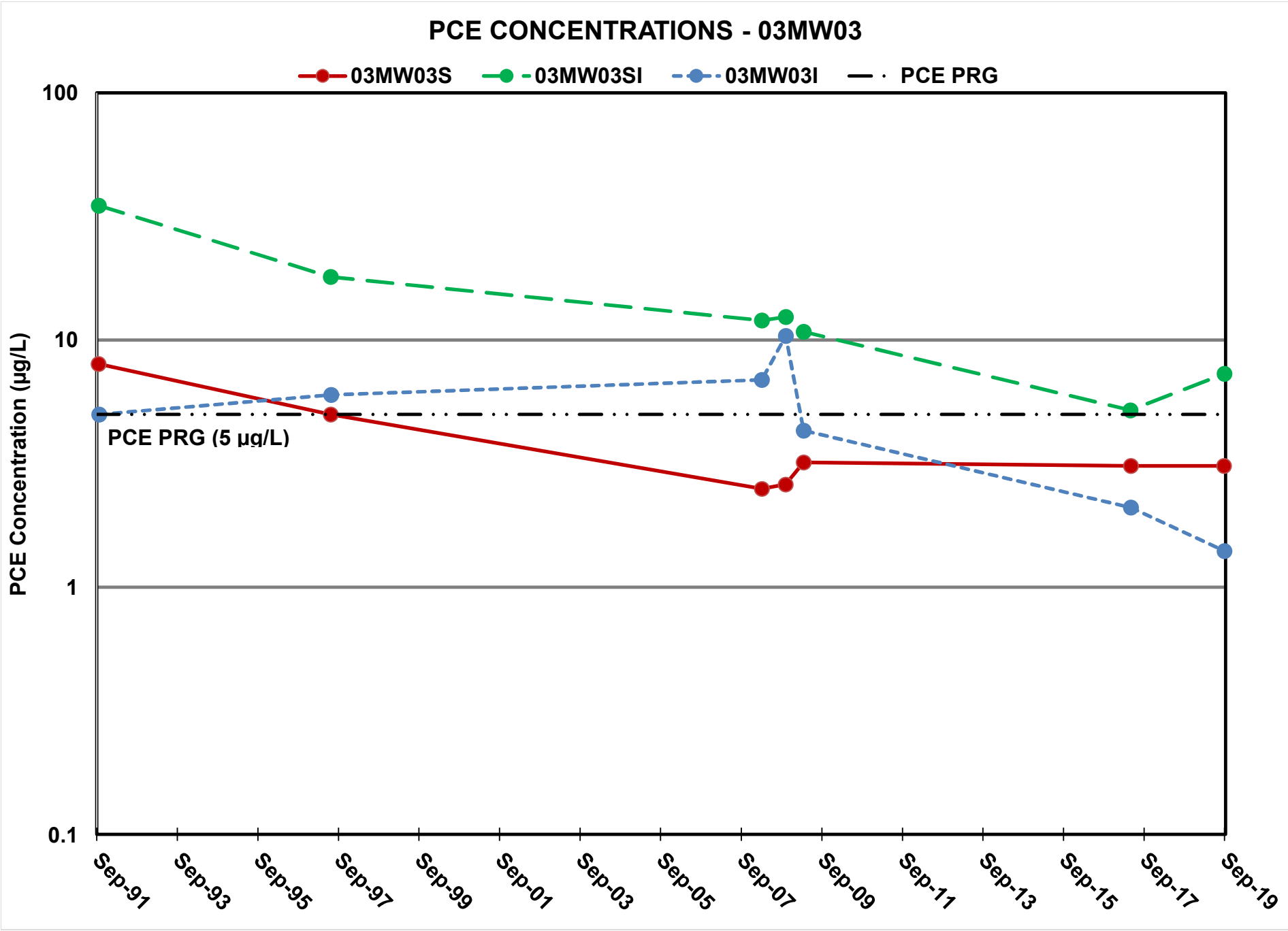
03MW02SI
03MW02I
PCE PRG
100
10
1
0.1
PCE Concentration (µg/L)
PCE PRG (5 µg/L)
Note: Open circles represent non-detect result.
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Sep-19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03MW03SI
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100
10
1
0.1
PCE Concentration (µg/L)
PCE PRG (5 µg/L)
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
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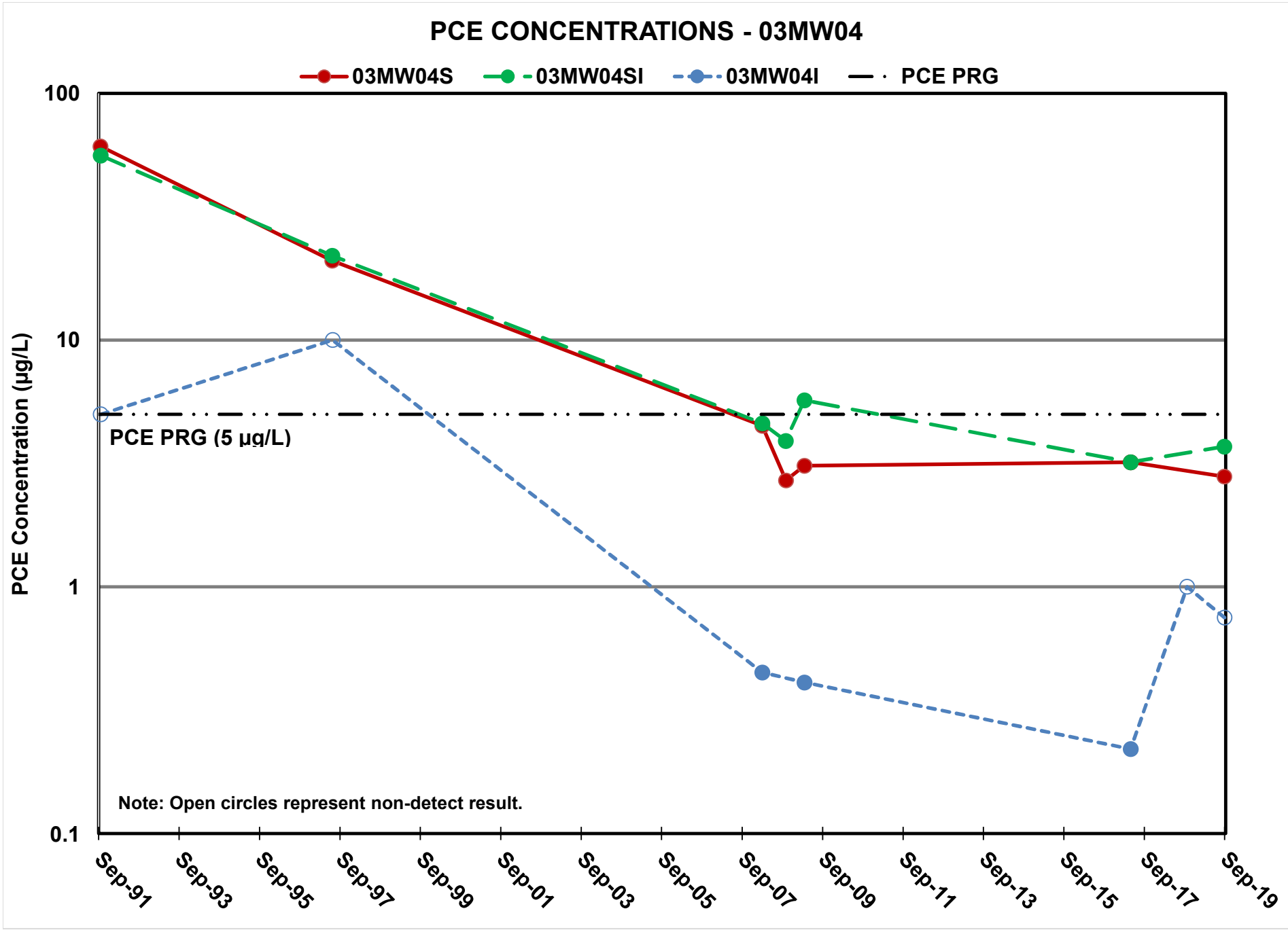
Sep-15
Sep-17
Sep-19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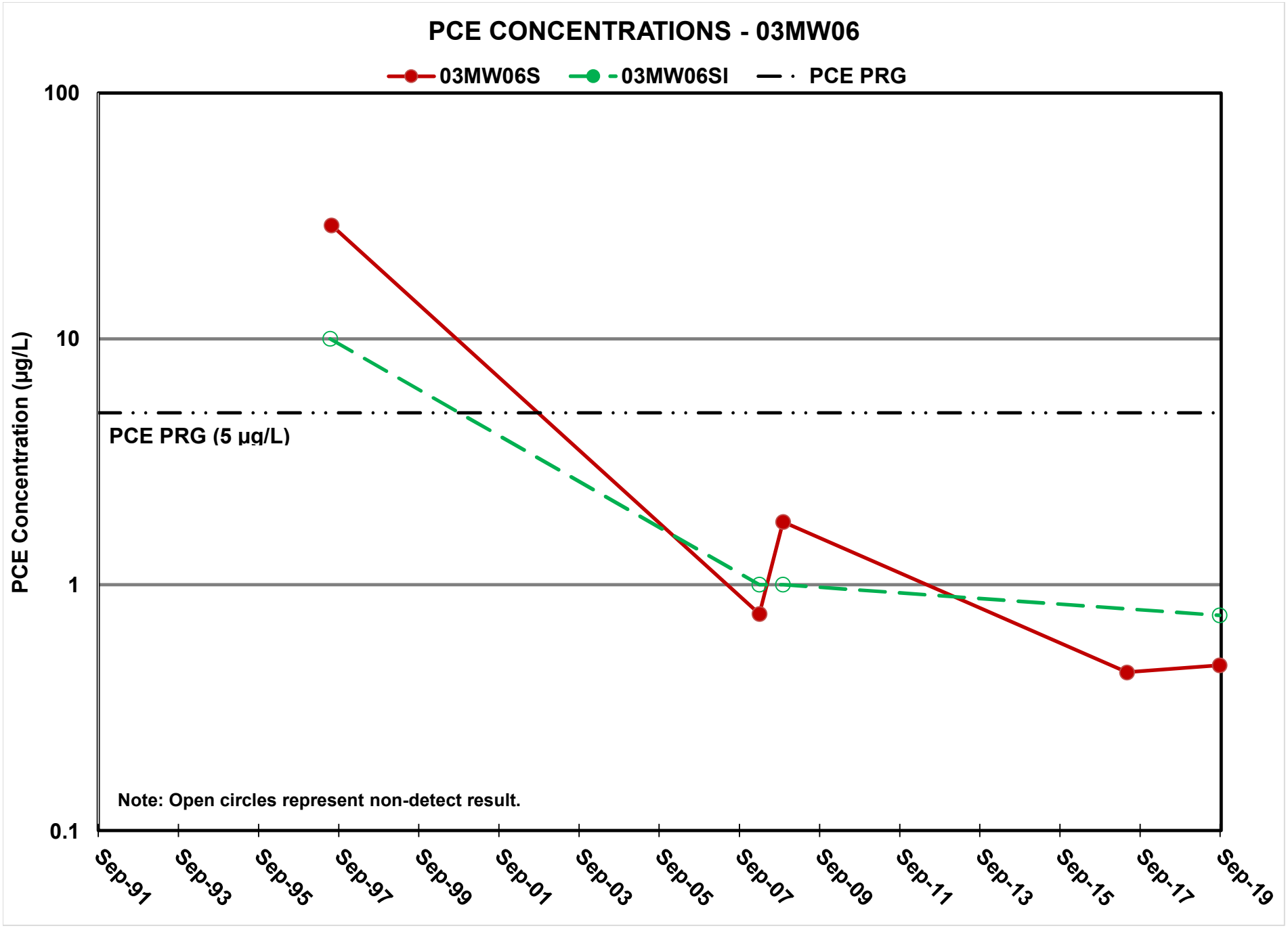
03MW04S
03MW04SI
03MW04I
PCE PRG
100
10
1
0.1
PCE Concentration (µg/L)
PCE PRG (5 µg/L)
Note: Open circles represent non-detect result.
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Sep-19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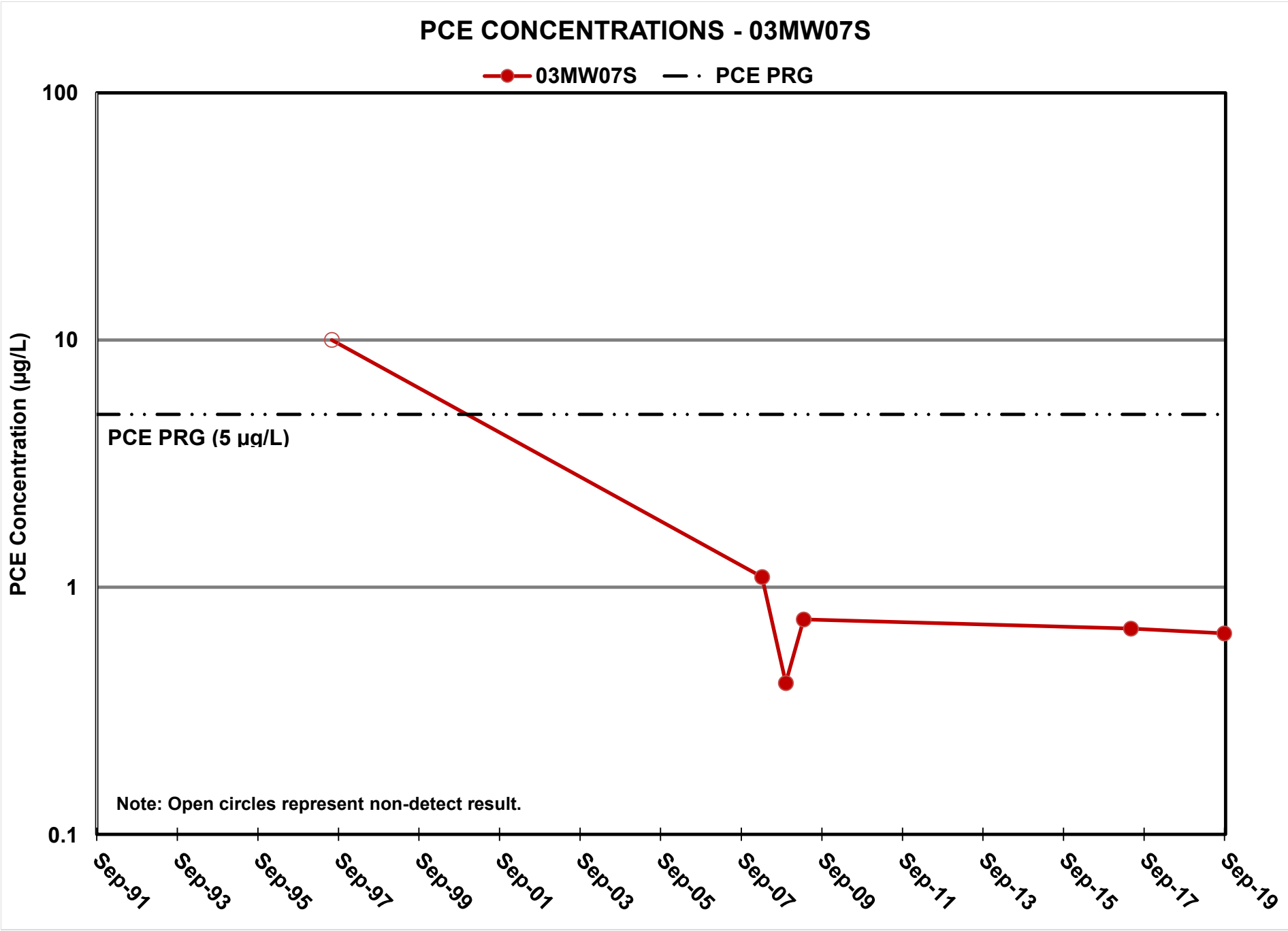
03MW06S
03MW06SI
PCE PRG
100
10
1
0.1
PCE Concentration (µg/L)
PCE PRG (5 µg/L)
Note: Open circles represent non-detect result.
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Sep-19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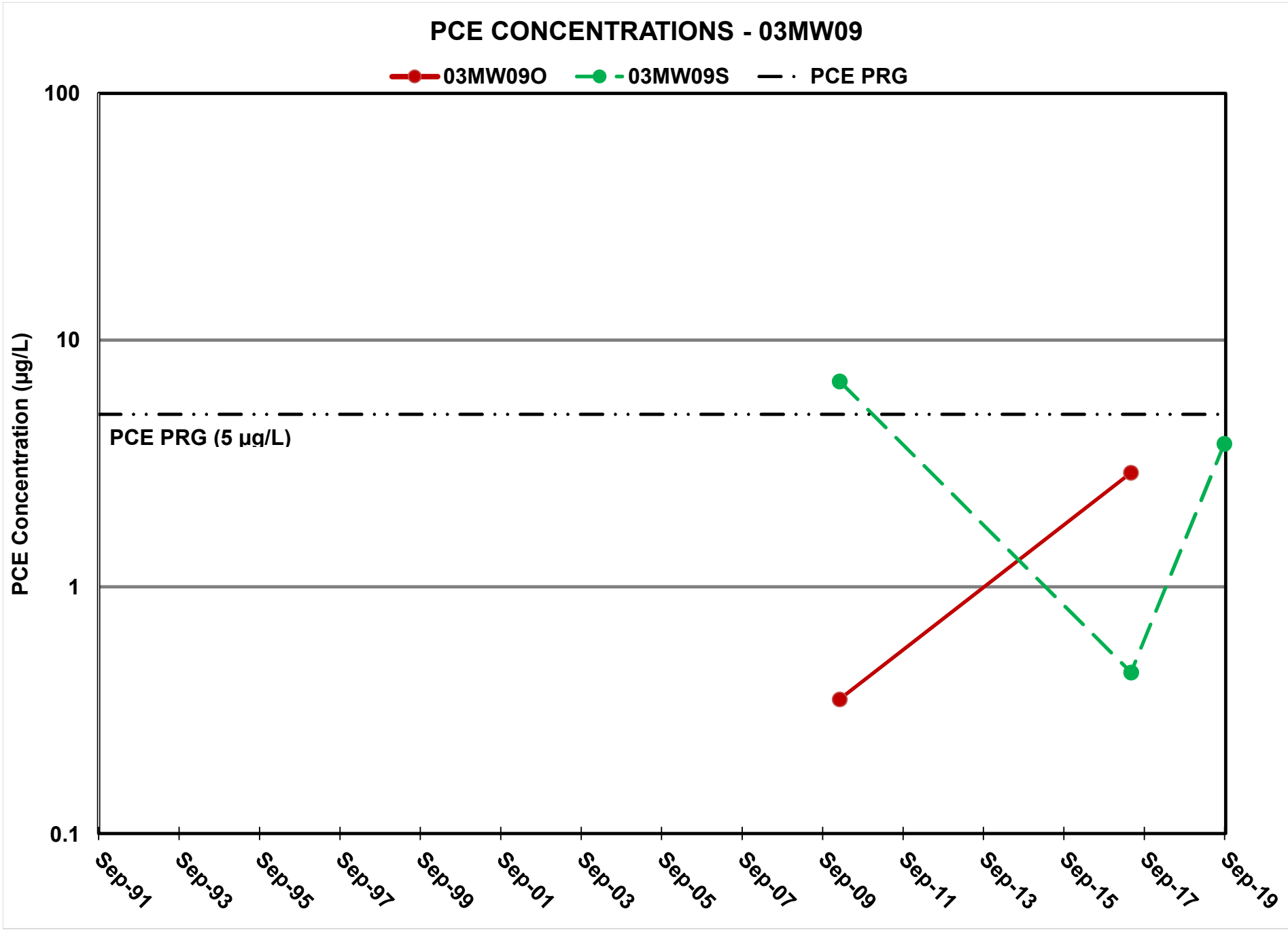
03MW07S
PCE PRG
100
10
1
0.1
PCE Concentration (µg/L)
PCE PRG (5 µg/L)
Note: Open circles represent non-detect result.
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
Sep-11
Sep-13
Sep-15
Sep-17
Sep-19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03MW09O
03MW09S
PCE PRG
100
10
1
0.1
PCE Concentration (µg/L)
PCE PRG (5 µg/L)
Sep-91
Sep-93
Sep-95
Sep-97
Sep-99
Sep-01
Sep-03
Sep-05
Sep-07
Sep-09
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Sep-13
Sep-15
Sep-17
Sep-19

APPENDIX G

DERIVED CONCENTRATIONS OF BETA AND PHOTON EMITTERS IN DRINKING WATER

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Derived Concentrations (pCi/l) of Beta and Photon Emitters in Drinking Water

Yielding a Dose of 4 mrem/yr to the Total Body or to any Critical Organ as defined in NBS Handbook 69

Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l
H-3	20,000	Ni-65	300	Nb-95	300	Sb-124	60	Nd-147	200	Os-191	600
Be-7	6,000	Cu-64	900	Nb-97	3,000	Sb-125	300	Nd-149	900	Os-191m	9,000
C-14	2,000	Zn-65	300	Mo-99	600	Te-125m	600	Pm-147	600	Os-193	200
F-18	2,000	Zn-69	6,000	Tc-96	300	Te-127	900	Pm-149	100	Ir-190	600
Na-22	400	Zn-69m	200	Tc-96m	30,000	Te-127m	200	Sm-151	1,000	Ir-192	100
Na-24	600	Ga-72	100	Tc-97	6,000	Te-129	2,000	Sm-153	200	Ir-194	90
Si-31	3,000	Ge-71	6,000	Tc-97m	1,000	Te-129m	90	Eu-152	200	Pt-191	300
P-32	30	As-73	1,000	Tc-99	900	Te-131m	200	Eu-154	60	Pt-193	3,000
S-35 inorg	500	As-74	100	Tc-99m	20,000	Te-132	90	Eu-155	600	Pt-193m	3,000
Cl-36	700	As-76	60	Ru-97	1,000	I-126	3	Gd-153	600	Pt-197	300
Cl-38	1,000	As-77	200	Ru-103	200	I-129	1	Gd-159	200	Pt-197m	3,000
K-42	900	Se-75	900	Ru-105	200	I-131	3	Tb-160	100	Au-196	600
Ca-45	10	Br-82	100	Ru-106	30	I-132	90	Dy-165	1,000	Au-198	100
Ca-47	80	Rb-86	600	Rh-103m	30,000	I-133	10	Dy-166	100	Au-199	600
Sc-46	100	Rb-87	300	Rh-105	300	I-134	100	Ho-166	90	Hg-197	900
Sc-47	300	Sr-85 m	20,000	Pd-103	900	I-135	30	Er-169	300	Hg-197m	600
Sc-48	80	Sr-85	900	Pd-109	300	Cs-131	20,000	Er-171	300	Hg-203	60
V-48	90	Sr-89	20	Ag-105	300	Cs-134	80	Tm-170	100	Tl-200	1,000
Cr-51	6,000	Sr-90	8	Ag-110m	90	Cs-134m	20,000	Tm-171	1,000	Tl-201	900
Mn-52	90	Sr-91	200	Ag-111	100	Cs-135	900	Yb-175	300	Tl-202	300
Mn-54	300	Sr-92	200	Cd-109	600	Cs-136	800	Lu-177	300	Tl-204	300
Mn-56	300	Y-90	60	Cd-115	90	Cs-137	200	Hf-181	200	Pb-203	1,000
Fe-55	2,000	Y-91	90	Cd-115m	90	Ba-131	600	Ta-182	100	Bi-206	100
Fe-59	200	Y-91m	9,000	In-113m	3,000	Ba-140	90	W-181	1,000	Bi-207	200
Co-57	1,000	Y-92	200	In-114m	60	La-140	60	W-185	300	Pa-230	600
Co-58	300	Y-93	90	In-115	300	Ce-141	300	W-187	200	Pa-233	300
Co-58m	9000	Zr-93	2,000	In-115m	1,000	Ce-143	100	Re-186	300	Np-239	300
Co-60	100	Zr-95	200	Sn-113	300	Ce-144	30	Re-187	9,000	Pu-241	300
Ni-59	300	Zr-97	60	Sn-125	60	Pr-142	90	Re-188	200	Bk-249	2,000
Ni-63	50	Nb-93m	1,000	Sb-122	90	Pr-143	100	Os-185	200		

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APPENDIX H
USEPA DIRECTIVE 9283.1-14

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV - 6 2001

Directive no. 9283.1-14

MEMORANDUM

SUBJECT: Use of Uranium Drinking Water Standards under 40 CFR 141 and 40 CFR 192 as Remediation Goals for Groundwater at CERCLA sites

FROM: Elaine F. Davies, Acting Director
Office of Emergency and Remedial Response (OERR)
Office of Solid Waste and Emergency Response

Stephen D. Page, Director
Office of Radiation and Indoor Air (ORIA)
Office of Air and Radiation

TO: Addressees

PURPOSE

This memorandum addresses the use of uranium standards in 40 CFR Part 141 and 40 CFR Part 192 when setting remediation goals for ground waters that are current or potential sources of drinking water at Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) sites. Today's memorandum will be of interest to site decisionmakers that have uranium as a contaminant of concern in groundwater at their CERCLA site.

This document provides guidance to Regional staff, in dealing with the public and the regulated community, regarding how EPA intends to implement the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). It describes national policy. This document is not a substitute for EPA's statutes or regulations, nor is it a regulation itself. Thus, it cannot impose legally-binding requirements on EPA, States, or the regulated community, and may not apply to a particular situation based upon the circumstances.

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BACKGROUND

All remedial actions at CERCLA sites must be protective of human health and the environment and comply with applicable or relevant and appropriate requirements (ARARs) unless a waiver is justified. Cleanup levels for response actions under CERCLA are developed based on site-specific risk assessments, ARARs, and/or to-be-considered material[1] (TBCs). The determination of whether a requirement is applicable, or relevant and appropriate, must be made on a site-specific basis (see 40 CFR §300.400(g)).

CERCLA GROUNDWATER PROTECTION

"EPA expects to return usable ground waters to their beneficial uses whenever practicable." (see 40 CFR §300.430(a)(1)(iii)(F)). In general, drinking water standards provide relevant and appropriate cleanup levels for ground waters that are a current or potential source of drinking water. However, drinking water standards generally are not relevant and appropriate for ground waters that are not a current or potential source of drinking water (see 55 FR 8732, March 8, 1990). Drinking water standards include federal maximum contaminant levels (MCLs) and/or non-zero maximum contaminant level goals (MCLGs) established under the Safe Drinking Water Act (SDWA), or more stringent state drinking water standards. Other regulations may also be ARARs as provided in CERCLA §121(d)(2)(B).

The Agency issued guidance concerning ground water use determinations in a memo from Office of Solid Waste and Emergency Response Assistant Administrator to the Regions entitled "The Role of CSGWPPs in EPA Remediation Programs" (OSWER Directive 9283.1-09), April 4, 1997. This guidance states that EPA generally defers to State determination of current and future groundwater uses, when the State has a Comprehensive State Ground Water Protection Program (CSGWPP) that has been endorsed by EPA and has provisions for site-specific decisions. For States that do not have an EPA-endorsed CSGWPP (or whose CSGWPPs do not have provisions for making site-specific determinations of groundwater use, resource value, priority or vulnerability), EPA uses either "EPA Guidelines for Ground-Water Classification" (Final Draft, December 1986), or State groundwater classifications or similar State designations, whichever classification scheme leads to more stringent remediation goals.

[1]To-be-considered material, TBCs include non-promulgated advisories or guidance issued by Federal or State governments that are not legally binding and do not have the status of potential ARARs. However, TBCs should be considered along with ARARs as part of the site risk assessment and may be used in determining the necessary level of cleanup for protection of health and the environment.

MASS AND ACTIVITY (pCi/L and µg/L)

Concentrations of radionuclides in water are typically expressed in terms of "activity" of the radionuclide per unit of volume in the water (e.g., picocuries per liter or pCi/L). Activity measures the rate of disintegration of a radionuclide per unit mass (for soil, sediment, and foodstuffs) or volume (for air and water). Because the carcinogenic effect of a radionuclide is due to its disintegration rate, which occurs during its decay process, concentrations of radionuclides are generally measured in terms of activity for health evaluation purposes.

Uranium is the only radionuclide for which the chemical toxicity has been identified to be comparable to or greater than the radiotoxicity, and for which a reference dose (RfD) has been established to evaluate chemical toxicity. The RfD is an estimate of a daily ingestion exposure to the population, including sensitive subgroups, that is likely to be without an appreciable risk of deleterious effects during a lifetime. Uranium in soluble form is a kidney toxin. The relative risk of uranium kidney toxin effects correspond to the level of exposure to the uranium mass concentrations; the oral RfD of uranium is expressed in terms of mass (0.6 µg/kg/day).

RADIONUCLIDE MCLs

On July 9, 1976, EPA promulgated 40 CFR Part 141 *Drinking Water Regulations: Radionuclides* (1976 MCL rule). This 1976 MCL rule included the following MCLs: 5 pCi/L for radium-226 and radium-228 combined; 15 pCi/L for gross alpha particle activity (including radium 226, but excluding uranium and radon); and a concentration that produces a dose equivalent of 4 mrem/yr or less to the total body or any internal organ for the sum of the doses from man-made beta particles and photon emitters. A list of radionuclides that are addressed by the gross alpha MCL are provided in Attachment A to today's memorandum. Also, provided in Attachment B to today's memorandum is a list of radionuclide concentrations calculated using the 4 mrem/yr beta particles and photon emitters MCL standard.

On December 7, 2000, EPA amended 40 CFR Part 141 (65 FR 76708, December 7, 2000) *National Primary Drinking Water Regulations; Radionuclides* (2000 MCL rule). This 2000 MCL rule established requirements for uranium, and retained the existing requirements for combined radium-226 and radium-228, gross alpha particle radioactivity, and beta particle and photon radioactivity. The 2000 MCL rule did include MCLGs of zero for the last four contaminants (see 40 CFR § 141.55).

The 2000 MCL rule established an MCL for uranium of 30 micrograms per liter (µg/L). For the MCL rulemaking, EPA assumed a typical conversion factor of 0.9 pCi/µg for the mix of uranium isotopes found at public water systems, which means that an MCL of 30 µg/L will typically correspond to 27 pCi/L. EPA considered the 30 µg/L level (which corresponds to a

27 pCi/L level) to be appropriate since it is protective for both kidney toxicity and cancer. However, the relationship between mass concentration (µg/L) and activity (pCi/L) is dependent upon the relative mix of the radioactive isotopes (e.g., uranium-234, uranium-235, uranium-238) that comprise the uranium at a particular drinking water source.[2] In circumstances with more extreme conversion factors (> 1.5 pCi/µg), uranium activity levels may exceed 40 pCi/L. In these circumstances, EPA recommends in the 2000 MCL rule that drinking water systems mitigate uranium levels to 30 pCi/L or less, to provide greater assurance that adequate protection from cancer health effects is being afforded (see 65 FR at page 76715).

UMTRCA GROUNDWATER STANDARDS

On January 11, 1995, EPA promulgated 40 CFR Part 192 (60 FR 2854, January 11, 1995) *Groundwater Standards for Remedial Actions at Inactive Uranium Processing Sites* (UMTRCA rule*)*.[3] Included in these standards is a constituent concentration limit for the combined level of uranium-234 and uranium-238 in groundwater. These standards were developed specifically for the cleanup of uranium mill tailings at 24 sites designated under Section 102(a)(1) of UMTRCA (Title I sites). The list of 24 Title I sites is a closed set chosen in 1979 that cannot be expanded without congressional action. The standards were developed to ensure that all currently used and reasonably expected drinking water supplies near these 24 sites, both public and private, are adequately protected for use by present and future generations. The concentration limit for the combined level of uranium-234 and uranium-238 is 30 pCi/L.

IMPLEMENTATION

The following subsections will clarify the use of standards under 40 CFR Part 141 and 40 CFR Part 192 as ARARs when setting remediation levels for uranium in groundwater at CERCLA sites.

MCLs AND UMTRCA AS APPLICABLE REQUIREMENTS

The uranium drinking water standards contained within 40 CFR Part 141 are potentially applicable requirements only for community water systems designated under § 141.26 (see 65 FR 76708, 76748 (December 7, 2000)). The uranium groundwater standards contained within

[2]For further discussion of mass and activity, including the formula to convert between the two measurement units, see U.S. EPA "Radiation Risk Assessment At CERCLA Sites: Q & A" EPA 540/R/99/006, December 1999, pp. 5-6.

[3]These standards were developed pursuant to Section 275 of the Atomic Energy Act (42 U.S.C. 2022), as amended by Section 206 of the Uranium Mill Tailings Radiation Control Act of 1978 (42 U.S.C. 7918) (UMTRCA).

40 CFR Part 192 are potentially applicable requirements only for the 24 Title I sites designated under Section 206 of UMTRCA.

MCLs AND UMTRCA AS RELEVANT AND APPROPRIATE REQUIREMENTS

In general, because the MCLG is zero for the radionuclides included in 40 CFR Part 141, the MCLs for these radionuclides are potentially relevant and appropriate requirements at sites with radioactive contamination in groundwaters that are current or potential sources of drinking water. In particular, **the uranium MCL of 30 µg/L is a potentially relevant and appropriate requirement for groundwaters that are current or potential sources of drinking water that have any of the uranium isotopes as a contaminant of concern**. Thus, for these radionuclides, the MCL concentration of 30 µg/L is generally used as the cleanup level for groundwater that is a current or potential source of drinking water, and is to be attained throughout the plume at the completion of the response action.

If either uranium-234 or uranium-238 is a contaminant of concern in ground waters that are current or potential sources of drinking water, and the site is not a Title I UMTRCA site, then the uranium UMTRCA standard under 40 CFR Part 192 of 30 pCi/L is a potentially relevant and appropriate requirement. Please note that this means both the uranium MCL (40 CFR Part 141) and the uranium UMTRCA (40 CFR Part 192) standards may be selected as relevant and appropriate requirements for addressing uranium contamination in ground water at the same CERCLA site. Since both standards establish levels of uranium in groundwater that are acceptable for drinking, EPA would expect that whenever the uranium UMTRCA ground water standard is a relevant and appropriate requirement, the uranium MCL will also be a relevant and appropriate standard. Selecting both the MCL and UMTRCA standards will ensure that the kidney toxicity and carcinogenic health effects posed by uranium are adequately addressed.

MCL PREAMBLE AS A TO-BE-CONSIDERED

In addition, the preamble recommendation to public water systems concerning extreme pCi/µg conversion factors in the uranium 2000 MCL rulemaking may be a TBC. **In situations where the mix of uranium isotopes means that attaining the uranium MCL of 30 µg/L may result in residual activity levels of uranium of greater than 40 pCi/L for total uranium, and a site-specific risk assessment demonstrates that 30 pCi/L is protective, then we recommend 30 pCi/L as a suitable cleanup level in addition to 30 µg/L.** This recommendation is made to ensure an equivalent level of protection from the carcinogenic effects of uranium at CERCLA sites and public water systems, and is therefore consistent with the recommendation made in the preamble to the 2000 MCL rule.

CONDUCTING GROUNDWATER RESPONSES FOR 40 CFR PART 141 AND/OR 40 CFR PART 192 ARAR COMPLIANCE

When either the uranium MCL and/or the 30 pCi/L uranium UMTRCA standard is considered a relevant and appropriate requirement, or the preamble to the uranium 2000 MCL rulemaking is a TBC, then CERCLA response actions should be conducted using the approach found in the NCP and Superfund guidance (e.g., determining groundwater use, point of compliance, areas of flexibility). Because the CERCLA approach for attaining the uranium MCL is more stringent than the UMTRCA approach 40 CFR Part 192, using the CERCLA approach automatically insures compliance with the UMTRCA groundwater standard as an ARAR. For example, the CERCLA approach for complying with the MCL throughout the plume is more stringent than the UMTRCA approach of complying with the groundwater standard only in the uppermost aquifer. Thus if an MCL is attained throughout the plume, the groundwater standard will also be attained in the uppermost aquifer. Key documents that include guidance on the Superfund approach to evaluating and remediating groundwater include: "Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites" (OSWER Directive No. 9283.1-12), October 1996; "The Role of CSGWPPs in EPA Remediation Programs" (OSWER Directive No. 9283.1-09), April 4, 1997, and; the "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites" (OSWER Directive No. 9200.4-17P), April 21, 1999). These and other Superfund groundwater guidance documents may be found on the Internet at: http://www.epa.gov/superfund/resources/gwdocs/index.htm.

Guidance documents that address establishing contaminant levels in soil to protect groundwater include: "Soil Screening Guidance for Radionuclides: User's Guide" (OSWER Directive No. 9355.4-16A), October 2000, and "Soil Screening Guidance for Radionuclides: Technical Background Document" (OSWER Directive No. 9355.4-16), October 2000. These Superfund guidance documents may be found on the Internet at: http://www.epa.gov/superfund/resources/radiation/radssg.htm.

FURTHER INFORMATION

The subject matter specialist for this directive is Stuart Walker of OERR 703-603-8748. General questions about this directive, should be directed to 1-800-424-9346.

Addressees:
National Superfund Policy Managers, Regions 1-10
Superfund Branch Chiefs, Regions 1-10
Superfund Branch Chiefs, Office of Regional Counsel, Regions 1-10
Radiation Program Managers, Regions 1, 4, 5, 6, 7, 10

Radiation Branch Chief, Region 2
Residential Domain Section Chief, Region 3
Radiation and Indoor Air Program Branch Chief, Region 8
Radiation and Indoor Office Director, Region 9
Federal Facilities Leadership Council
OERR Center Directors
OERR NARPM co-chairs
OERR Records Manager

cc:
Jim Woolford, FFRRO
Elizabeth Cotsworth, OSW
Craig Hooks, FFEO
Barry Breen, OSRE
Joanna Gibson, HOSC/OERR
Earl Salo, OGC
Jeff Josephson, Region 2

Attachment A: List of Man-made and Naturally-Occurring Radionuclides addressed by 15 pCi/L gross alpha particle activity MCL standard[4]

Nd-144	Ra-219	U-235
Sm-147	Ra-223	U-236
Sm-148	Ra-224	U-238
Po-208	Ra-226	Pa-231
Bi-210	Rn-220	Pu-236
Bi-211	Fr-221	Pu-238
Bi-212	Fr-223	Pu 239
Bi-213	Ac-225	Pu-240
Bi-214	Ac-227	Pu-241
Po-210	Th-227	Pu-242
Po-212	Th-228	Np-237
Po-213	Th-229	Am-241
Po-214	Th-230	Cm-242
Po-215	Th-232	Cm-244
Po-216	U-230	Cm-245
Po-218	U-232	Cm-248
At-217	U-233	Bk-248
At-218	U-234	Cf-250
Tl-217		

[4]This list includes only those radionuclides with half lives exceeding 4 days.

Attachment B: List of Radionuclides addressed by 4 mrem/yr man-made beta particles and photon emitters MCL standard[5]

Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	
H-3	20,000	Sr-85 m	20,000	Sb-124	60	Er-169	300
Be-7	6,000	Sr-85	900	Sb-125	300	Er-171	300
C-14	2,000	Sr-89	20	Te-125m	600	Tm-170	100
F-18	2,000	Sr-90	8	Te-127	900	Tm-171	1,000
Na-22	400	Sr-91	200	Te-127m	200	Yb-175	300
Na-24	600	Sr-92	200	Te-129	2,000	Lu-177	300
Si-31	3,000	Y-90	60	Te-129m	90	Hf-181	200
P-32	30	Y-91	90	Te-131m	200	Ta-182	100
S-35 inorg	500	Y-91m	9,000	Te-132	90	W-181	1,000
Cl-36	700	Y-92	200	I-126	3	W-185	300
Cl-38	1,000	Y-93	90	I-129	1	W-187	200
K-42	900	Zr-93	2,000	I-131	3	Re-186	300
Ca-45	10	Zr-95	200	I-132	90	Re-187	9,000
Ca-47	80	Zr-97	60	I-133	10	Re-188	200
Sc-46	100	Nb-93m	1,000	I-134	100	Os-185	200
Sc-47	300	Nb-95	300	I-135	30	Os-191	600
Sc-48	80	Nb-97	3,000	Cs-131	20,000	Os-191m	9,000
V-48	90	Mo-99	600	Cs-134	80	Os-193	200
Cr-51	6,000	Tc-96	300	Cs-134m	20,000	Ir-190	600
Mn-52	90	Tc-96m	30,000	Cs-135	900	Ir-192	100
Mn-54	300	Tc-97	6,000	Cs-136	800	Ir-194	90
Mn-56	300	Tc-97m	1,000	Cs-137	200	Pt-191	300
Fe-55	2,000	Tc-99	900	Ba-131	600	Pt-193	3,000
Fe-59	200	Tc-99m	20,000	Ba-140	90	Pt-193m	3,000
Co-57	1,000	Ru-97	1,000	La-140	60	Pt-197	300
Co-58	300	Ru-103	200	Ce-141	300	Pt-197m	3,000
Co-58m	9000	Ru-105	200	Ce-143	100	Au-196	600
Co-60	100	Ru-106	30	Ce-144	30	Au-198	100
Ni-59	300	Rh-103m	30,000	Pr-142	90	Au-199	600
Ni-63	50	Rh-105	300	Pr-143	100	Hg-197	900
Ni-65	300	Pd-103	900	Nd-147	200	Hg-197m	600
Cu-64	900	Pd-109	300	Nd-149	900	Hg-203	60
Zn-65	300	Ag-105	300	Pm-147	600	Tl-200	1,000
Zn-69	6,000	Ag-110m	90	Pm-149	100	Tl-201	900
Zn-69m	200	Ag-111	100	Sm-151	1,000	Tl-202	300
Ga-72	100	Cd-109	600	Sm-153	200	Tl-204	300

[5]For those isotopes where an MCL is calculated, concentration values were rounded using the same format as EPA guidance for the 1976 MCL rulemaking.

Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	pCi/l	Nuclide	
Ge-71	6,000	Cd-115	90	Eu-152	200	Pb-203	1,000
As-73	1,000	Cd-115m	90	Eu-154	60	Bi-206	100
As-74	100	In-113m	3,000	Eu-155	600	Bi-207	200
As-76	60	In-114m	60	Gd-153	600	Pa-230	600
As-77	200	In-115	300	Gd-159	200	Pa-233	300
Se-75	900	In-115m	1,000	Tb-160	100	Np-239	300
Br-82	100	Sn-113	300	Dy-165	1,000	Pu-241	300
Rb-86	600	Sn-125	60	Dy-166	100	Bk-249	2,000
Rb-87	300	Sb-122	90	Ho-166	90		