2020 MarkAir Warehouse Groundwater Monitoring with Enhanced Monitored Natural Attenuation Report

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Prepared for:
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TABLE OF CONTENTS

SECTION **PAGE**

TABLE OF CONTENTS (Continued)

SECTION **PAGE**

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ºC	degrees Celsius
µg/L	micrograms per liter
µS/cm	microSiemens per centimeter
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
APS	adenosite-5'-phosphosulfate reductase (sulfate-reducing bacteria)
ASCWG	Alaska Statement of Cooperation Working Group
bgs	below ground surface
BSS	benzyl succinate synthase
btoc	below top of casing
BTEX	benzene, toluene, ethylbenzene, xylenes
cells/mL	cells per milliliter
CSM	conceptual site model
DL	detection limit
DO	dissolved oxygen
DOT&PF	Alaska Department of Transportation & Public Facilities
DRO	diesel-range organics
EDB	1,2-dibromoethane
EDC	1,2-dichloroethane
EPA	U.S. Environmental Protection Agency
FAI	Fairbanks International Airport
GCL	groundwater cleanup level
GRO	gasoline-range organics
Jacobs	Jacobs Engineering Group Inc.
LOD	limit of detection
LOQ	limit of quantitation
MAW	MarkAir Warehouse
MDC	maximum detected concentration
mg/L	milligrams per liter
MNA	monitored natural attenuation
MS/MSD	matrix spike/matrix spike duplicate
mV	millivolts
MW	monitoring well
ND	nondetect
NTU	nephelometric turbidity units
ORP	oxidation-reduction potential

ACRONYMS AND ABBREVIATIONS (Continued)

PAH	polycyclic aromatic hydrocarbon
QC	quality control
RRO	residual-range organics
SGS	SGS Environmental Laboratory Services
UST	underground storage tank
VOC	volatile organic compound
YSI	Yellow Springs Instruments

EXECUTIVE SUMMARY

The Alaska Department of Transportation & Public Facilities (DOT&PF) requested groundwater monitoring at the Alaska Department of Environmental Conservation (ADEC) Fairbanks International Airport (FAI) MarkAir Warehouse (MAW) contaminated site (File No. 100.26.043, Hazard ID 22871), located at the FAI in Fairbanks, Alaska (Figure A-1, Appendix A). At the request of DOT&PF, Jacobs Engineering Group Inc. conducted groundwater monitoring on 15 and 16 December 2020.

During the project, seven monitoring wells were visited for well integrity inspections, surveying of groundwater elevations, and groundwater sampling. These included monitoring wells MW-3, MW-5, MW-8, MW-9, MW-10, MW-12, and MW-17. Samples collected from all monitoring wells during the monitoring event were submitted to the laboratory for analysis of gasoline-range organics (GRO) using ADEC Method AK101, diesel-range organics (DRO) using ADEC Method AK102, and residual-range organics using ADEC Method AK103. In addition, samples from monitoring wells MW-3, MW-5, MW-9, MW-12 and MW-17 were submitted for benzene, toluene, ethylbenzene and xylenes (BTEX) using U.S. Environmental Protection Agency (EPA) Method SW8021B; samples from MW-8 and MW-10 were submitted for analysis of volatile organic compounds by EPA Method SW8260D; and polyaromatic hydrocarbons via EPA Method SW8270D-SIM. Samples collected at MW-8, MW-9, MW-10, MW-12, and MW-17 were also analyzed for 1,2-dibromoethane (EDB) and 1,2-dichloroethane (EDC) via EPA Method SW8260D.

Additional sampling of groundwater took place from four wells (MW-5, MW-8, MW-10, and MW-12) to conduct a gene analysis of the microbial community to monitor the growth of sulfate-reducing bacteria population and to collect monitored natural attenuation (MNA) parameters. Samples collected for MNA were submitted for analysis of manganese and iron via EPA Method 6020A, methane via RSK 175, sulfate via EPA Method 300.0, total nitrite and nitrate via SM21 4500NO3-F, and total phosphorous by SM21 4500P-B,E. A Mann-Kendall trend analysis of groundwater sampling results was conducted to aid in recommendations for further monitoring and remediation activities. Remedial injection of nutrient mixtures for

enhanced MNA was postponed due to cold temperatures significantly below freezing that could severely inhibit mixing and injection of the water-based mix.

Analytical results were screened against the groundwater cleanup levels (GCLs) listed in Table C of the Alaska Administrative Code Title 18, Chapter 75, *Oil and other Hazardous Substances Pollution Control* (ADEC 2020b). Results of the sampling event indicated the following exceedances of ADEC GCLs in groundwater at the specified monitoring wells:

- GRO in MW-8 and MW-10
- DRO in MW-10 and MW-17
- RRO in MW-10 and MW-17
- Naphthalene, 1,2,4-trimethylbenzene (TMB), EDB, benzene, ethylbenzene, and xylenes in MW-10 and MW-8
- 1-methylnaphthalene, 2-methylnaphthalene, and 1,3,5-TMB in MW-10 (Figure A-2, Appendix A)
- EDC in MW-8

Results of MNA sampling indicated manganese concentrations above ADEC GCLs in MW-8, MW-10, and MW-12.

Results of a Mann-Kendall trend analysis of contaminant concentrations indicated DRO concentrations are decreasing in monitoring well MW-3, increasing in monitoring well MW-10, and stable in the rest of the sampled wells at the MAW site. No trend in contaminant concentration data was observed for EDC in monitoring well MW-8 or for EDB in MW-10. The analysis also showed the rest of the contaminants in the seven sampled wells were stable.

The genetic analysis of four wells indicated microbe concentrations and gene biodegradation pathways are available on site. Comparisons of these results with historical results for benzyl succinate synthase and sulfate-reducing bacteria show similarities to population concentrations since monitoring began in 2012.

Recommendations at the DOT&PF FAI MAW site include continuation of biennial groundwater monitoring and remedial injection of nutrient mixtures for enhanced MNA in coordination with ADEC until ADEC determines that further monitoring is not required.

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1.0 INTRODUCTION

The Alaska Department of Transportation & Public Facilities (DOT&PF) contracted Jacobs Engineering Group Inc. (Jacobs) to perform biennial groundwater monitoring activities at the Fairbanks International Airport (FAI) MarkAir Warehouse (MAW) contaminated site, Alaska Department of Conservation (ADEC) No. 100.26.043 and Hazard ID 22871. Sampling activities at the MAW site are outlined in the ADEC-approved work plan prepared in November 2020 (DOT&PF 2020). This report has been prepared on behalf of the DOT&PF to document the objectives and scope of work associated with the sampling event, field activities that occurred in December 2020, as well as the analytical results, findings, conclusions and recommendations for the MAW site.

1.1 PROJECT OBJECTIVES

In December 2020, Jacobs field staff performed groundwater monitoring at the DOT&PF FAI MAW site. Objectives of the 2020 MAW groundwater monitoring field effort included the following:

- Collecting groundwater samples at seven existing groundwater monitoring wells (MW-3, MW-5, MW-8, MW-9, MW-10, MW-12, and MW-17) for analysis of fuel-related constituents, monitored natural attenuation (MNA) parameters, and microbial community
- Surveying groundwater elevations and conducting repairs at the seven wells
- Performing remedial activities for enhanced MNA, to include:
  - Injection of nutrient mixtures (sulfate, nitrate/nitrite, and phosphorous) into six wells (IW-1, IW-2, IW-3, IW-4, MW-10, and MW-17) during two separate events to promote growth of sulfate-reducing bacteria to continue biodegradation of fuel-related contaminants in soil and water
  - Sampling groundwater from four monitoring wells (MW-5, MW-8, MW-10, and MW-12) to conduct a gene analysis of the microbial community to monitor the growth of sulfate-reducing bacteria population
- Performing a Mann-Kendall trend analysis of groundwater sampling results
- Reporting on field activities conducted and results of the groundwater monitoring and remedial activities
- Developing recommendations for further monitoring and remediation activities

1.2 SITE DESCRIPTION

The MarkAir Warehouse site, also known as the Former Weaver Brothers Facility, is located northwest of the FAI runways at the southwest corner of the Mail Trail Road and Airport Industrial Road intersection (ADEC 2020a) (Figure A-1). The site is located within the Fairbanks Meridian, Township 1 South, Range 2 West, Section 13 and consists of lots 6, 7, and 13 of block 10. The property is owned by the DOT&PF and is operated/managed by FAI. Based on previous monitoring reports, groundwater depth varies between approximately 6 and 12 feet below ground surface (bgs), and groundwater flow direction is to the northwest (DOT&PF 2017) (Figure A-2).

1.3 SITE HISTORY

The source of the contamination at the MAW site originated from leaking and overfilled underground storage tanks (USTs) that were installed in 1976. The leaks were discovered during tank tightness tests and subsequent removal activities in 1992. USTs and associated pipes were grouted in place where removal was not practicable, and contaminated soil was also removed in this 1992 effort. Between 1993 and 2005, several investigations to characterize and delineate contamination in soil and groundwater were performed (DOT&PF 2018).

The following paragraphs summarize historical environmental investigations that have occurred at the MAW site in response to the initial discovery of contamination. The results of the historical investigations have been re-screened against ADEC groundwater cleanup levels (GCLs) listed in Alaska Administrative Code (AAC) Title 18, Chapter 75 (18 AAC 75), (ADEC 2020b) for the purpose of comparison to the 2020 groundwater monitoring results and are described below. References to GCLs throughout this report imply ADEC GCLs listed in 18 AAC 75 unless otherwise specified.

In 2004, benzene, volatile organic compounds (VOCs), 1,2-dibromoethane (EDB), and 1,2-dichloroethane (EDC) were detected at concentrations greater than GCLs at monitoring well MW-8. Additionally, elevated concentrations of petroleum hydrocarbons were detected in subsurface soil near MW-8 (DOT&PF 2018).

In 2005, groundwater samples were collected from seven select groundwater monitoring wells and temporary well points. Results indicated petroleum hydrocarbon concentrations greater than ADEC GCLs in four of the seven groundwater samples (DOT&PF 2018).

In 2006, groundwater samples were collected from four separate groundwater monitoring wells, and a soil-gas survey was conducted at the north end of the MAW site. Passive soil-gas canisters were installed in a 50-foot gridded network. The results indicated two diesel-range organics (DRO) "hotspots" and one BTEX hotspot (ADEC 2020a).

In 2008, six monitoring wells were installed along the western property boundary of the MAW site, two soil borings were advanced at the DRO hotspots identified in 2006, and one soil boring and one monitoring well were advanced/installed at the BTEX hotspot. Benzene was detected at concentrations greater than GCLs in a newly installed monitoring well, MW-12, located along the western boundary of the property, near tax parcel lot TL-2321. No other contaminant concentrations exceeded the ADEC GCLs at MW-12. BTEX contamination was identified in soil and groundwater at MW-16, also installed in 2008, indicating an unknown source of contamination (ADEC 2020a).

In 2010, additional groundwater monitoring to investigate sources of contamination at monitoring well MW-16 included a nearby well search. Groundwater was sampled from all wells at the MAW site and analyzed for contaminants and biogeochemical indicators. A vapor intrusion study was also conducted, and the conceptual site model (CSM) for the site was updated. Findings from the groundwater monitoring event indicated volatile contaminants at concentrations lower than during the previous sampling event (ADEC 2020a).

In March 2012, ADEC recommended enhanced MNA to remediate residual groundwater and soil contamination. Field work in 2012 included baseline groundwater sampling and injection of a sulfate-nutrient solution followed by three months of performance monitoring. An increase in the population of sulfate-reducing bacteria in groundwater downgradient from the injection wells was concluded (DOT&PF 2018).

In 2013, a meeting between DOT&PF, the DOT&PF consultant, and ADEC occurred. The meeting resulted in a plan for future groundwater monitoring. Several wells where contamination had never been detected at concentrations exceeding ADEC GCLs were to be decommissioned. Other groundwater monitoring wells to remain in the monitoring network would be sampled for gasoline-range organics (GRO), BTEX, MNA parameters, and sulfate-reducing microbes to determine a baseline prior to performing additional sulfate-nutrient solution injections (ADEC 2020a). Results of the 2013 injections and monitoring process indicated anaerobic processes were continuing to reduce contaminant concentrations in groundwater (DOT&PF 2018).

In 2016, baseline groundwater monitoring was conducted that included analysis of microbial communities to identify petroleum hydrocarbon degraders, as well as groundwater sampling for contaminant concentrations (ADEC 2020a). Results indicated increasing populations of sulfate-reducing bacteria in groundwater and stable and decreasing groundwater contaminant concentrations. Due to reduced concentrations of contaminants, monitoring wells MW-4, MW-11, MW-14, and MW-15 were removed from the monitoring program, and biennial groundwater monitoring was recommended (DOT&PF 2018).

In 2018, baseline groundwater sampling was performed at monitoring wells MW-3, MW-5, MW-8, MW-9, MW-10, MW-12, and MW-17, and nutrient-sulfate solution injections occurred at injection wells IW-1, IW-2, IW-3, and IW-4 and monitoring wells MW-10 and MW-17. Results of the groundwater sampling event indicated GRO, VOCs (naphthalene and trimethylbenzene (TMB) isomers), BTEX, and polycyclic aromatic hydrocarbons (PAHs) (1- and 2-methylnaphthalene and naphthalene) at concentrations greater than ADEC GCLs in monitoring wells MW-8 and MW-10. In addition, DRO concentrations exceeded ADEC GCLs in monitoring wells MW-10 and MW-17, and benzene exceeded GCLs in monitoring well MW-17 (DOT&PF 2018). The report recommended continuation of biennial sampling, monitoring, gene census analyses, remedial injection, and discontinuation of supplemental carbon injection. (DOT&PF 2018).

2.0 FIELD ACTIVITIES

From 15 through 16 December 2020, Guy Wade (project manager) and Karri Sicard (geologist) visited the DOT&PF FAI MAW site to conduct biennial groundwater monitoring activities. Groundwater monitoring activities included inspection of monitoring wells for integrity, depth to groundwater measurement, and collection of groundwater samples from seven groundwater monitoring wells (MW-3, MW-5, MW-8, MW-9, MW-10, MW-12, and MW-17). The Jacobs sampling staff are ADEC-qualified samplers as defined in 18 AAC 75 (ADEC 2020b). Field activities were performed in accordance with the *2020 MarkAir Warehouse Groundwater Monitoring with Enhanced Monitored Natural Attenuation Work Plan* (WP) (DOT&PF 2020) and the ADEC *Field Sampling Guidance* (ADEC 2019). Field notes from sampling activities were recorded in a logbook and can be found in Appendix C. Section 2.0 details activities conducted during the 2020 monitoring effort.

2.1 WORK PLAN DEVIATIONS

Remedial injection of nutrient mixtures for enhanced MNA was intended to occur concurrent to groundwater monitoring. However, due to the late field season and cold temperatures that would inhibit biodegradation of fuel-related contaminants in soil and groundwater, this injection has been postponed until Spring 2022. Activities associated with nutrient injection in Spring 2022 will be reported in a separate technical memorandum once the activities are complete or included in the report after the 2022 groundwater monitoring event.

The WP (DOT&PF 2020) indicates that samples collected from monitoring wells MW-8 and MW-10 were to be analyzed for BTEX via SW8021B. However, because the samples collected from these wells also required VOC analysis, which includes BTEX, via U.S. Environmental Protection Agency (EPA) Method SW8260D, samples were not analyzed for BTEX via EPA Method SW8021B. Use of this methodology is consistent with historical sampling efforts at these monitoring wells.

2.2 GROUNDWATER MONITORING

Groundwater samples were collected from the following seven monitoring wells on 15 and 16 December 2020: MW-3, MW-5, MW-8, MW-9, MW-10, MW-12, and MW-17 (Figure A-2). The rationale for sampling these seven wells is as follows:

- Monitoring wells MW-3, MW-5, MW-8, MW-9, MW-10, MW-12, and MW-17 were sampled for analysis of fuel-related constituents to monitor for contaminants and MNA parameters (MW-5, MW-8, MW-10, and MW-12 only), to identify contaminant concentration trends using prior GRO, DRO, and BTEX data.
- Groundwater from monitoring wells MW-5, MW-8, MW-10, and MW-12 was also sampled to conduct a gene analysis of the microbial community to monitor the growth of sulfate-reducing bacteria population.

Groundwater sampling was conducted in general accordance with the Jacobs standard operating procedures in the WP (DOT&PF 2020) and the low-flow sample techniques described in the ADEC *Field Sampling Guidance* (ADEC 2019). Groundwater samples were collected using a bladder pump. Prior to sampling, an in-line flow-through cell and multi-parameter water quality meter (e.g., Yellow Springs Instruments (YSI) 556) were used to measure the following water quality parameters at 3- to 5-minute increments during well purging. Measured water quality parameters included temperature, pH, specific conductance, dissolved oxygen (DO), and oxidation-reduction potential (ORP). Turbidity and well drawdown were also measured during purging using a turbidity meter and water level meter, respectively. For accurate and comprehensive record keeping, personnel followed Jacobs' sample documentation and naming protocol (DOT&PF 2020).

Groundwater samples collected from all wells were submitted to SGS Environmental Laboratory Services (SGS) for analytical testing of the following contaminants: GRO by ADEC Method AK101; DRO by ADEC Method AK102; and residual-range organics (RRO) by ADEC Method AK103. Samples collected from monitoring wells MW-3, MW-5, MW-9, MW-12, and MW-17 were also submitted for analysis of BTEX by EPA Method SW8021B and groundwater samples collected from monitoring wells MW-8 and MW-10 were analyzed for VOCs via EPA Method SW8260D and PAHs via EPA Method SW8270D-SIM. Samples collected from monitoring wells MW-8, MW-9, MW-10, MW-12, and MW-17 were analyzed for EDB via

Method SW8260D-SIM and EDC via Method SW8260D. For quality control (QC), one field duplicate was collected for each of the required analytical methods. In addition, one trip blank was included for the analysis of volatiles (GRO, BTEX, VOCs, EDB, and EDC).

No free petroleum product was measured in these seven monitoring wells. Analytical groundwater samples were collected once water quality parameters stabilized. Water quality parameters were considered stable once three of the five parameters, excluding temperature, had met stability criteria for three successive readings, per the WP (DOT&PF 2020). The bladder pump intake depth was set to within 1 foot of the top of static groundwater within each monitoring well during sample collection, except at MW-12, where the intake was set to 1.13 feet below the static water level. Groundwater samples were collected into containers provided by the laboratory in the following analyte order: volatiles (GRO, BTEX, VOCs, EDB, and/or EDC) and then DRO/RRO. Groundwater samples were collected for analysis of MNA parameters and microbial communities (described in Sections 2.2.1 and 2.2.2) once sample collection for analysis of contaminants of concern was completed. Groundwater sampling data sheets corresponding to monitoring wells sampled in 2020 are presented in Appendix D. Final water quality parameters of all wells are presented in Section 5.2.

2.2.1 Monitored Natural Attenuation

In addition to monitoring groundwater for contaminants, groundwater samples collected from monitoring wells MW-5, MW-8, MW-10, and MW-12 were analyzed for specific parameters to assess natural attenuation and to help predict the future success of remedial injection in decreasing fuel-related contaminants. MNA parameter analyses include manganese and iron via EPA Method SW6020B, methane via RSK 175, sulfate via EPA Method 300.0, total nitrate and nitrite via SM21 4500NO3-F, and total phosphorous via SM21 4500P-B,E.

2.2.2 Microbial Community Analysis

Microbial communities at the MAW site were evaluated to determine the genetic biodegradation potential of petroleum hydrocarbon contaminants. To assess the microbial communities, groundwater samples were collected for QuantArray-Petroleum analysis, which

targeted 22 genes responsible for aerobic and anaerobic biodegradation pathways of BTEX, PAHs, oxygenates, and alkanes (Microbial Insights 2017). Approximately one liter of water was passed through a small groundwater filter, from each of the following four wells: MW-5, MW-8, MW-10, and MW-12 (Figure A-2). The filter containing the microbes for each well was then shipped to Microbial Insights for QuantArray-Petroleum analysis.

Groundwater samples for microbial community analysis were collected after collection of samples for contaminant and MNA parameter analyses. Each microbial community sample was collected using a bladder pump and Bio-Flo filters in accordance with the WP (DOT&PF 2020).

2.3 WELL MAINTENENCE

Jacobs field personnel inspected the monitoring well caps, cover bolts, casing, and plugs during 2020 groundwater monitoring activities at sampled monitoring wells. All sampled monitoring wells were in good condition with no apparent frost jacking.

2.4 WELL SURVEY AND GROUNDWATER GRADIENT EVALUATION

Jacobs contracted Lounsbury & Associates, Inc. to perform surveys of the locations and elevations of sampled monitoring wells at the MAW site. Monitoring well surveys were conducted using a Leica GS16 Real Time Kinematic global navigation satellite system. Wells surveyed referenced the existing control network at FAI, using Real Time Kinematic global navigation satellite system survey methods with redundant measurement techniques to record the location and elevation of the monitoring wells. All monitoring wells were surveyed vertically and horizontally. Survey data has a horizontal accuracy of 1.0 foot and a vertical accuracy of 0.01-foot. Lounsbury & Associates, Inc. was responsible for providing coordinates and elevation data corresponding to each well to Jacobs. Jacobs used the data for both mapping and groundwater elevation assessment purposes. Survey-grade geospatial data will be reported in the North American Datum of 1983, National Adjustment of 2011 (epoch 2010.00) for horizontal measurements, and the North American Vertical Datum of 1988 (NAVD88) (GEOID12B-derived) for vertical measurements.

2.5 INVESTIGATION-DERIVED WASTE

Nonhazardous investigation-derived waste was generated during the field events. Disposable personal protective equipment and sampling materials (e.g., disposable tubing) were bagged and disposed of at Fairbanks North Star Borough landfill. Nonhazardous investigation-derived waste also included purge and decontamination water, generated during monitoring well purging and decontamination of reusable equipment (e.g., water level meter, YSI water quality meter, and turbidity meter) in accordance with JE-SOP-2000 *Decontamination* (Appendix H). Purge and decontamination water (approximately 19.5 gallons) were containerized in 5-gallon buckets during sampling, then transferred to a designated 55-gallon drum and stored at the FAI waste storage facility (almost directly across Old Airport Road from MAW) prior to transport and disposal by an FAI-contracted waste disposal firm at a later date.

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3.0 PROPOSED CLEANUP LEVELS

Analytical sample results were screened against 2020 GCLs specified in Table C of 18 AAC 75 (ADEC 2020). The following table (Table 3-1) identifies laboratory analytical method used, GCLs, and limits of detection (LODs) utilized in the MAW groundwater monitoring event for select analytes commonly encountered at fuel-contaminated sites (i.e. GRO, DRO, RRO, and BTEX). Laboratory methods, GCLs, and LODs of all other VOCs can be found in the full analytical data tables provided in Appendix E.

Table 3-1
GCLs for Select Target Analytes at MarkAir Warehouse Site

Analyte	Method	2019 ADEC GCL[1] (µg/L)	LOD[2] (µg/L)
GRO	AK101	2,200	2,500[3]
DRO	AK102	1,500	334
RRO	AK103	1,100	278
Benzene	SW8021B or SW8260D	4.6	0.25
Toluene	SW8021B or SW8260D	1,100	0.5
Ethylbenzene	SW8021B or SW8260D	15	0.5
Total Xylenes	SW8021B or SW8260D	190	1.5

Notes:
[1] 18 AAC 75. Table C Groundwater Human Health Cleanup Levels (ADEC 2020b).
[2] LOD is the highest observed for all samples.
[3] Results associated with high LODs were much greater than the GCL.
For definitions, refer to the Acronyms and Abbreviations section.

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4.0 QUALITY ASSURANCE ASSESSMENT

This section details the QC and sample preservation practices employed during groundwater sample collection to ensure data quality. Analytical data packets received by the laboratory (Attachment F-1) were reviewed for data quality and usability by Kari Hagen, the Jacobs project chemist. Findings of the data review are presented in Sections 4.2 and 4.3.

4.1 QUALITY CONTROL

Samples were collected using the sample containers provided by SGS. The sample containers came prepared with the appropriate laboratory- provided preservative, which included hydrochloric acid for GRO, DRO, RRO, BTEX, methane, and VOC samples, sulfuric acid for total nitrate/nitrite and phosphorous samples, and nitric acid for manganese and iron samples. Sample containers were labeled with the sample ID number, date and time of collection, sampler initials, and analyses requested. Each sample's temperature was maintained between 0 and 6 degrees Celsius (ºC) while in storage and during shipment. The samples were submitted to the SGS office in Fairbanks, Alaska for shipment to their laboratory in Anchorage, Alaska for analytical testing. For QC, one field duplicate was collected during the sampling event and submitted for all requested analyses. Each cooler that contained volatile sample bottles contained a trip blank. Trip blanks accompanied the sample containers from the laboratory to the MAW site and back to the laboratory for analysis. The trip blanks were analyzed for GRO, BTEX, VOCs, and EDB.

4.2 DATA QUALITY

Jacobs performed this data quality review and completed the ADEC Laboratory Data Review Checklists (Attachment F-1) for records associated with the analytical data. The Jacobs project chemist performed a completeness check to verify that data packages included all the requested information. All analytical data were reviewed, including the chain-of-custody and sample receipt records, laboratory case narratives, and laboratory data. Analytical data were reviewed for methodology, sample holding times, laboratory blanks, limits of quantitation (LOQs), LODs, detection limits (DLs), laboratory control sample recoveries, and precision. Other QC

parameters (initial calibration, continuing calibration, tuning, internal standards, interference check solutions, post-digestion spikes, and serial dilutions) were reviewed by means of the laboratory case narrative. The following qualifiers were applied during the review:

E The result was nondetect (ND) and the LOD exceeds the GCL.

B The analyte was detected in the method blank, trip blank, or equipment blank and the concentration in the sample did not exceed the blank concentration by a factor of 5.

J The result is an estimated value because it was greater than the DL but less than the LOQ.

JL The result was an estimated value biased high (+) or low (-) because the analyte failed recovery criteria in the laboratory control sample, laboratory control sample duplicate, or both.

Project specific matrix spike/matrix spike duplicates (MS/MSDs) were not required for this project; however, they were included in the analytical batches as the methods required. MS/MSDs were only evaluated if they were performed on samples from this project.

4.3 DATA USABILITY

The overall quality of project data was acceptable. The qualifications applied during data validation did not adversely affect data usability.

All reported data are considered usable with limitations discussed in this report and in the ADEC Laboratory Data Review Checklists (Attachment F-1). The following QC issues were identified during the review:

- Several ND results had LODs greater than the GCLs and were qualified E. Results exceeding the GCL may be reported as ND. Except EDB, affected results were not contaminants of concern at this site. EDB was analyzed by Method SW8260D SIM and the LOD met the GCL. The following analytes had LODs greater than the GCL in one or more ND samples:
  - **SW8260D:** 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,2,3-trichloropropane, 1,2,4-trichlorobenzene, 1,2-EDC, 2-hexanone, bromodichloromethane, bromomethane, carbon tetrachloride, chloroform, EDB, hexachlorobutadiene, 1,1,2-trichloroethene, trans-1,3-dichloropropene and vinyl chloride.
- Nitrate/Nitrite-N was detected in the method blank. Associated sample results with detections less than 5 times the blank concentration were qualified B to indicate the sample result may be biased high.

- DRO, RRO, and phenanthrene (SW8270 SIM) were detected in the equipment blank, 20MAW/BFS-EB. Associated results with detections were qualified B to indicate the result may be biased high. Samples 20MAW-MW10-GW, 20MAW-MW10-GWA for RRO were slightly greater than the screening level and may be biased high. All other B qualified results were less than the GCLs; therefore, the data quality and usability were minimally affected.

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5.0 RESULTS AND FINDINGS

This section presents analytical groundwater results and a comparison to historical data and the results of the Mann-Kendall analysis of groundwater contaminant concentration data.

5.1 MONITORING WELL GAUGING

Depth to groundwater at sampled groundwater wells ranged from approximately 9.52 to 11.25 feet bgs. This equated to an elevation of 421.58 feet at the shallowest and most southeastern well (MW-5), and an elevation of 421.24 feet at the three deepest and most northwestern wells (MW-9, MW-12, and MW-8), confirming that groundwater flow direction is generally from east to west, slightly northwest. No free product was detected in any of the seven monitoring wells. A summary of well integrity and gauging data is presented in Table 5-1.

Table 5-1
Summary of Well Integrity and Gauging Data

Well ID	Integrity	Depth to Product (feet bgs)	Depth to Groundwater (feet btoc)	Groundwater Elevation (feet)	Total Well Depth (feet btoc)
MW-3	Good	No product	10.02	421.31	19.28
MW-5	Good	No product	9.51	421.58	17.00
MW-8	Good	No product	10.58	421.24	18.75
MW-9	Good	No product	9.93	421.24	16.58
MW-10	Good	No product	11.25	421.35	16.70
MW-12	Good	No product	9.51	421.24	17.72
MW-17	Good	No product	11.16	421.34	14.45

Note:
For definitions, refer to the Acronyms and Abbreviations section.

Historical well gauging data for those monitoring wells sampled and gauged during the 2020 monitoring event is found in Table E-1 (Appendix E). Historic gradient information from this site, and from the results of the 2020 groundwater survey, shows a consistent groundwater flow gradient of 0.001 to the northwest (Figure A-2).

5.2 RESULTS

The following paragraphs summarize the results of the 2020 groundwater monitoring event, including water quality parameters, analytical results of the 2020 samples, and provide a brief comparison of 2020 results to historical data. A more thorough analysis of contaminant concentration trends in each monitoring well is provided in Section 5.3, Mann-Kendall Time-Series Analysis, and locations of 2020 exceedances are presented on Figure A-2.

5.2.1 Water Quality Parameters

Table 5-2 shows the final water quality parameters measured during monitoring well purging. Groundwater reached stability in all sampled wells prior to sampling. Purged water volume and groundwater parameters were recorded in groundwater sampling forms (Appendix D).

Table 5-2
2020 Final Water Quality Parameters

Well ID	Temperature (ºC)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	Turbidity (NTU)
MW-3	5.93	766	13.42	6.63	-26.2	7.50
MW-5	4.02	433	6.98	6.78	77.3	4.42
MW-8	5.30	548	2.05	6.71	-27.3	5.71
MW-9	5.25	523	7.60	6.75	73.0	5.41
MW-10	3.93	643	41.28	6.69	-56.4	7.93
MW-12	5.00	460	17.35	6.56	53.40	48.38
MW-17	4.37	1260	1.52	6.64	35.0	12.57

Note:
For definitions, refer to the Acronyms and Abbreviations section.

5.2.2 Analytical Results for Site Contaminants

Analytical results are presented by analyte or analyte group. Historical and 2020 results corresponding to monitoring wells sampled in 2020 are presented in Tables E-2 through E-5 (Appendix E). Fuels (GRO, DRO, and RRO) and BTEX are presented in Table E-2 and all other VOC results are presented in Table E-3. PAH and MNA parameter results are presented in Tables E-4 and E-5, respectively.

GRO

The concentrations of GRO in MW-8 (2,390 [micrograms per liter] µg/L) and in the primary and field duplicate samples collected at MW-10 (28,400 and 29,000 µg/L, respectively) exceeded the GCL (2,200 µg/L). Results were below the GCL in the remaining wells (Table E-2).

Historically, GRO concentrations exceeded the GCL at monitoring well MW-8 during almost all prior sampling events. Concentrations ranged from a maximum detected concentration (MDC) of 20,900 µg/L in 2004 to a minimum of 2,290 µg/L in 2008. Concentrations have generally been decreasing from 2012 (8,720 µg/L) to 2020 (2,390 µg/L).

GRO results at MW-10 exceeded the GCL from 2008 through 2020, except for results from July of 2012. The MDC for GRO at MW-10 was 42,900 µg/L in 2008. Three other historical results (two in 2012 and one in 2018) were detected at concentrations over 30,000 µg/L.

DRO

DRO concentrations during the 2020 groundwater monitoring event exceeded the GCL (1,500 µg/L) in monitoring wells MW-10 and MW-17. DRO was detected at 14,800 µg/L and 14,400 µg/L, respectively, in primary and field duplicate samples collected from MW-10. The DRO concentration at MW-17 was 3,050 µg/L (Table E-2).

Historically, DRO concentrations exceeded the GCL at MW-10 in all previous sampling events, except one in 2010 and one in July 2012. The MDC for DRO at MW-10 occurred in 2020. At MW-17, DRO concentrations exceeded the GCL in samples collected during all monitoring events, with the MDC (5,200 µg/L) occurring in November 2012.

RRO

RRO concentrations in 2020 exceeded the GCL (1,100 µg/L) in MW-10 and MW-17, at maximum concentrations of 1,300 µg/L and 3,620 µg/L, respectively. Results were below the GCL in the remaining wells (Table E-2).

Historically, RRO concentrations exceeded the GCL at monitoring well MW-10 in November 2012 and at MW-17 during the October and November 2012 sampling events. At MW-10 the MDC was 4,480 µg/L in November 2012. At MW-17, concentrations were 1,650 and 1,290 µg/L in October and November 2021, respectively, and the MDC was in 2020.

Benzene

The concentration of benzene in MW-8 (393 µg/L), and in the primary and field duplicate samples collected at MW-10 (809 and 824 µg/L, respectively) exceeded the GCL (4.6 µg/L). Results of benzene concentrations in all other monitoring wells were less than the GCL (Table E-2).

Benzene concentrations have historically exceeded the GCL in monitoring wells MW-8, MW-9, MW-10, and MW-12. At MW-8, concentrations have exceeded in every prior sampling event, with the MDC occurring in the field duplicate sample collected in 2016, measuring 4,490 µg/L; however, this result was qualified J due to a relative percent difference failure between the primary and field duplicate sample. The next greatest concentration of benzene at MW-8 occurred in 2004 and measured 3,860 µg/L. At MW-10, the MDC occurred in 2004 and measured 3,450 µg/L. The only benzene exceedance at MW-9 was detected in September 2012 and measured 6.71 µg/L. Benzene concentrations at MW-12 exceeded the GCL in most of the previous sampling events, with the most recent exceedance occurring in 2013 and measuring 30.5 µg/L.

Toluene

The concentration of toluene exceeded the GCL (1,100 µg/L) in monitoring well MW-10 in 2020. Concentrations in the primary and field duplicate samples from MW-10 measured 4,940 µg/L and 4,960 µg/L. respectively. Toluene concentrations in all other monitoring wells sampled in 2020 were less than the GCL (Table E-2).

Historically, toluene concentrations have consistently exceeded the GCL in MW-10, except during the September 2010 and July 2012 sampling events. No historical exceedances for toluene have been detected at other MAW monitoring wells (Table E-2).

Ethylbenzene

The concentrations of ethylbenzene exceeded the GCL (15 µg/L) at MW-8 and MW-10 in 2020. The concentration was 196 µg/L in MW-8 and the MDC of the primary and field duplicate sample pair collected at MW-10 was 947 µg/L. The concentrations of ethylbenzene in all other monitoring wells sampled in 2020 were less than the GCL (Table E-2).

Historically, ethylbenzene concentrations in MW-8 and MW-10 have exceeded the GCL. Ethylbenzene concentrations in MW-8 exceeded the GCLs in every sampling event from 2004 to 2020, with the MDC occurring in 2004 and measuring 1,410 µg/L, and the minimum concentration occurring in July 2012 and measuring 39.2 µg/L. In MW-10, ethylbenzene concentrations exceeded the GCL in all sampling events conducted from 2004 through 2020. The MDC of 1,710 µg/L was detected in 2004 and the minimum concentration of 63 µg/L was detected in July of 2012.

Total Xylenes

The concentrations of total xylenes exceeded the GCL (190 µg/L) in monitoring wells MW-8 and MW-10 in 2020. The concentration measured 370 µg/L in MW-8 and the MDC of the primary and field duplicate sample pair collected at MW-10 measured 8,200 µg/L. Concentrations of total xylenes in all other monitoring wells sampled during the 2020 were less than the GCL (Table E-2).

Historically, concentrations of total xylenes have exceeded the GCL in MW-8 in all monitoring events, except in July 2012. Similarly, in MW-10, concentrations of total xylenes exceeded the GCL in all monitoring events, with the MDC of 9,860 µg/L occurring in 2008, and the minimum concentration of 337 µg/L occurring in July 2012.

Other VOCs

Samples from 2020 with detected concentrations of VOCs, aside from BTEX, are listed in Table E-3 (Appendix E) compared to historical groundwater analytical results. The EDB concentration at MW-10 exceeded the GCL (0.075 µg/L) in 2020; the MDC between the primary and duplicate sample pair was 3.89 µg/L.

The EDC concentration at MW-8 exceeded the GCL (1.7 µg/L) at MW-8, at 3.04 µg/L. EDC was ND in the groundwater sample collected from MW-10.

Concentrations of 1,2,4-TMB and 1,3,5-TMB exceeded the GCLs (56 µg/L and 60 µg/L, respectively) in groundwater samples collected from MW-10, and the concentration of 1,2,4-TMB exceeded the GCL in the sample collected from MW-8 in 2020. The MDCs between the primary and field duplicate sample from MW-10 for 1,2,4-TMB and 1,3,5-TMB were 1,650 µg/L and 426 µg/L, respectively. The concentration of 1,2,4-TMB at MW-8 was 153 µg/L.

Naphthalene concentrations exceeded GCL (1.7 µg/L) in groundwater samples collected from MW-8 and MW-10 in 2020. The concentration at MW-8 was 72.3 µg/L, and the MDC of the primary and field duplicate sample collected at MW-10 was 463 µg/L (Table E-3).

No other VOCs were detected at concentrations exceeding their respective GCLs in monitoring wells sampled for VOCs.

Historically, EDB concentrations at MW-8 exceeded the GCL in 2004 (0.543 µg/L) and 2016 (0.2 µg/L). EDC concentrations also exceeded the GCL at MW-10 in all prior monitoring events, with the MDC in 2008 (79.3 µg/L with a J qualifier), and the minimum concentration of 0.183 µg/L in 2012.

The EDC concentration at MW-8 have consistently exceeded the GCL except for a ND result in 2005. The MDC concentration of EDC in MW-8 was 32.4 µg/L (2004) and the minimum concentration was 2.35 µg/L in 2018. Historically, MW-12 had one EDC GCL exceedance that occurred in 2008 at 1.7 µg/L.

Historically, concentrations of 1,3,5-TMB exceeded the GCLs in groundwater samples collected from MW-8 and MW-10 in every prior sampling event except for one. 1,2,4-TMB concentrations in MW-8 exceeded the GCLs in every sampling event from 2004 to 2020, with the MDC occurring in 2004 and measuring 916 µg/L, and the minimum concentration occurring in 2008 and measuring 75.4 µg/L. In MW-10, 1,2,4-TMB concentrations exceeded the GCL in

all sampling events except for a minimum concentration measured in 2010 at 3.23 µg/L. The 1,3,5-TMB MDC at MW-10 (1,790 µg/L) was detected in 2008.

Historically, 1,3,5-TMB concentrations in MW-8 exceeded the GCLs in about half of the sampling events from 2004 to 2020, with the MDC occurring in 2004 and measuring 229 µg/L, and the minimum concentration occurring in 2013 and measuring 15.6 µg/L. In MW-10, 1,3,5-TMB concentrations exceeded the GCL in about half of the sampling events with a minimum concentration measured in 2010 at 9.86 µg/L and an MDC of 535 µg/L in 2008.

Historical naphthalene concentrations consistently exceeded GCL in groundwater samples collected from MW-8 and MW-10 during the sampling events of 2004 to 2020. Naphthalene concentrations in MW-8 exceeded the GCL with an MDC occurring in 2004 and measuring 318 µg/L, and the minimum concentration occurring in 2008 and measuring 29.9 µg/L. In MW-10, naphthalene concentrations exceeded the GCL in all sampling events with an MDC occurring in 2008 and measuring 568 µg/L, and the minimum concentration occurring in 2010 and measuring 2.51 µg/L. Naphthalene was detected above the GCL in the groundwater sample from MW-12 in only its first year (2008) at a concentration of 8.04 µg/L.

PAHs

PAH compounds were detected in both MW-8 and MW-10 in 2020. Three PAH compounds (1-methylnaphthalene, 2-methylnaphthalene, and naphthalene) were detected above the GCL in MW-10, and one (naphthalene) in MW-8 (Table E-4).

The concentration of 1-methylnaphthalene exceeded the GCL (11 µg/L), with the MDC from the primary and field duplicate sample pair measured at 118 µg/L. The concentration of 2-methylnaphthalene also exceeded the GCL (36 µg/L) in MW-10, with the MDC between the primary and field duplicate measuring 165 µg/L. Naphthalene concentrations exceeded the GCL (1.7 µg/L) in the groundwater samples collected from MW-8 and MW-10. Naphthalene was sampled using both EPA Method SW8270SIM and SW8260D in 2020. The MDC in 2020 for both monitoring wells was detected using EPA Method SW8260D; as previously

mentioned, under "Other VOCs," the concentrations of naphthalene at MW-8 and MW-10 were 72.3 µg/L and 454 µg/L, respectively.

Historically, concentrations of 1-methylnaphthalene and 2-methylnaphthalene exceeded the GCL in MW-10 during the 2018 sampling event at 86.9 and 115 µg/L, respectively. In 2018, naphthalene also exceeded the GCL in MW-8 at 49.6 µg/L. Similarly, in MW-10, concentrations of naphthalene exceeded the GCL in 2018, at 230 µg/L.

5.2.3 Evaluation of MNA Parameters

Nitrate/nitrite, total phosphorous, sulfate, and iron and manganese analyses were performed on groundwater samples collected from MW-5, MW-8, MW-10, and MW-12 as part of MNA (Table 5-3). Results at MW-5 represent conditions upgradient of the groundwater contamination plume, results at MW-10 represent in-plume conditions, and results at MW-5 and MW-12 represent downgradient conditions. The results can be used to determine if natural attenuation is occurring at the site.

Table 5-3
2020 Groundwater Parameters (µg/L)

Well ID	Methane	Sulfate	Total Nitrate/ Nitrite-N	Total Phosphorus	Iron	Manganese
MW-5	77.2 [0.25]	11,000 [100]	1390 [100]	ND [20]	996 [250]	385 [1]
MW-8	312 [0.25]	6,920 [500]	92.4 [100] J,B	130 [20]	36,800 [500]	**3,910 [2]**
MW-10	1,820 [2.5]	517 [100]	192 [100] J,B	875 [100]	123,000 [1250]	**5,450 [5]**
MW-10*	2,390 [2.5]	471 [100]	192 [100] J,B	926 [40]	125,000 [1250]	**5,600 [5]**
MW-12	568 [0.25]	8,930 [100]	55 [100] J,B	139 [20]	24,800 [500]	**2,990 [2]**

Notes:
* Sample is a field duplicate of the preceding sample with the same name.
Bold results exceed ADEC GCL (18 AAC 75, Table C) (ADEC 2020b).
[ ] = LOD
B = The analyte was detected in the method blank, trip blank, or equipment blank and the concentration in the sample did not exceed the blank concentration by a factor of 5.
J = The result is an estimated value because it was greater than the detection level but less than the limit of quantitation.
For definitions, refer to the Acronyms and Abbreviations section.

The subsections that follow evaluate results of the MNA parameters analyzed during the 2020 sampling event and water quality measurements obtained during sampling to determine if conditions at the site are conducive to degradation of site contaminants.

Dissolved Oxygen

DO serves as and is the favored electron acceptor during the biodegradation process for petroleum hydrocarbons. At concentrations greater than 0.5 mg/L, the reductive pathway may be suppressed (EPA 1998).

The average DO concentration at MAW site wells in 2020 was 12.88 mg/L. The DO concentration was greatest at the most contaminated well (MW-10) at 41.28 mg/L (Table 5-2). The high availability of DO suggests that electron acceptors are available to support biodegradation, but that at present, aerobic biodegradation may not be readily occurring.

Nitrate/Nitrite

Once DO is depleted in the contaminant plume, anaerobic degradation continues with nitrate serving as the favored electron acceptor during hydrocarbon degradation. In 2018, a nutrient solution was injected in wells IW-1, IW-2, IW-3, and IW-4, located at former UST locations upgradient of MW-10 and MW-17. The nutrient injection was performed with the intent to provide nitrogen to microbial communities in the form of nitrate/nitrite to promote hydrocarbon degradation. The target concentration was 240,000 µg/L.

The concentrations of total nitrate/nitrite in 2020 measured at 192 µg/L at MW-10, located within the plume. The highest concentration (1,390 µg/L) was detected upgradient of the contaminant plume at MW-5. Downgradient of the plume, at MW-8 and MW-12, nitrate/nitrate measured 92.3 µg/L and 55.0 µg/L, respectively. The low concentrations of nitrate/nitrite within and downgradient of the contaminant plume, where concentrations would have measured closer to the target concentration of 240,000 µg/L in 2018, indicate that nitrate reduction has occurred at the site. However, the low concentrations observed in 2020 indicate that at present, nitrate reduction is not a leading anaerobic biodegradation process.

Manganese

Manganese is made available when it is chelated from subsurface soil and serves as an electron acceptor for anaerobic digestion of BTEX by microbes. The presence of high concentrations of soluble manganese in groundwater can indicate that anaerobic biodegradation is occurring.

Manganese concentrations in the upgradient well, MW-5, measured 385 µg/L. At MW-10, nearest the contaminant source, the manganese concentration was 5,600 µg/L. Downgradient of the contaminant plume, at MW-8 and MW-12, concentrations measured 3,910 µg/L and 2,999 µg/L, respectively. The manganese results indicate reduced conditions within the contaminant plume, supporting the idea that anaerobic biodegradation is occurring.

Iron

Ferrous iron in groundwater at fuel-contaminated sites often appears in high concentrations when ferric iron chelated from soil is reduced to the soluble ferrous form.

Sitewide, ferrous iron concentrations ranged from 996 µg/L at MW-8 (downgradient of the plume) to 123,000 µg/L at MW-10 (the most contaminated well within the plume). The results for dissolved iron indicate reduced conditions within the plume and that anaerobic biodegradation is occurring through chelation of ferric iron followed by reduction of ferric iron to ferrous iron, with the most significant activity occurring within the most contaminated area of the plume.

Sulfate

Sulfate-reducing bacteria use sulfate for anaerobic biodegradation of BTEX once nitrate and DO in groundwater have been fully consumed. Significant concentrations of sulfate indicate that a healthy source for microbial digestion of fuel contamination.

The greatest sulfate concentration (11,000 µg/L) was detected at MW-5, located upgradient of the contamination. Within the contaminant plume, at MW-10, the sulfate concentration was 517 µg/L, and downgradient at wells MW-8 and MW-12, concentrations were 6,920 µg/L and 8,930 µg/L, respectively. Results indicate the presence of sulfate to support the sulfate-reducing

bacteria community and continue the digestion of BTEX. Moreover, the lower concentrations observed at MW-10 suggest that sulfate-reducing bacteria are actively digesting contamination within the plume.

Total Phosphorous

The addition of phosphorus at fuel-contaminated sites can stimulate microbial degradation of petroleum hydrocarbons. In 2018, the nutrient solution injection contained phosphorus and targeted a concentration of 60,000 µg/L.

Phosphorus concentrations in 2020 were greatest at MW-10 within the contaminant plume at 926 µg/L, and lowest upgradient of the contaminant plume at MW-5, where concentrations were nondetect. Downgradient of the plume, concentrations were 130 µg/L and 139 µg/L at MW-8 and MW-12, respectively. The 2020 results indicate that the nutrient injections are successfully introducing phosphorus to the subsurface in the most contaminated area of the site (MW-10) and downgradient to stimulate hydrocarbon digestion. Assuming that the concentration were closer to the target of 60,000 ug/L after injecting the solution in 2018, the 2020 results also indicate that the microbial community has used phosphorus for anaerobic degradation since the last injection.

Methane

Methane is not used by hydrocarbon-degrading bacteria but is an indicator of anaerobic biodegradation of hydrocarbons using carbon dioxide in groundwater as a terminal electron acceptor.

Concentrations of methane upgradient of the contamination plume measured 77.20 µg/L at MW-5. Within the plume, at MW-10, the concentration of methane was 2,390 µg/L. Downgradient, at MW-8 and MW-12, concentrations of methane were 312 µg/L and 568 µg/L, respectively. The methane results suggest that anaerobic biodegradation is occurring at the site, with the greatest activity occurring in the heaviest area of contamination.

ORP, Temperature, and pH

ORP across the site ranged from -56.4 millivolts (mV) at MW-10 (within the plume) to 77.3 mV at MW-9 (downgradient of the plume). Measurements below 50 mV indicate potential reducing site conditions, whereas measurements less than -100 mV indicate a likely reductive pathway (EPA 1998). Measurements were less than 50 mV at all wells except at MW-9 (downgradient of the plume) and at MW-5 (upgradient of the plume), indicating a possible reductive pathway.

Groundwater temperature at the site ranged between 4.02ºC and 5.93ºC during sampling. These temperatures are well below the optimal temperature for accelerated biodegradation processes (i.e., 20ºC) (EPA 1998). The measured temperatures would be prohibitive of any anaerobic processes occurring at the site.

Measured pH across the site was relatively consistent, ranging from 6.56 to 6.73. The observed pH is within the optimal range to support a reductive pathway (between 5 and 9) (EPA 1998).

5.2.4 Genetic Results

Samples from four wells (MW-5, MW-8, MW-10, and MW-12) were sent to Microbial Insights for analysis by their QuantArray-Petro method. This method quantifies a broad spectrum of different microorganisms and key functional genes involved in a variety of pathways for hydrocarbon degradation. A summary of the microorganisms present in the wells and their numbers is found in Table F.2-1. The full report by Microbial Insights is included in Attachment F-2, with figures that show target gene concentrations in each well analyzed relative to each other, as well as relative to observed values in the larger database of analyzed wells (outside this study). Comparisons of these results with historical results for benzyl succinate synthase (BSS) and sulfate-reducing bacteria (adenosite-5'-phosphosulfate reductase [APS]) show similarities to recent population concentrations since coeval remedial injection and monitoring began in 2012 (Table 5-4).

Table 5-4
2020 and Historical Groundwater – Microbial Analysis Genetic Results

Well ID	Sample Date	BSS (cells/mL)	APS (cells/mL)
MW-5	9/5/2013	141 (H)	240 (H)
	11/7/2013	125	1.3 (J)
	10/12/2016	9	468,000
	12/16/2020	*82*	*3,490*
MW-8	7/25/2012	3	682
	9/18/2012	7	989
	10/17/2012	ND [1]	1,080
	11/15/2012	119	1,990
	9/5/2013	4,360 (H)	1,180 (H)
	11/7/2013	7,230	1,080
	10/12/2016	18,400	443,000
	12/15/2020	*6,400*	*52,900*
MW-10	9/5/2013	11,300 (H)	41,400 (H)
	11/7/2013	1,050	12,500
	10/12/2016	17,400	72,600
	12/15/2020	*11,700*	*40,900*
MW-12	9/5/2013	117 (H)	3,690 (H)
	11/7/2013	203	686
	10/12/2016	421	762,000
	12/16/2020	*380*	*45,400*

Notes:
Italic = results are from this 2020 study and historical data from 2018 groundwater monitoring report (DOT&PF 2018).
H = Sample hold time exceeded prior to analysis
J = Estimated gene copies below detection limit but above limit of quantitation
For definitions, refer to the Acronyms and Abbreviations section.

The report (Attachment F-2) includes additional summary tables grouped by biodegradation pathways and contaminant type to show which microbes present in the MAW wells have shown biodegradation abilities for the noted contaminants via specific gene pathways. The following paragraphs describe the five common pathways that have been most studied for degradation of hydrocarbons in groundwater wells, and the relative population concentrations of microbes and genes present in the wells from this study.

Aerobic BTEX and Methyl-t-Butyl Ether

The microorganism and gene results show that wells MW-8, MW-10, and MW-12 have target microbial gene populations involved in aerobic biodegradation of BTEX and methyl-t-butyl ether, with the largest cell concentrations recorded in cells per milliliter (cells/mL) at monitoring well MW-10, followed by MW-8, and MW-12. Populations in these wells were

greatest for toluene 2 monooxygenase/phenol hydroxylase, toluene ring hydroxylating monooxygenase, and phenol hydroxylase (Table E-5).

Aerobic PAHs and Alkanes

Population concentrations for the aerobic biodegradation pathway of PAHs and alkanes were found only in MW-8. These populations included naphthalene dioxygenase and naphthalene-inducible dioxygenase.

Anaerobic BTEX

Anerobic BTEX degrading microbes were detected in the highest concentrations in wells MW-10 and MW-8, specifically as BSS and benzoyl coenzyme A reductase. These two microbial gene concentrations for anerobic BTEX degradation were present in all analyzed wells.

Anaerobic PAHs and Alkanes

Population concentrations for the anerobic biodegradation pathway of PAHs and alkanes were found in the highest concentrations in MW-8, with naphthyl methyl succinate synthase at the highest observed concentrations, followed by fewer alkyl succinate synthase. MW-10 and MW-12 contained populations of these compounds in lower concentrations.

Other (Bacteria)

Other bacteria responsible for biodegradation were detected in high numbers in all four wells. Total eubacteria and sulfate-reducing bacteria (APS) showed the largest population concentrations in any degradation pathway category.

5.3 MANN-KENDALL ANALYSIS

The Mann-Kendall test does not make any assumptions about the statistical distribution of the data or regularity of sampling intervals; therefore, it is a general-purpose tool used to identify whether a trend is present and whether the slope of the trend is positive, zero, or negative. If the Mann-Kendall test suggests a declining trend, then geometric regression of the data is used to evaluate the rate of natural attenuation, the probable start of the attainment phase of monitoring, and the probable date of complete remediation. A Microsoft Excel workbook was programmed to perform the regression analysis (Appendix G). The geometric regression methodology is

consistent with EPA guidance for evaluating completion of groundwater cleanup (EPA 2014). The EPA guidance defines the attainment phase as the period of monitoring during which contaminant concentrations are expected to have decreased to less than the project cleanup levels.

The calculated Mann-Kendall statistic is proportional to the strength of the trend, with negative values representing decreasing trends, values close to zero representing stable trends, and positive values representing increasing trends. The test also calculates a coefficient of variation, which reflects the variability of the data; values greater than or equal to one indicate excessive scatter. Finally, the test provides a trend confidence, which is the probability that the trend identified by the test statistic is real rather than arising by chance. Detailed results of the Mann-Kendall trend analysis for each contaminant in each well are presented in Table 5-5, and the time-series plots for each contaminant are presented with the full data tables in Appendix G.

Table 5-5
Mann-Kendall Trend Summary

Well	Analyte[1]	GCL[2] (µg/L)	UCL95* (µg/L)	Mann-Kendall Analysis				
				n	S	COV	1-alpha	Trend
MW-3	GRO	2,200	62.2	6	-7	0.31	0.86	Stable
	DRO	1,500	570	7	-13	0.46	0.97	**Decreasing**
MW-5	GRO	2,200	62.1	5	-4	0.33	0.76	Stable
	DRO	1,500	463	5	-2	0.50	0.59	Stable
MW-8	GRO	2,200	7,330	12	-15	0.85	0.83	Stable
	DRO	1,500	1,610	12	2	0.41	0.53	Stable
	Benzene	4.6	2,200	12	-18	0.98	0.88	Stable
	Ethylbenzene	15	481	12	-10	0.86	0.73	Stable
	Naphthalene	1.7	120	10	-10	0.80	0.78	Stable
	EDC	1.7	14.8	8	-2	1.32	0.55	No Trend
	1,2,4-TMB	56	561	8	-8	0.73	0.80	Stable
	1,3,5-TMB	60	153	8	-8	0.75	0.80	Stable
MW-9	DRO	1,500	487	10	-3	0.45	0.57	Stable
	Benzene	4.6	3.69	12	-16	0.89	0.85	Stable
MW-10	GRO	2,200	32,000	10	1	0.56	0.50	Stable
	DRO	1,500	9,390	10	25	0.68	0.99	**Increasing**
	Benzene	4.6	1,230	10	5	0.87	0.64	Stable
	EDB	0.075	13.8	12	3	1.64	0.55	No Trend
	Ethylbenzene	15	1,090	10	-1	0.56	0.50	Stable
	Toluene	1,100	5,880	10	5	0.77	0.64	Stable

Table 5-5 (Continued)
Mann-Kendall Trend Summary

Well	Analyte[1]	GCL[2] (µg/L)	UCL95* (µg/L)	Mann-Kendall Analysis				
				n	S	COV	1-alpha	Trend
	Xylenes	190	7,870	10	7	0.57	0.70	Stable
	Naphthalene	1.7	434	8	8	0.67	0.80	Stable
	1,2,4-TMB	56	1,760	6	3	0.75	0.64	Stable
	1,3,5-TMB	60	477	6	3	0.76	0.64	Stable
MW-12	GRO	2,200	348	10	-13	0.85	0.85	Stable
	DRO	1,500	676	10	-7	0.45	0.70	Stable
MW-17	DRO	1,500	4,730	8	-2	0.35	0.55	Stable
	RRO	1,100	2,140	7	8	0.84	0.85	Stable

Notes:
Red indicates unfavorable values (ULC95 exceeds GCL, Trend is increasing)
Green indicates favorable values (UCL95 less than GCL, Trend is decreasing)
[1] Analytes have at least one exceedance (except fuels), at least four results, and less than 50 percent ND results
[2] 18 AAC 75. Table C Groundwater Human Health Cleanup Levels (ADEC 2020b)
* 95 percent upper confidence level of the mean is calculated for the most recent eight results
n = number of results
S = Mann-Kendall sum of signs
COV = Mann-Kendall covariance; stable if less than 1, no trend if greater than 1 and 1-alpha less than 0.90
1-alpha = significance level; must be greater than 0.95 (95 percent) to conclusively identify a trend
For definitions, refer to the Acronyms and Abbreviations section.

Geometric (lognormal) regression plots for those wells statistically demonstrating a decreasing trend would normally be used to quantitatively analyze attenuation of groundwater contaminants at the MAW site. However, the only well and contaminant that showed a decrease was DRO in MW-3 and none of the available data showed an exceedance of the GCL at this location; therefore, a regression plot for this location would not be useful and is not presented. Results of the Mann-Kendall analysis for other contaminants at other wells were generally stable, except for EDC at MW-8 and EDB at MW-10, for which no trends were observed, and DRO at MW-10, which exhibited an increasing trend.

The exact cause for the overall increase in DRO concentrations at MW-10 is most likely related to biodegradation of DRO upgradient of the well that is migrating to the well. As residual DRO contamination from former leaking USTs and spills upgradient of MW-10 continues to weather to water-soluble polar byproducts (i.e., organic acids, alcohols, and phenols), which are detected as DRO via analytical method AK102, concentrations can reach levels above published solubilities (Alaska Statement of Cooperation Working Group [ASCWG] 2006). Published solubilities of DRO (1,000 to 5,000 µg/L) are below the concentrations observed between 2012

and 2020 (up to 14,800 µg/L), suggesting that these soluble DRO fractions must be present in the subsurface and driving the increasing concentrations. This idea is supported by the fact that no free product was observed in MW-10 in 2020 and concentrations were an order of magnitude greater than solubility.

Another possible contributor to increasing DRO concentrations at MW-10 could be overland flow or runoff from surface releases from vehicles, equipment, or materials parked or stored over or adjacent to the well. In 2020, a trailer was observed parked over MW-10 and a pallet of foam sealant with nearby surface staining was observed south of the well (Photograph No. 1, Appendix B). The surface surrounding MW-10 is paved and the pattern of the staining did not indicate flow toward the monitoring well or ponding of surface water at the well. Additionally, the rubber seal on the flushmount monitoring well appeared to be intact and functional. Although it is plausible that contaminants could have been introduced from the stained area, additional characterization of the stored foam sealant and sampling of the stained area would be necessary to determine if these are sources of DRO.

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6.0 CONCEPTUAL SITE MODEL

The CSM scoping and graphic forms were updated for the MAW site based on 2020 groundwater monitoring results (Appendix I).

Leaks and spills from historical USTs directly to subsurface soil remain the release mechanisms for fuel contamination at the site. Impacted media includes subsurface soil and groundwater. Complete exposure pathways include incidental soil ingestion, dermal absorption of contaminants from soil, inhalation of fugitive dust, dermal absorption of contaminants in groundwater, and inhalation of outdoor air by potential future commercial, industrial, and/or construction workers, site employees, site visitors, and/or trespassers. Inhalation of indoor air by current and future commercial, industrial, and/or construction workers, site employees, and site visitors or trespassers is also considered a complete pathway since contaminated soil remains in situ adjacent to the warehouse.

The site is currently paved with contamination present in groundwater and in soil at the groundwater interface (approximately 10 feet bgs). As a result, incidental soil ingestion, dermal absorption of contaminants from soil (i.e., naphthalene and 1-methylnaphthalene), inhalation of fugitive dust, and dermal absorption of contaminants in groundwater (i.e., naphthalene) would only become possible given future construction work at the site that disturbs pavement and exposes the subsurface. There are currently no plans for construction at the site. Exposure to volatile contamination via inhalation of outdoor air is possible but unlikely at present, given the depth to contamination in soil and groundwater. This exposure scenario becomes more likely in the case of future construction.

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7.0 CONCLUSIONS AND RECOMMENDATIONS

The following paragraphs present conclusions and recommendations for the MAW site based on historical analytical results, results of the 2020 monitoring event, and based on the Mann-Kendall analysis of historical data.

7.1 CONCLUSIONS

Results of the sampling event indicated the presence of the following contaminants at concentrations exceeding the ADEC GCLs in the specified monitoring wells:

- GRO, naphthalene, 1,2,4-TMB, EDB, benzene, ethylbenzene, and xylenes (total) in MW-8 and MW-10
- DRO in MW-10 and MW-17
- 1-Methylnaphthalene and 2-methylnaphthalene in MW-10
- Manganese in MW-8, MW-10, and MW-12.

Groundwater at monitoring well MW-10 remains the most contaminated based on number of contaminants detected and the magnitude of those contaminant concentrations. Geographically, the number contamination at the MAW site is greatest at MW-10, which is closest to the historical USTs, and at MW-8, downgradient from MW-10 (Figure A-2). Contaminant concentrations decrease with distance downgradient and away from the center of the site and the historical locations of these former USTs. However, the plume appears to be stable based on the time-series analyses and historical data.

Based on the 2020 Mann-Kendall analysis the following trends were concluded:

- MW-3: DRO was shown to be decreasing (although it has never been detected above GCL at this location).
- MW-10: DRO was shown to be increasing.
- All other analyzed wells and analytes displayed a stable trend or showed no trend at all.

The increasing DRO concentrations at MW-10 are most likely due to increased solubility of weathered biodegradation byproducts of residual DRO upgradient of the well, as evidenced by

the concentrations well above published solubility values for DRO and absence of free product (ASCWG 2006). However, surface spills and leaks could introduce contamination to MW-10 if a proper seal on the well is not maintained and if equipment and materials continue to be stored on and adjacent to the well.

Genetic analysis of four wells (MW-5, MW-8, MW-10, and MW-12) showed population concentration of microbes and gene pathways responsible for biodegradation are viable and seem to be consistent with past findings at this site. The genetic results likely show that the remedial injections for continued biodegradation of contaminants are helping keep the plume stable and may promote hydrocarbon degradation with future nutrient injections.

MNA parameter trends found in historical data support the benefit of continued nutrient injections (DOT&PF 2018). The results 2020 ORP measurements indicate a reducing environment within the contaminant plume area, and results for soluble manganese, ferrous iron, and sulfate suggest active anaerobic biodegradation of contaminants may be occurring. In addition, concentrations of phosphorus and nitrate/nitrite observed in 2020, when compared to the corresponding 2018 target concentrations from the nutrient solution injections, support that the microbial community may be using the nutrients for hydrocarbon degradation. After injections are concluded in Spring of 2022, MNA parameter trends can be more specifically addressed to note whether the nutrient solutions are continuing to enhance microbial activity as desired.

7.2 RECOMMENDATIONS

The following actions are recommended for the MAW site:

- Continue biennial sampling for GRO, DRO, RRO, VOCs, and PAHs and continue nutrient injection of the FAI MAW monitoring well network in coordination with the ADEC. Biennial injection and monitoring of groundwater should continue until the ADEC determines it is no longer necessary based on results of sampling activities. The delayed nutrient injection is rescheduled for Spring of 2022. After Spring 2022, groundwater monitoring, including sampling and nutrient injection should occur in Fall of 2022.

- For EDB, continue analyzing sample via EPA Method 8260D SIM to obtain LODs in ND samples that do not exceed the ADEC GCLs.
- Continue the frequency of injection for remediation. Results are mostly stable, showing no significant decrease in contaminant trends; therefore, the sufficiency of the frequency should be re-evaluated as more injections are completed and more data becomes available.
- Continue analyzing the trends in contaminant concentration data, and conduct geometric regression when trends are decreasing to predict the start of attainment and the year remediation goals will be met.
- Ensure that vehicles, equipment, and materials that could introduce contamination to groundwater are stored away from flushmount monitoring wells and in secondary containment as appropriate.
- Remove any staining from pavement adjacent to monitoring wells so that these are not a continued potential source of pollution. Be sure to properly containerize and dispose of washwater generated during stain removal.

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8.0 REFERENCES

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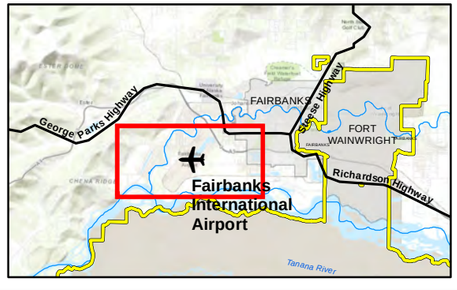
Appendix A
Site Figures



- Airport
- Project Location
- Existing Structure
- Ft. Wainwright Installation Boundary
- Water Feature

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Geospatial Features from Fairbanks North Star Borough GIS.

1 inch = 2,048.96 feet

0 0.5 1
Miles

N

WGS 1984 UTM Zone 6N Transverse Mercator

DOT&PF FAI MARKAIR WAREHOUSE GROUNDWATER MONITORING SITE LOCATION 2020 REPORT

FAIRBANKS INTERNATIONAL AIRPORT, FAIRBANKS, ALASKA

JACOBS	DATE: 19 FEB 2021	PROJECT MANAGER: G. WADE	FIGURE NO: A-1

P:\AKDOT\Fairbanks\MXD\Fig\A1_FAI_MarksAirWarehouse_SiteLocation.mxd robinsJ

Analyte	GCL* (ug/L)
GRO	2200
DRO	1500
RRO	1100
1-Methylnaphthalene	11
2-Methylnaphthalene	36
1,2-Dichloroethane	1.7
1,2,4-TMB	56
1,3,5-TMB	60
Benzene	4.6
EDB	0.075
Ethylbenzene	15
Naphthalene	1.7
Toluene	1100
Xylenes	190
EDB	0.075
Manganese	430

MW-4

MW-5

MW-17	
Analyte	Result (ug/L)
DRO	3,050
RRO	3,620

MW-11

MW-9

MW-17

IW-1

IW-2

IW-3

IW-4

AIRPORT LOT 07 BLOCK 10

MW-8

MW-10

MW-12

MW-12	
Analyte	Result (ug/L)
Manganese	2,990

MW-3

MW-13

MW-8	
Analyte	Result (ug/L)
GRO	2,390
1,2,4-TMB	153
1,2-Dichloroethane	3
Benzene	393
Ethylbenzene	196
Naphthalene	72
Xylenes	370
Manganese	3,910

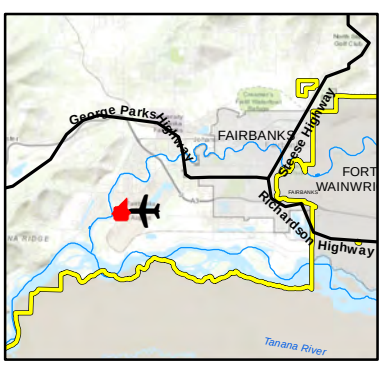
MW-14

MW-10**	
Analyte	Result (ug/L)
GRO	29,000
DRO	14,800
RRO	1,300
1-Methylnaphthalene	118
2-Methylnaphthalene	165
1,2,4-TMB	1,650
1,3,5-TMB	426
Benzene	824
EDB	4.51
Ethylbenzene	947
Naphthalene	463
Toluene	4,960
Xylenes	8,200
Manganese	5,600

MW-15

APPROX. GW FLOW DIRECTION
(WNW, Gradient = 0.001)

Notes:
Exceedances of GCLs at sampled monitoring wells are displayed.
*GCLs taken from 18 AAC 75 Table C Groundwater Human Health Cleanup Levels (ADEC 2020b)
Napthalene concentrations are the maximum detected using either SW8260 or SW8260SIM.
**Displayed results for MW-10 are maximum detected of the primary/field duplicate pair.
ug/L = micrograms per liter
GRO=Gasoline-range organics
DRO = Diesel-range organics
RRO = Residual-range organics
TMB = Trimethylbenzene
GCL = groundwater cleanup level
EDB = Ethylene dibromide



Monitoring Well
- No Exceedance
- Exceedance
- Not Sampled in 2020
- Parcel Boundary

- Injection Well
- MarkAir Warehouse
- Historical Excavation
- Former Underground Storage Tanks
- Fence

1 inch = 50 feet
0 25 50 75 100
Feet
WGS 1984 UTM Zone 6N Transverse Mercator

Imagery: ArcGIS Map Service
Server: https://gisportal.fnsb.us/image/services
Name: Imagery_2017_Pictometry_Fairbanks
(Accessed March 2021)
Geospatial Features from Fairbanks North Star Borough GIS.

DOT&PF FAI MARKAIR GROUNDWATER MONITORING
GCL EXCEEDANCES
2020 REPORT
FAIRBANKS INTERNATIONAL AIRPORT, FAIRBANKS, ALASKA

JACOBS	DATE: 09 MAR 2021	PROJECT MANAGER: G. WADE	FIGURE NO: A-2

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Appendix B
Photograph Log

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska

PHOTOGRAPH LOG
TABLE OF CONTENTS

Photo Number **Page**

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Photo No. 1 – 15 December 2020
Location of well MW-10 under a trailer at the MarkAir Warehouse site prior to sampling. Well is located in the disturbed snow area. View facing north.

Photo No. 2 – 15 December 2020
MW-10 located under a trailer at the MarkAir Warehouse site prior to sampling. View facing southwest.

Photo No. 3 – 16 December 2020
Well monitoring setup with a YSI, turbidity meter, and a bladder pump inside an ice fishing tent to prevent freezing of groundwater during sampling. View facing southeast.

Photo No. 4 – 16 December 2020
Project Manager G. Wade (Jacobs) records groundwater parameters inside the temporary ice fishing tent with a portable heater to keep equipment warm. View facing southwest.

Appendix C
Field Notes

ADOT FAI

ADOT-J87-700198-H004-0001

Rite in the Rain.

ALL-WEATHER

ENVIRONMENTAL

№ 550F

J. Robinson

G. Wade

T. Laiti

No.550F - Environmental - Yellow - 4.75" x 7.5"

TTT Environmental
Instruments and Supplies
(907) 770-9041
www.tttenviro.com

ISBN 978-1-932149-50-0

Location Mark Air / FAI DoT Date 12/14/20

Project / Client DoT FAI

Personnel: K. Sicard
Loumsbury & Assoc. Inc. David Ciampa

Weather: Windy, 14F, overcast

Objective: Find & survey 7 wells at Mark Air, open them and measure WL.

0815 Packed gear from office

0845 Arr. on site, got key from IAL

0910 Met D. Ciampa (Loumsbury) & started looking for wells after going through FOWRA (safety tailgate form)

~~0~~ 10:30 Located all wells opened all wells & meas. WL & TOC.

10:30 T. Laiti came by to provide extra socket set

WL: ~~MW12~~ (yes) Depth to water

well name	btoc	bgs	diff
MW-12	9.01'	~~10.08~~ 9.51'	0.5
MW-3	9.63'	10.08	0.45
MW-17	10.64	11.22	0.58
MW-9	9.73	9.95	0.22
MW-5	9.10	9.54	0.44
MW-10	10.95	11.30	0.35
11:45 MW-8	10.36	10.58	0.22

Location Mark Air / FAI DoT Date 12/14/20

Project / Client D.O.T / FAI

12:15 Left site to pick up glassware and prep gear.

D. Ciampa still on site to measure wells with total station.

1424 K. Sicard back on site to drop off drum for IDW

Checked in with D. Ciampa

1525 Left site - back to office.

Packed, wrote sit Rep organized kits.

1600 End of field day

12-14-20

K. Sicard

Rite in the Rain

Location Airport / Mark Air Date 12/15/20

Project / Client DOT, FAI

Personnel: K. Sicard, G. Wade

Weather: 0-10 F, wind 5-10 mph

objectives: Sample GW wells at Mark Air site, PPE: modified level D.

0730 arr. at office

Calibrated multi Rae & bump test

Calibrated turbidity meter

0827 YSI : serial : 15H102751

TI rental, 556 mPS

T = 21.66 °C

Cond. P/N 00653 18 Lot#: CC19505

Cond: 1.337 mS/cm Exp: 02/12/21

pH: 4.01 actual 3.95

P/N 00654-00 LOT CC620441

exp: 05/13/21

pH: 7.00 actual: 6.90

P/N 00654-04 Lot CC616864 exp 4/23/21

pH: 10.01 actual: 9.97

00654-08 Lot: CC56 2031 exp. 5/25/21

ORP: 240.5

Lot: 1422 exp 4/22

0858 Departed office & headed to site

Held safety tailgate

Location Mark Air Date 12/15/20

Project / Client DOT, FAI

Set up at well MW-8

1005 started purging

1036 reached stability, sampled MI

1043 sampled rest

1105 Kari Hagen picked up microbial sample to ship Fed Ex overnight

1115 Finished sampling, Decon'd, packed up IDW 2.5 gals into Drum MAW #1 (MW-8)

12-1300 Lunch, left site for 1 hour

1310 Set up at MW-3

1336 Purged, stabilized

1343-1849 Sampled (MW-3)

Decon'd, IDW 2.0 gals

Packed up (into MAW 1 Drum)

14:30 Set up under trailer, awkward.

MW-10 - purged, stabilized

15:36 collected DWA / MI took an hour & 1st one 0.6 L till clogged

2nd filter 0.2 L till clogged

(MW-10) + 3 gals IDW

Collected rest of sample + DUP

20MAW-MW10-GWA-Dup. IDW = 3.0

17:30 Packed up, decon'd. Back to office

18:45 Packed sample bottles. End of Day

— K. Sicard

Rite in the Rain

Location Mark Air Date 12/16/20

Project / Client FAI/DOT

Personnel: K. Siard G. Wade

Weather: Windy 5-10 mph, -10 to 0 F

objectives: Sample GW

PPE: modified D

0715 Arr. at office

0750 Calibrated Turbidity meter

0755 Calibrated air monitoring multi meter RO & Bump test

0756 Calibrated YSI - same as yesterday

pH 4.01 (same Lot#)
actual pH 3.89,

pH 10.0 7.00 (same bottle as yesterday)
actual 7.05, calib. to 7.00

pH 10.01 PN: 00654-08 Exp:
actual 10.15 Lot#: CC635213 8/13/21

Cond: same bottle as yesterday
1413 µs/cm Temp: 21 °C
actual 1409 mS/cm 1310 µs/cm

ORP: Lot # 1422 exp 04/22
+20 240 mV actual 240.3

0825 Departed office for MW-12 well 152
Set up at MW-12

0913 Started pump DTW 8.96' btoc
Cloudy, orange-brown, turbid

0943 Stabilized

Location Mark Air Date 12/16/20

Project / Client DOT / Airport

0945 Started sampling DNA/MI for MW-12
Finished sampling, IDW 3 gals in drum
Set up at MW-9, purged

11:15 Kari Hagen came by to grab DNA/MI samples → fed Ex

12:00 K. Siard ran to get batteries

12:30 Sampled at MW-9
sample 20MAW-MW9-GW
IDW 3 gals into same drum: MAW 1

13:39 Set up at MW-17, G. Wade lunch
purged, stabilized

14:03 to 14:18 Sampled MW-17, dup for Btex
Pump rate was trickier but stabilized quickly.

14:25 Packed up to move to MW-5

15:20 MW-5 Set up, started purging
G. Wade to Brooks Fuel Site BF5 to look for last 3 wells.

16:21 stabilized started sampling
G. Wade came back.

17:00 Finished, packed up IDW 3.5 gals
Decond. d back to office.

17:30 Unpacked, sent sample info to Kari Hagen

18:30 End of day

Rite in the Rain

Location _____ Date _____

Project / Client _____

Location FAI / Mark Air Date 12/15 - 12/18/20

Project / Client DOT

IDW Log - Mark Air 2020 Dec.

Date	well	gals	into drum
12-15-20	MW-8	2.5	MAW #1
12/15/20	MW-3	2.0	MAW 1
12/15/20	MW-10	3.0	MAW 1
12/16/20	MW-12	3.0	
	MW-9	3.0	
	MW-17	2.0	
	MW-5	3.5 (19)	
12/17/20 (BES)	MW-2	2	MAW 1
	MW-5	3	MAW 1
	MW-8	+2 (7)	MAW 1
		26.0	

(MAW)

+0.5 calibration & decon. H2O

Total 26.5 gals emptied into drum MAW 1 at Airport / DOT holding bldg across from Mark Air Warehouse

12/18/20 Final waste = 26.5 total into drum MAW 1 from Dec GW sampling event.

Rite in the Rain

Appendix D
Groundwater Sampling Forms

Appendix E
Analytical Data Tables

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table E-1 2020 and Historical Groundwater Elevations

Monitoring Well ID	Date	Total Depth (feet btoc)	Top of Casing Elevation (feet)	Depth to Water (feet btoc)	Water Table Elevation (feet)
MW-3	9/9/2010	--	431.21	--	--
	9/10/2010	19.49	--	7.92	423.29
	10/18/2010	--	--	10.19	421.02
	11/15/2010	--	--	--	--
	7/24/2012	--	431.22	6.71	424.51
	9/5/2012	--	--	8.8	422.42
	9/6/2013	--	--	7.88	423.34
	10/11/2016	19.49	431.24	9.24	422
	8/28/2018	19.39	--	6.38	--
	12/15/2020	*19.28*	*430.94*	*9.63*	*421.31*
MW-5	9/9/2010	--	430.97	--	--
	9/10/2010	17.09	--	7.18	423.79
	10/18/2010	--	--	9.64	421.33
	11/15/2010	--	--	10.79	420.18
	7/24/2012	--	430.97	6.4	424.57
	9/5/2012	--	--	8.31	422.66
	9/5/2013	--	--	7.58	423.39
	11/7/2013	--	--	10.46	420.51
	10/11/2016	16.99	430.95	8.6	422.35
	8/28/2018	16.99	--	5.96	--
	12/15/2020	*17.00*	*430.68*	*9.10*	*421.58*
MW-8	9/9/2010	--	432.06	--	--
	9/10/2010	19.44	--	8.48	423.58
	10/18/2010	--	--	11.03	421.03
	11/15/2010	--	--	12.15	419.91
	7/24/2012	--	431.74	7.25	424.49
	9/5/2012	--	--	9.36	422.38
	9/5/2013	--	--	8.69	423.05
	11/7/2013	--	--	11.52	420.22
	10/11/2016	19.19	431.74	9.73	422.01
	8/28/2018	19.09	--	6.98	--
	12/15/2020	*18.75*	*431.60*	*10.36*	*421.24*
MW-9	9/9/2010	--	431.1	--	--
	9/10/2010	17.3	--	7.55	423.55
	10/18/2010	--	--	10.16	420.94
	11/15/2010	--	--	11.21	419.89
	7/24/2012	--	430.9	6.44	424.46
	9/5/2012	--	--	8.55	422.35
	9/5/2013	--	--	7.81	423.09
	10/11/2016	17.05	431.04	9.08	421.96
	8/28/2018	16.95	--	6.34	--
	12/16/2020	*16.58*	*430.97*	*9.73*	*421.24*
MW-10	9/9/2010	--	432.66	--	--
	9/10/2010	17.67	--	9.04	423.62
	10/18/2010	--	--	11.62	421.04
	11/15/2010	--	--	12.82	419.84
	7/24/2012	--	432.59	8.07	424.52
	9/5/2012		--	10.14	422.45
	9/5/2013	--	--	9.33	423.26
	9/6/2013	--	432.49	9.13	423.36
	11/7/2013	--	--	12.56	419.93
	10/11/2016	17.50	432.45	10.38	422.07
	8/28/2018	17.50	--	7.69	--
	12/15/2020	*16.70*	*432.30*	*10.95*	*421.35*
MW-12	9/9/2010	--	430.71	--	--
	9/10/2010	18.03	--	7.17	423.54
	10/18/2010	--	--	9.76	420.95
	11/15/2010	--	--	10.83	419.88
	7/24/2012	--	430.6	6.14	424.46
	9/5/2012	--	--	8.26	422.34
	9/6/2013	--	--	7.52	423.08
	11/7/2013	--	--	10.46	420.14
	10/11/2016	17.86	430.51	8.55	421.96
	8/28/2018	17.86	--	5.75	--
	12/16/2020	*17.72*	*430.25*	*9.01*	*421.24*

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table E-1 2020 and Historical Groundwater Elevations

Monitoring Well ID	Date	Total Depth (feet btoc)	Top of Casing Elevation (feet)	Depth to Water (feet btoc)	Water Table Elevation (feet)
MW-17	9/5/2013	14.53	--	9.16	--
	10/11/2016	14.36	432.28	10.2	422.08
	8/28/2018	14.36	--	7.4	--
	12/16/2020	*14.45*	*431.98*	*10.64*	*421.34*

Notes:

-- = Not applicable/data not collected

btoc = below top of casing

For definitions, refer to the Acronyms and Abbreviations section.

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table E-2 2020 and Historical Groundwater Sample Analytical Results - Fuels and BTEX (µg/L)

			Alaska Methods			BTEX EPA Method SW8021 or SW8260			
Well ID	**Sample ID**	**Date Sampled**	**AK101**	**AK102**	**AK103**	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**
			GRO	**DRO**	**RRO**				
ADEC Groundwater Cleanup Levels[A] (µg/L)			**2,200**	**1,500**	**1,100**	**4.6**	**1,100**	**15**	**190**
MW-3	MW-3	10/13/2004	ND	ND	--	--	--	--	--
	MW-3	August 2008	ND [100]	712	--	ND [0.5]	ND [2]	ND [2]	ND [4]
	MW-3	9/15/2010	ND [62.0]	ND [500]	ND [300]	ND [0.3]	ND [1.24]	ND [1.24]	ND [1.24]
	MW-3	7/25/2012	ND [62.0]	631	296 J	0.480 J	ND [0.620]	ND [0.620]	ND [1.24]
	MW-3	9/6/2013	ND [62.0]	250 J	--	ND [0.3]	ND [0.620]	ND [0.620]	ND [1.86]
	MW-03	11/11/2016	ND [31.0]	237 J	ND [147]	ND [0.150]	ND [0.310]	ND [0.310]	ND [0.930]
	MW-3	8/28/2018	ND [31.0]	414 J	372 J	ND [0.150]	ND [0.310]	ND [0.310]	ND [0.930]
	MW-3	*12/15/2020*	*ND [50]*	*244 [300] J*	*361 [250] J*	*0.19 [0.25] J*	*ND [0.5]*	*ND [0.5]*	*ND [1.5]*
MW-5	MW-5	August 2008	ND [100]	ND [400]	--	ND [0.5]	ND [2]	ND [2]	ND [4]
	MW-5	9/14/2010	ND [62.0]	ND [472]	ND [284]	ND [0.3]	ND [1.24]	ND [1.24]	ND [1.24]
	MW-5	7/24/2012	ND [62.0]	495 J	ND [300]	ND [0.3]	ND [0.620]	ND [0.620]	ND [1.24]
	MW-05	11/12/2016	ND [31.0]	ND [173]	ND [144]	ND [0.150]	ND [0.310]	ND [0.310]	ND [0.930]
	MW-205*	11/12/2016	ND [31.0]	ND [173]	ND [144]	ND [0.150]	ND [0.310]	ND [0.310]	ND [0.930]
	MW-5	8/28/2018	ND [31.0]	189 J	174 J	ND [0.150]	ND [0.310]	ND [0.310]	ND [0.930]
	MW-5	*12/16/2020*	*ND [50]*	*235 [294] J*	*404 [245] J*	*ND [0.25]*	*ND [0.5]*	*ND [0.5]*	*0.98 [1.5] J*
MW-8	MW-8	10/13/2004	**20,900**	**1,970**	--	**3,860**	51.7	**1,410**	**4,080**
	MW-8-WEAVER	9/11/2005	**6,800**	1,050	--	**1,930**	21.8	**430**	**1,200**
	MW-10*	9/11/2005	**8,500**	1,150	--	**2,000**	22	**547**	**1,480**
	MW-8	August 2008	**2,330**	950	--	**584**	6.37	**108**	**235.8**
	MW-8*	August 2008	**2,290**	1,110	--	**633**	7.12	**121**	**272.1**
	MW-8	9/15/2010	1,800	571 J	ND [288]	**459**	3.29	**147**	**269**
	MW-8	7/25/2012	655	329 J	ND [300]	**148**	1.08	**39.2**	55.5 J
	MW-8	9/18/2012	**6,790**	1,240	ND [300]	**1,380**	25.6	**385**	**1,150**
	MW-8	10/17/2012	**8,720**	1,390	ND [300]	**1,280**	16.9	**527**	**1,784**
	MW-8	11/15/2012	**8,500**	**2,030**	241 J	**1,210**	45.7	**633**	**2,152**
	MW-8	9/5/2013	**5,990**	982	--	**907**	46.3	**326**	**1,016**
	MW-08	11/11/2016	**6,570**	**1,780**	ND [144]	**2,240 J**	9.5 J	**467**	**1,150**
	MW-208*	11/11/2016	--	--	--	**4,490 J**	9.2 J	**447**	**1,110**
	MW-8	8/28/2018	**3,310**	1,330	462 J	**373**	11.8 J	**247**	**859**
	MW-98*	8/28/2018	**3,030**	1,040	232 J	**363**	3.64 J	**234**	**802** [B]
	MW-98*	8/28/2018	**3,030**	1,040	232 J	**363**	3.64 J	**234**	**802** [B]
	MW-9	*12/15/2020*	***2,390 [250]***	*1,050 [294]*	*472 [245] J*	***393 [1]***	*7.94 [2.5]*	***196 [2.5]***	***370 [7.5]***
MW-9	MW-9	10/13/2004	--	--	ND	4.58	ND	ND	ND
	WP-1A*	10/13/2004	--	ND	--	4.49	--	--	--
	MW-9	9/12/2005	ND	164	--	0.557	ND	ND	ND
	MW-9	August 2008	ND [100]	ND [400]	--	0.62	ND [2]	ND [2]	ND [4]
	MW-9	9/15/2010	ND [62.0]	ND [500]	ND [300]	3.7	ND [1.24]	ND [1.24]	ND [1.24]
	MW-9	7/24/2012	ND [62.0]	484 J	ND [300]	2.02	ND [0.620]	ND [0.620]	ND [1.24]
	MW-9	9/18/2012	47 J	276 J	ND [300]	**6.71**	ND [0.620]	ND [0.620]	ND [1.24]
	MW-9	10/17/2012	32.4 J	344 J	ND [300]	2.83	ND [0.620]	ND [0.620]	ND [1.24]
	MW-9	11/15/2012	ND [62.0]	718	ND [300]	0.79	ND [0.620]	0.00057 J	1.98 J
	MW-9	9/5/2013	ND [62.0]	329 J	--	1.83	ND [0.620]	ND [0.620]	ND [1.86]
	MW-09	11/11/2016	56.3 J	208 J	ND [147]	3.44	ND [0.310]	ND [0.310]	ND [0.930]
	MW-9	8/28/2018	ND [31.0]	241 J	202 J	ND [0.150]	ND [0.310]	ND [0.310]	ND [0.930]
	MW-9	*12/16/2020*	*ND [50]*	*412 [334] J*	*438 [278] J*	*ND [0.25]*	*0.37 [0.5] J*	*ND [0.5]*	*1.22 [1.5] J*

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table E-2 2020 and Historical Groundwater Sample Analytical Results - Fuels and BTEX (µg/L)

			Alaska Methods			BTEX EPA Method SW8021 or SW8260			
Well ID	Sample ID	Date Sampled	AK101 GRO	AK102 DRO	AK103 RRO	Benzene	Toluene	Ethylbenzene	Xylenes
ADEC Groundwater Cleanup Levels[A] (µg/L)			2,200	1,500	1,100	4.6	1,100	15	190
MW-10	MW-10	September 2008	**42,900**	**5,150**	--	**3,450**	**12,300**	**1,710**	**9,860**
	MW-10	9/15/2010	**3,750**	1,100	ND [300]	**185**	ND [0.620]	**362**	**485**
	MW-10	7/25/2012	1,550	886	ND [300]	**25.4** [B]	73	**68.2**	**349**
	MW-910*	7/25/2012	--	--	--	**23.2**	78.7	**63**	**337**
	MW-10	9/18/2012	**33,600**	**4,030**	ND [300]	**1,320**	**6,610**	**1,050**	**6,580**
	MW-10	10/17/2012	**28,100**	**6,120**	ND [300]	**752**	**4,420**	**963**	**5,970**
	MW-10	11/15/2012	**34,400**	**8,560**	**4,480**	**978**	**6,970**	**1,450**	**8,570**
	MW-10	9/5/2013	**16,700**	**5,140**	--	**735**	**1,920**	**571**	**3,660**
	MW-10	10/11/2016	**19,900**	**5,290**	ND [153]	**1,060**	**4,570**	**665**	**6,420**
	MW-10	8/28/2018	**32,600**	**8,360**	731	**1,610**	**5,140** [B]	**872** [B]	**8,250** [B]
	MW-10	*12/15/2020*	***28,400 [2,500]***	***14,800 [300]***	***1,300 [250]***	***809 [2]***	***4,940 [25]***	***941 [5]***	***8,090 [75]***
	MW-10A*	*12/15/2020*	***29,000 [2,500]***	***14,400 [326]***	***1,200 [272]***	***824 [2]***	***4,960 [25]***	***947 [5]***	***8,200 [75]***
MW-12	MW-12	September 2008	321	520	--	**109**	6.57	**15.3**	25.2
	MW-12*	September 2008	331	446	--	**113**	1.25	14.8	20.5
	MW-12	9/15/2010	43.9 J	295 J	ND [268]	2.74	ND [1.24]	ND [1.24]	1.98 J
	MW-912 *	9/15/2010	ND [62.0]	464 J	ND [292]	2.68	ND [1.24]	ND [1.24]	ND [1.24]
	MW-12	7/25/2012	170	399 J	ND [300]	**56**	ND [0.620]	ND [0.620]	13.9
	MW-912 *	7/25/2012	176	200 J	ND [300]	**56.2**	ND [0.620]	ND [0.310]	14.9
	MW-12	9/18/2012	382	326 J	ND [300]	**104**	0.48 J	14.2	48.1
	MW-22 *	9/18/2012	361	283 J	ND [300]	**101**	0.45 J	13.3	45.2
	MW-12	10/17/2012	391	685	264 J	**110**	ND [0.620]	6.92	39.7
	MW-22 *	10/17/2012	440	469 J	ND [300]	**128**	ND [0.620]	9.3	48.1
	MW-12	11/15/2012	505	1030	ND [300]	**145**	0.34 J	11.1	50.1 J
	MW-22 *	11/15/2012	452	907	ND [300]	**133**	ND [0.620]	9.79	44.89 J
	MW-12	9/5/2013	80.4 J	240 J	--	**22.4**	ND [0.620]	ND [0.620]	2.49 J
	MW-99 *	9/5/2013	110	322 J	--	**30.5**	ND [0.620]	0.31 J	2.81 J
	MW-12	10/11/2016	70.1 J	243 J	ND [153]	4.01	ND [0.310]	0.85 J	8.46
	MW-212*	10/11/2016	57.5 J	284 J	ND [150]	3.63	ND [0.310]	0.71	7.03
	MW-12	8/28/2018	ND [31.0]	387 J	232 J	ND [0.150]	ND [0.310]	ND [0.310]	ND [0.930]
	MW-12	*12/16/2020*	*36.4 [50] J*	*603 [319] J*	*350 [266] J*	*1.7 [0.25]*	*1.06 [0.5]*	*0.42 [0.5] J*	*4.71 [1.5]*
MW-17	MW-17	8/6/2012	ND [62.0]	**2,110**	245 J	0.230 J	ND [0.620]	0.310 J	0.390 J
	MW-17	9/18/2012	ND [62.0]	**4,900**	956	ND [0.30]	ND [0.620]	ND [0.620]	ND [1.24]
	MW-17	10/17/2012	ND [62.0]	**4,920**	**1,650**	ND [0.30]	ND [0.620]	ND [0.620]	ND [1.24]
	MW-17	11/15/2012	146	**5,200**	**1,290**	1.39	11.7	3.98	29.5
	MW-17	9/5/2013	ND [62.0]	**4,960**	--	ND [0.30]	ND [0.620]	ND [0.620]	ND [1.86]
	MW-17	10/11/2016	ND [31.0]	**1,900**	543	ND [0.150]	ND [0.310]	ND [0.310]	ND [0.930]
	MW-17	8/28/2018	ND [31.0]	**3,580**	956	ND [0.150]	0.758 J	0.451 J	3.81
	MW-17	*12/16/2020*	*ND [50]*	***3,050 [313]***	***3,620 [261]***	*ND [0.25]*	*0.34 [0.5] J*	*ND [0.5]*	*1.16 [1.5] J*
	*MW-17A**	*12/16/2020*	--	--	--	*ND [0.25]*	*0.34 [0.5] J*	*ND [0.5]*	*1.08 [1.5] J*

Notes:

[A] ADEC Groundwater Cleanup Levels (18 AAC 75, Table C) (ADEC 2021).

[B] Reported result is from the SW8260 analysis because the result was greater than the SW8021 results and

* Sample is a field duplicate of the preceding sample with the same date.

-- Sample not analyzed for this contaminant.

J = Result is an estimated value because it was greater than the method detection limit but less than the LOQ.

Bold = Result exceeds the ADEC GCLs.

Italics = Result is from 2020 sampling event.

Historical values taken from prior groundwater monitoring report (DOT&PF 2018)

Abbreviations:

µg/L = micrograms per liter

ADEC = Alaska Department of Environmental Conservation

GCL = groundwater cleanup level

BTEX = benzene, toluene, ethylbenzene and xylenes

DRO = diesel-range organics

EPA = U.S. Environmental Protection Agency

GRO = gasoline-range organics

LOD = limit of detection

LOQ = limit of quanititation

ND = nondetect

RRO = residual-range organics

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table E-3 2020 and Historical Groundwater Analytical Results - Volatile Organic Compounds (µg/L)

Well ID	Sample ID	Date Sampled	EDB[B]	MEK	1,2-Dichlorobenzene	EDC	1,2,4-TMB	1,3,5-TMB	4-Isopropyltoluene	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Chloromethane	Chloroform	Dichlorodifluoromethane	Trichlorofluoromethane	Isopropylbenzene (Cumene)	Naphthalene	Propylbenzene
ADEC GCL[A] (µg/L)			**0.075**	**5600**	**300**	**1.7**	**56**	**60**	**N/A**	**1,000**	**2,000**	**690**	**190**	**2.2**	**200**	**5200**	**450**	**1.7**	**660**
	Monitoring Well MW-2 Removed on September 13, 2013																		
MW-3	MW-3	10/13/2004	ND [1.00]	ND [10]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [5.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]	ND [1.00]
	MW-3	9/15/2010[C]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-3	*12/15/2020*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	MW-5	9/14/2010[C]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-5	*12/15/2020*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	MW-8	10/13/2004	**0.543**	16.2	ND [1.00]	**32.4**	**916**	**229**	23.5	32	ND [1.00]	5	ND [5.00]	ND [1.00]	ND [1.00]	ND [1.00]	102	**318**	153
	MW-8-WEAVER	9/11/2005	ND [1.00]	ND [10]	ND [1.00]	ND [0.500]	**491**	**127**	3.79	5.47	6.4	2.34	ND [1.00]	ND [1.00]	1.1	ND [1.00]	58.8	**108**	84.5
	MW-10 *	9/11/2005	ND [1.00]	ND [10]	ND [1.00]	ND [0.500]	**503**	**134**	3.74	5.52	6.38	2.31	ND [1.00]	ND [1.00]	1.15	ND [1.00]	52.4	**125**	89.5
	MW-8	August 2008	ND [1.00]	--	--	**4.92**	**75.4**	15.9	3.41	2.06	1.65	ND [1.00]	--	--	2.07 J	ND [1.00]	15.3	**29.9**	21.3
	MW-8 *	August 2008	ND [1.00]	--	--	**5.12**	**80.8**	17.7	3.64	2.59	1.81	ND [1.00]	--	--	2.24 J	ND [1.00]	16.3	**33.9**	22.8
	MW-8	9/15/2010	ND [0.0184]	ND [6.20]	0.320 J	**3.01**	**109**	15.6	3.84	3.22	2.23	1.09	0.860 J	ND [0.600]	2.07	ND [.620]	19.2	**43.3**	32.3
	MW-8	9/5/2013	ND [0.620]	ND [6.20]	ND [0.620]	**5.92**	**418**	**104**	13.9	11	5.96	2.57	ND [.620]	ND [0.600]	0.600 J	ND [.620]	51.8	**135**	67
	MW-89 *	9/5/2013	ND [0.620]	ND [6.20]	ND [0.620]	**5.76**	**447**	**117**	15	12.1	6.35	2.7	ND [.620]	ND [0.600]	0.590 J	ND [.620]	55.1	**133**	77
	MW-08	10/11/2016	**0.2**	ND [50.0]	ND [5.00]	**10**	**470**	**171**	20.3	ND [5.00]	10.9	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	79.6	**182**	120
	MW-208*	10/11/2016	**0.2**	ND [50.0]	ND [5.00]	**10.4**	**472**	**172**	21.3	ND [5.00]	11.6	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	ND [5.00]	80.1	**191**	121
	MW-8	8/28/2018	ND [0.014]	ND [0.310]	ND [0.310]	**2.4**	**311**	**85**	10.3	ND [0.310]	4.54	1.87	ND [0.310]	ND [0.310]	ND [0.310]	ND [0.310]	35.6	**94**	64.1
	MW-98*	8/28/2018	ND [0.014]	ND [0.310]	ND [0.310]	**2.35**	**330**	**91**	10.9	ND [0.310]	4.76	ND [0.310]	ND [0.310]	ND [0.310]	ND [0.310]	ND [0.310]	36.5	**98**	68.4
	MW-8	*12/15/2020*	*ND [0.0125] E*	*ND [25]*	*ND [2.5]*	***3.04 [1.25]***	***153 [2.5]***	*39.7 [2.5]*	*7.87 [2.5]*	*ND [2.5]*	*4.22 [2.5] J*	*1.95 [2.5] J*	*ND [2.5]*	*ND [2.5] E*	*ND [2.5]*	*ND [2.5]*	*35.3 [2.5]*	***72.3 [2.5]***	*53.4 [2.5]*
MW-9	MW-9	10/13/2004[C]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	WP-1A *	10/13/2004[C]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-9	9/15/2010[C]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-9	12/16/2020	ND [0.0025]	--	--	ND [0.25]	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	MW-10	September 2008	**79.3 J**	**--**	--	ND [0.500]	**1790**	**535**	64	47.8	24.8	6.54	--	--	1.23 J	ND [1.00]	120	**568**	220
	MW-10	9/15/2010	**0.854**	ND [6.20]	ND [0.620]	ND [0.300]	3.23	9.86	0.940 J	ND [0.620]	0.620 J	ND [0.620]	0.670 J	ND [0.600]	ND [0.620]	ND [.620]	20.7	**2.51**	5.12
	MW-10	7/25/2012	**0.211**	ND [6.20]	ND [0.620]	ND [0.300]	**117**	39.8	7.84	6.56	3.41	0.950 J	1.04	ND [0.600]	1.44	ND [0.620]	11.6	**38.1**	20.5
	MW-910	7/25/2012	**0.183**	ND [6.20]	ND [0.620]	ND [0.300]	**120**	30.8	2.04	5.19	2.62	0.800 J	0.540 J	ND [0.600]	1.51	ND [0.620]	9.41	**30.3**	16.2
	MW-10	9/6/2013	**11**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-109 *	9/6/2013	**10**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-10	10/11/2016	**18**	ND [5.00]	ND [0.500]	ND [0.25]	**1,250**	**294**	17.9	ND [0.500]	21.5	ND [0.500]	ND [0.500]	ND [0.500]	ND [0.500]	1.61	64.8	**302**	123
	MW-10	8/28/2018	**12**	ND [31.0]	ND [3.10]	ND [1.50]	**1,700**	**460**	60.3	ND [3.10]	18.9	ND [3.10]	ND [3.10]	ND [3.10]	ND [3.10]	ND [3.10]	79.5	**436**	151
	MW-10	*12/15/2020*	***3.8 [0.025]***	*ND [50]*	*ND [5]*	*ND [2.5] E*	***1,640 [5]***	***424 [5]***	*12.2 [5]*	*ND [5]*	*18.7 [5]*	*6.15 [5] J*	*ND [5]*	*ND [5] E*	*ND [5]*	*ND [5]*	*83.7 [5]*	***454 [5]***	*146 [5]*
	MW-10A *	*12/15/2020*	***3.89 [0.025]***	*ND [50]*	*ND [5]*	*ND [2.5] E*	***1,650 [5]***	***426 [5]***	*12.4 [5]*	*ND [5]*	*19.6 [5]*	*6.18 [5] J*	*ND [5]*	*ND [5] E*	*ND [5]*	*ND [5]*	*83.2 [5]*	***463 [5]***	*145 [5]*
MW-12	MW-12	September 2008	ND [1.00]	--	--	1.68	13.8	6.05	2.47	ND [1.00]	ND [1.00]	ND [1.00]	--	--	1.79 J	ND [1.00]	4.69	**8.04**	3.86
	MW-12 *	September 2008	ND [1.00]	--	--	**1.7**	12.9	4.29	1.96	ND [1.00]	ND [1.00]	ND [1.00]	--	--	1.74 J	ND [1.00]	4.47	ND [2.00]	4.13
	MW-12	9/15/2010	ND [0.0196]	ND [6.20]	0.320 J	0.83	1.12	ND [0.620]	0.740 J	ND [0.620]	0.570 J	0.480 J	ND [0.620]	ND [0.600]	2.21	ND [.620]	1.86	ND [1.24]	0.440 J
	MW-912 *	9/15/2010[C]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-12	*12/16/2020*	*ND [0.0025]*	--	--	*0.378 [0.25] J*	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-17	MW-17	*12/16/2020*	ND [0.0025]	--	--	ND [0.25]	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-17A *	*12/16/2020*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

[A] ADEC Groundwater Cleanup Levels (18 AAC 75, Table C) (ADEC 2021).

[B] The maximum detected concentration using EPA Method SW8260, 504.1, or 8011 was reported per the 2018 groundwater monitoring report (DOT&PF)

[C] Sample was not analyzed for VOCs by Method 8260.

E = The result was nondetect and the LOD exceeds the GCL

J = The result is an estimated value because it was greater than the method detection limit but less than the LOQ

-- = Sample was not analyzed for the contaminant

* = Sample is a duplicate of preceding sample.

[ ] = The laborartory LOQ is presented in brackets for ND results using Method 504.1 and for pre-2010 ND results; the LOD is presented in brackets for all other ND and detected results

Bold = Result exceeds ADEC GCLs.

Italic = Result is from the 2020 sampling event.

VOC results that are not presented in this table were not detected in groundwater samples.

Abbreviations:

AAC = Alaska Administrative Code

ADEC = Alaska Department of Environmental Conservation

EDB = 1,2-dibromoethane

EDC = 1,2-dichloroethane

EPA = U.S. Environmental Protection Agency

GCL = groundwater cleanup leve

LOD = limit of detection

LOQ = limit of quantiation

MEK = 2-butanone

ND = nondetect

RRO = residual-range organics

TMB = trimethylbenzene

VOC = volatile organic compound

µg/L = micrograms per liter

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table E-4 2020 and Historical 2018 Groundwater Sample Analytical Results - Polycyclic Aromatic Hydrocarbons (µg/L)

EPA Method 8270 SIM LV (PAH)

		Location ID:	MW-8	MW-98*	MW8	MW-10	MW10	MW10*
		Sample ID:	MW-8	MW-98*	20MAW-MW8-GW	MW-10	20MAW-MW10-GW	20MAW-MW10-GWA
		Sample Date:	8/28/2018	8/28/2018	12/15/2020	8/28/2018	12/15/2020	12/15/2020
Method	**Analyte**	**ADEC GCL[A] (µg/L)**						
SW8270D SIM LV (PAH)	1-Methylnaphthalene	11	10.6	9.6	9.38 [0.0284]	**86.9**	**99.3 [0.481]**	**118 [0.505]**
SW8270D SIM LV (PAH)	2-Methylnaphthalene	36	8.63	7.37	7.09 [0.0284]	**115**	**137 [0.481]**	**165 [0.505]**
SW8270D SIM LV (PAH)	Acenaphthene	530	0.0598	0.0583	0.0401 [0.0284] J	0.439	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Acenaphthylene	260	ND [0.0142]	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Anthracene	43	ND [0.0142]	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Benzo(a)anthracene	0.3	ND [0.0142]	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Benzo(a)pyrene	0.25	ND [0.00585]	ND [0.00630]	ND [0.0114]	ND [0.00608]	ND [0.0096]	ND [0.0101]
SW8270D SIM LV (PAH)	Benzo(b)fluoranthene	2.5	ND [0.0142]	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Benzo(g,h,i)perylene	0.26	ND [0.0142]	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Benzo(k)fluoranthene	0.8	ND [0.0142]	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Chrysene	2	ND [0.0142]	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Dibenzo(a,h)anthracene	0.25	ND [0.00585]	ND [0.00630]	ND [0.0114]	ND [0.00608]	ND [0.0096]	ND [0.0101]
SW8270D SIM LV (PAH)	Fluoranthene	260	0.0308 J	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8270D SIM LV (PAH)	Fluorene	290	ND [0.0142]	ND [0.0152]	ND [0.0284]	0.588	0.938 [0.024]	0.82 [0.0252]
SW8270D SIM LV (PAH)	Indeno(1,2,3-cd)pyrene	0.19	ND [0.0142]	ND [0.0152]	ND [0.0284]	ND [0.0147]	ND [0.024]	ND [0.0252]
SW8260D	Naphthalene	1.7	**49.6**	**49.1**	**72.3 [2.5]**	**230**	**454 [5]**	**463 [5]**
SW8270D SIM LV (PAH)	Phenanthrene	170	0.0267 J	ND [0.0152]	0.0225 [0.0284] J	0.154	0.273 [0.024]	0.255 [0.0252]
SW8270D SIM LV (PAH)	Pyrene	120	0.0253 J	ND [0.0152]	ND [0.0284]	ND [0.0147]	0.0204 [0.024] J	0.0202 [0.0252] J

Notes:

Bold = Result exceeds ADEC GCL.

A = ADEC Groundwater Cleanup Le\

[ ] = The laboratory LOD is presented in brackets for ND results

* = Sample is a field duplicate of sample taken on the same date

J = = Result is an estimated value gr e LOQ

2020 results are from this study (Jacobs); 2018 results are from groundwater monitoring report (DOT&PF 2018

For other definitions, refer to the Acronyms and Abbreviations section

Abbreviations:

AAC = Alaska Administrative Code

ADEC = Alaska Department of Environmental Conservation

GCL = groundwater cleanup level

LOD = limit of detection

LOQ = limit of quantitation

ND = nondetect

PAH = polycyclic aromatic hydrocarbons

µg/L = microgram(s) per liter

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table E-5 2020 Groundwater Sample Microbial Analysis Genetic Results (cells/mL)

Summary of the QuantArray-Petro results

Well Location:	MW-5	MW-8	MW-10	MW-12
Sample Date:	12/16/2020	12/15/2020	12/15/2020	12/16/2020
Aerobic BTEX and MTBE				
Toluene/Benzene Dioxygenase (TOD)	ND [4.50]	ND [5.00]	**24.3**	ND [5.00]
Phenol Hydroxylase (PHE)	ND [4.50]	**5,070**	**47,100**	**22,800**
Toluene 2 Monooxygenase/Phenol Hydroxylase (RDEG)	ND [4.50]	**2,700**	**93,400**	ND [5.00]
Toluene Ring Hydroxylating Monooxygenases (RMO)	ND [4.50]	**7,170**	**50,900**	**117**
Xylene/Toluene Monooxygenase (TOL)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Ethylbenzene/Isopropylbenzene Dioxygenase (EDO)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Biphenyl/Isopropylbenzene Dioxygenase (BPH4)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Methylibium petroleiphilum PM1 (PM1)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
TBA Monooxygenase (TBA)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Aerobic PAHs and Alkanes				
Naphthalene Dioxygenase (NAH)	ND [4.50]	**5.80**	ND [7.10]	ND [5.00]
Naphthalene-inducible Dioxygenase (NidA)	ND [4.50]	**39.9**	ND [7.10]	ND [5.00]
Phenanthrene Dioxygenase (PHN)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Alkane Monooxygenase (ALK)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Alkane Monooxygenase (ALMA)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Anaerobic BTEX				
Benzoyl Coenzyme A Reductase (BCR)	**213**	**2,120**	**937**	**1,580**
Benzylsuccinate Synthase (BSS)	**82**	**6,400**	**11,700**	**380**
Benzene Carboxylase (ABC)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Anaerobic PAHs and Alkanes				
Naphthylmethylsuccinate Synthase (MNSSA)	ND [4.50]	**5,160**	**1,330**	**886**
Naphthalene Carboxylase (ANC)	ND [4.50]	ND [5.00]	ND [7.10]	ND [5.00]
Alkylsuccinate Synthase (ASSA)	ND [4.50]	**39**	**165**	**686**
Other (Bacteria)				
Total Eubacteria (EBAC)	**439,000**	**2,870,000**	**36,300,000**	**1,010,000**
Sulfate Reducing Bacteria (APS)	**3,490**	**52,900**	**40,900**	**45,400**

Notes:

Bold results are above detection limits for ease of viewing

[ ] LOD is presented in brackets for ND results.

See Appendix F Genetic Results for detailed charts, tables, and explanations

Abbreviations:

BTEX = benzene, toluene, ethylbenzene, and xylenes
LOD = limit of detection
mL = milliliters
MTBE = methyl-t-butyl ether
ND = nondetect
PAHs = polycyclic aromatic hydrocarbons

Appendix F
Data Quality Assessment

Attachment F-1

Analytical Results Tables, ADEC Data Review Checklists, and Laboratory Reports

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.1 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Summary

Site	CoC Number	Laboratory	Laboratory SDG	Sample ID	Location ID	Collection Date	Collection Time	Sampler	Qty	Container Type	Container Volume	Preservation	Matrix	Analytical Method	QC Type	TAT (days)	Notes
ADOT MAW	20ADOT-MAW01	Microbial Insights	096RL	20MAW-MW8-GW	MW8	15-Dec-20	1036	GW/KS	1	Poly, Bio-Flo Filters	50mL	<6°C	GW	QuantArray Petro		14 Day	Volume Filtered: 1L
ADOT MAW	20ADOT-MAW01	Microbial Insights	096RL	20MAW-MW12-GW	MW12	16-Dec-20	0945	GW/KS	1	Poly, Bio-Flo Filters	50mL	<6°C	GW	QuantArray Petro		14 Day	Volume Filtered: 1L
ADOT MAW	20ADOT-MAW02	Microbial Insights	096RL	20MAW-MW5-GW	MW5	16-Dec-20	1621	GW/KS	1	Poly, Bio-Flo Filters	50mL	<6°C	GW	QuantArray Petro		14 Day	Volume Filtered: 1.1L
ADOT MAW	20ADOT-MAW02	Microbial Insights	096RL	20MAW-MW10-GW	MW10	15-Dec-20	1536	GW/KS	2	Poly, Bio-Flo Filters	50mL	<6°C	GW	QuantArray Petro		14 Day	Volume Filtered: 0.5, 0.2L
ADOT MAW	20ADOT-MAW03	SGS	1209871	20MAW-MW8-GW	MW8	15-Dec-20	1036	GW/KS	15	VOA	40mL	<6°C; HCl	GW	AK101, SW8260, SW8260 SIM, RSK 175		14 Day	GRO, VOCs, EDB, Methane
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW8-GW	MW8	15-Dec-20	1036	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW8-GW	MW8	15-Dec-20	1036	GW/KS	2	GA	250mL	<6°C	GW	SW8270 SIM		14 Day	PAHs
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW8-GW	MW8	15-Dec-20	1036	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A		14 Day	Fe, Mn
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW8-GW	MW8	15-Dec-20	1036	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0		14 Day	Sulfate
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW8-GW	MW8	15-Dec-20	1036	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E		14 Day	NO2/NO3, Total Phos
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW3-GW	MW3	15-Dec-20	1343	GW/KS	3	VOA	40mL	<6°C; HCl	GW	AK101, SW8021		14 Day	GRO, BTEX
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW3-GW	MW3	15-Dec-20	1343	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
ADOT MAW	20ADOT-MAW03	SGS	1209871	20MAW-MW10-GW	MW10	15-Dec-20	1536	GW/KS	12	VOA	40mL	<6°C; HCl	GW	AK101, SW8260, SW8260 SIM, RSK 175		14 Day	GRO, VOCs, EDB, Methane
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GW	MW10	15-Dec-20	1536	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GW	MW10	15-Dec-20	1536	GW/KS	2	GA	250mL	<6°C	GW	SW8270 SIM		14 Day	PAHs
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GW	MW10	15-Dec-20	1536	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A		14 Day	Fe, Mn
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GW	MW10	15-Dec-20	1536	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0		14 Day	Sulfate
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GW	MW10	15-Dec-20	1536	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E		14 Day	NO2/NO3, Total Phos
ADOT MAW	20ADOT-MAW03	SGS	1209871	20MAW-MW10-GWA	MW10	15-Dec-20	1536	GW/KS	12	VOA	40mL	<6°C; HCl	GW	AK101, SW8260, SW8260 SIM, RSK 175	Dup	14 Day	GRO, VOCs, EDB, Methane
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GWA	MW10	15-Dec-20	1536	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	Dup	14 Day	DRO/RRO
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GWA	MW10	15-Dec-20	1536	GW/KS	2	GA	250mL	<6°C	GW	SW8270 SIM	Dup	14 Day	PAHs
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GWA	MW10	15-Dec-20	1536	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A	Dup	14 Day	Fe, Mn
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GWA	MW10	15-Dec-20	1536	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0	Dup	14 Day	Sulfate
ADOT MAW	20ADOT-MAW04	SGS	1209871	20MAW-MW10-GWA	MW10	15-Dec-20	1536	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E	Dup	14 Day	NO2/NO3, Total Phos
ADOT MAW	20ADOT-MAW03	SGS	1209871	20MAW-TB01	MAW-TB01	15-Dec-20	0800	GW/KS	9	VOA	40mL	<6°C; HCl	W	AK101, SW8260, SW8260 SIM	TB	14 Day	GRO, VOCs, EDB
ADOT MAW	20ADOT-MAW06	SGS	1209876	20MAW-MW12-GW	MW12	16-Dec-20	0945	GW/KS	12	VOA	40mL	<6°C; HCl	GW	AK101, SW8021, SW8260, SW8260 SIM, RSK 175		14 Day	GRO, BTEX, 1,2-dichloroethane (EDC) Only, EDB, Methane
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW12-GW	MW12	16-Dec-20	0945	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW12-GW	MW12	16-Dec-20	0945	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A		14 Day	Fe, Mn
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW12-GW	MW12	16-Dec-20	0945	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0		14 Day	Sulfate
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW12-GW	MW12	16-Dec-20	0945	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E		14 Day	NO2/NO3, Total Phos
ADOT MAW	20ADOT-MAW06	SGS	1209876	20MAW-MW9-GW	MW9	16-Dec-20	1230	GW/KS	9	VOA	40mL	<6°C; HCl	GW	AK101, SW8021, SW8260, SW8260 SIM		14 Day	GRO, BTEX, EDC Only, EDB
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW9-GW	MW9	16-Dec-20	1230	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
ADOT MAW	20ADOT-MAW06	SGS	1209876	20MAW-MW17-GW	MW17	16-Dec-20	1403	GW/KS	9	VOA	40mL	<6°C; HCl	GW	AK101, SW8021, SW8260, SW8260 SIM		14 Day	GRO, BTEX, EDC Only, EDB
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW17-GW	MW17	16-Dec-20	1403	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
ADOT MAW	20ADOT-MAW06	SGS	1209876	20MAW-MW17-GWA	MW17	16-Dec-20	1403	GW/KS	3	VOA	40mL	<6°C; HCl	GW	SW8021	Dup	14 Day	BTEX Only
ADOT MAW	20ADOT-MAW06	SGS	1209876	20MAW-MW5-GW	MW5	16-Dec-20	1621	GW/KS	6	VOA	40mL	<6°C; HCl	GW	AK101, SW8021, RSK 175		14 Day	GRO, BTEX, Methane
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW5-GW	MW5	16-Dec-20	1621	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW5-GW	MW5	16-Dec-20	1621	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A		14 Day	Fe, Mn
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW5-GW	MW5	16-Dec-20	1621	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0		14 Day	Sulfate
ADOT MAW	20ADOT-MAW07	SGS	1209876	20MAW-MW5-GW	MW5	16-Dec-20	1621	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E		14 Day	NO2/NO3, Total Phos
ADOT MAW	20ADOT-MAW06	SGS	1209876	20MAW-TB02	MAW-TB02	16-Dec-20	0800	GW/KS	9	VOA	40mL	<6°C; HCl	W	AK101, SW8021, SW8260, SW8260 SIM	TB	14 Day	GRO, BTEX, EDC Only, EDB
ADOT MAW/BFS	20ADOT-BFS01	SGS	1209879	20MAW/BFS-EB	MAW/BFS-EB	18-Dec-20	1530	KS	15	VOA	40mL	<6°C; HCl	GW	AK101, SW8260, SW8260 SIM, RSK 175	EB	14 Day	GRO, VOCs, EDB, Methane
ADOT MAW/BFS	20ADOT-BFS01	SGS	1209879	20MAW/BFS-EB	MAW/BFS-EB	18-Dec-20	1530	KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	EB	14 Day	DRO/RRO
ADOT MAW/BFS	20ADOT-BFS01	SGS	1209879	20MAW/BFS-EB	MAW/BFS-EB	18-Dec-20	1530	KS	2	GA	250mL	<6°C	GW	SW8270 SIM	EB	14 Day	PAHs
ADOT MAW/BFS	20ADOT-BFS01	SGS	1209879	20MAW/BFS-EB	MAW/BFS-EB	18-Dec-20	1530	KS	1	Poly	125mL	HNO3	GW	SW6020A	EB	14 Day	Fe, Mn
ADOT MAW/BFS	20ADOT-BFS01	SGS	1209879	20MAW/BFS-EB	MAW/BFS-EB	18-Dec-20	1530	KS	1	Poly	60mL	<6°C	GW	EPA 300.0	EB	14 Day	Sulfate
~~ADOT MAW/BFS~~	~~20ADOT-BFS01~~	~~SGS~~	~~1209879~~	~~20MAW/BFS-EB~~	~~MAW/BFS-EB~~	~~18-Dec-20~~	~~1530~~	~~KS~~	~~1~~	~~Poly~~	~~250mL~~	~~<6°C, H2SO4~~	~~GW~~	~~SM 4500 NO3-F, SM 4500-B,E~~	~~EB~~	~~14 Day~~	~~NO2/NO3, Total Phos~~ (Not sampled-glassware was not available)
ADOT MAW/BFS	20ADOT-BFS01	SGS	1209879	20MAW/BFS-TB01	MAW-TB01	17-Dec-20	0800	GW/KS	9	VOA	40mL	<6°C; HCl	W	AK101, SW8260, SW8260 SIM	TB	14 Day	GRO, VOCs, EDB

Notes:

°C = degrees celcius

CoC = chain of custody

Dup = field duplicate

GW = groundwater

HCl = hydrochloric acid

mL = milliliter

QC = quality control

SDG = sample delivery group

SGS = SGS North America Inc., Anchorage, AK

TAT = turnaround time

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW3	MW5	MW8	MW9
				Sample ID:	20MAW-MW3-GW	20MAW-MW5-GW	20MAW-MW8-GW	20MAW-MW9-GW
				Lab Sample ID:	1209871002	1209876005	1209871001	1209876002
				SDG:	1209871	1209876	1209871	1209876
				Sample Date/Time:	12/15/2020 13:43	12/16/2020 16:21	12/15/2020 10:36	12/16/2020 12:30
				QA/QC:	Primary Sample	Primary Sample	Primary Sample	Primary Sample
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**				
-	AK101	µg/L	GRO	2200	ND [50]	ND [50]	**2390 [250]**	ND [50]
-	AK102	µg/L	DRO	1500	244 [300] J,B	235 [294] J,B	1050 [294] B	412 [334] J,B
-	AK103	µg/L	RRO	1100	361 [250] J,B	404 [245] J,B	472 [245] J,B	438 [278] J,B
74-82-8	RSKSOP-147/175	µg/L	Methane	-	-	77.2 [0.25]	312 [0.25]	-
14808-79-8	EPA 300.0	µg/L	Sulfate	-	-	11000 [100]	6920 [500]	-
-	SM21 4500NO3-F	µg/L	Total Nitrate/Nitrite-N	-	-	1390 [100]	92.4 [100] J,B	-
-	SM21 4500P-B,E	µg/L	Total Phosphorus	-	-	ND [20]	130 [20]	-
7439-89-6	SW6020B	µg/L	Iron	-	-	996 [250]	36800 [500]	-
7439-96-5	SW6020B	µg/L	Manganese	430	-	385 [1]	3910 [2]	-
90-12-0	8270D SIM LV (PAH)	µg/L	1-Methylnaphthalene	11	-	-	9.38 [0.0284]	-
91-57-6	8270D SIM LV (PAH)	µg/L	2-Methylnaphthalene	36	-	-	7.09 [0.0284]	-
83-32-9	8270D SIM LV (PAH)	µg/L	Acenaphthene	530	-	-	0.0401 [0.0284] J	-
208-96-8	8270D SIM LV (PAH)	µg/L	Acenaphthylene	260	-	-	ND [0.0284]	-
120-12-7	8270D SIM LV (PAH)	µg/L	Anthracene	43	-	-	ND [0.0284]	-
56-55-3	8270D SIM LV (PAH)	µg/L	Benzo(a)anthracene	0.3	-	-	ND [0.0284]	-
50-32-8	8270D SIM LV (PAH)	µg/L	Benzo(a)pyrene	0.25	-	-	ND [0.0114]	-
205-99-2	8270D SIM LV (PAH)	µg/L	Benzo(b)fluoranthene	2.5	-	-	ND [0.0284]	-
191-24-2	8270D SIM LV (PAH)	µg/L	Benzo(g,h,i)perylene	0.26	-	-	ND [0.0284]	-
207-08-9	8270D SIM LV (PAH)	µg/L	Benzo(k)fluoranthene	0.8	-	-	ND [0.0284]	-
218-01-9	8270D SIM LV (PAH)	µg/L	Chrysene	2	-	-	ND [0.0284]	-
53-70-3	8270D SIM LV (PAH)	µg/L	Dibenzo(a,h)anthracene	0.25	-	-	ND [0.0114]	-
206-44-0	8270D SIM LV (PAH)	µg/L	Fluoranthene	260	-	-	ND [0.0284]	-
86-73-7	8270D SIM LV (PAH)	µg/L	Fluorene	290	-	-	ND [0.0284]	-
193-39-5	8270D SIM LV (PAH)	µg/L	Indeno(1,2,3-cd)pyrene	0.19	-	-	ND [0.0284]	-
91-20-3	8270D SIM LV (PAH)	µg/L	Naphthalene	1.7	-	-	**43.3 [0.57]**	-
85-01-8	8270D SIM LV (PAH)	µg/L	Phenanthrene	170	-	-	0.0225 [0.0284] J,B	-
129-00-0	8270D SIM LV (PAH)	µg/L	Pyrene	120	-	-	ND [0.0284]	-
71-43-2	SW8021B	µg/L	Benzene	4.6	0.19 [0.25] J	ND [0.25]	-	ND [0.25]
100-41-4	SW8021B	µg/L	Ethylbenzene	15	ND [0.5]	ND [0.5]	-	ND [0.5]
-	SW8021B	µg/L	o-Xylene	-	ND [0.5]	ND [0.5]	-	0.32 [0.5] J
-	SW8021B	µg/L	P & M -Xylene	-	ND [1]	0.71 [1] J	-	0.9 [1] J
108-88-3	SW8021B	µg/L	Toluene	1100	ND [0.5]	ND [0.5]	-	0.37 [0.5] J
1330-20-7	SW8021B	µg/L	Xylenes	190	ND [1.5]	0.98 [1.5] J	-	1.22 [1.5] J
630-20-6	SW8260D	µg/L	1,1,1,2-Tetrachloroethane	5.7	-	-	ND [1.25]	-
71-55-6	SW8260D	µg/L	1,1,1-Trichloroethane	8000	-	-	ND [2.5]	-
79-34-5	SW8260D	µg/L	1,1,2,2-Tetrachloroethane	0.76	-	-	ND [1.25] E	-
79-00-5	SW8260D	µg/L	1,1,2-Trichloroethane	0.41	-	-	ND [1] E	-
75-34-3	SW8260D	µg/L	1,1-Dichloroethane	28	-	-	ND [2.5]	-
75-35-4	SW8260D	µg/L	1,1-Dichloroethene	280	-	-	ND [2.5]	-
563-58-6	SW8260D	µg/L	1,1-Dichloropropene	-	-	-	ND [2.5]	-
96-18-4	SW8260D	µg/L	1,2,3-TCP	0.0075	-	-	ND [2.5] E	-
87-61-6	SW8260D	µg/L	1,2,3-Trichlorobenzene	7	-	-	ND [2.5]	-
95-63-6	SW8260D	µg/L	1,2,4-TMB	56	-	-	**153 [2.5]**	-
120-82-1	SW8260D	µg/L	1,2,4-Trichlorobenzene	4	-	-	ND [2.5]	-
96-12-8	SW8260D	µg/L	1,2-Dibromo-3-chloropropane	-	-	-	ND [25]	-
95-50-1	SW8260D	µg/L	1,2-Dichlorobenzene	300	-	-	ND [2.5]	-

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW3	MW5	MW8	MW9
				Sample ID:	20MAW-MW3-GW	20MAW-MW5-GW	20MAW-MW8-GW	20MAW-MW9-GW
				Lab Sample ID:	1209871002	1209876005	1209871001	1209876002
				SDG:	1209871	1209876	1209871	1209876
				Sample Date/Time:	12/15/2020 13:43	12/16/2020 16:21	12/15/2020 10:36	12/16/2020 12:30
				QA/QC:	Primary Sample	Primary Sample	Primary Sample	Primary Sample
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**				
107-06-2	SW8260D	µg/L	1,2-Dichloroethane	1.7	-	-	**3.04 [1.25]**	ND [0.25]
78-87-5	SW8260D	µg/L	1,2-Dichloropropane	8.2	-	-	ND [2.5]	-
108-67-8	SW8260D	µg/L	1,3,5-TMB	60	-	-	39.7 [2.5]	-
541-73-1	SW8260D	µg/L	1,3-Dichlorobenzene	300	-	-	ND [2.5]	-
142-28-9	SW8260D	µg/L	1,3-Dichloropropane	-	-	-	ND [1.25]	-
106-46-7	SW8260D	µg/L	1,4-Dichlorobenzene	4.8	-	-	ND [1.25]	-
594-20-7	SW8260D	µg/L	2,2-Dichloropropane	-	-	-	ND [2.5]	-
95-49-8	SW8260D	µg/L	2-Chlorotoluene	-	-	-	ND [2.5]	-
591-78-6	SW8260D	µg/L	2-Hexanone	38	-	-	ND [25]	-
106-43-4	SW8260D	µg/L	4-Chlorotoluene	-	-	-	ND [2.5]	-
108-10-1	SW8260D	µg/L	4-Methyl-2-Pentanone	6300	-	-	ND [25]	-
71-43-2	SW8260D	µg/L	Benzene	4.6	-	-	**393 [1]**	-
108-86-1	SW8260D	µg/L	Bromobenzene	62	-	-	ND [2.5]	-
74-97-5	SW8260D	µg/L	Bromochloromethane	-	-	-	ND [2.5]	-
75-27-4	SW8260D	µg/L	Bromodichloromethane	1.3	-	-	ND [1.25]	-
75-25-2	SW8260D	µg/L	Bromoform	33	-	-	ND [2.5]	-
74-83-9	SW8260D	µg/L	Bromomethane	7.5	-	-	ND [12.5] E	-
75-15-0	SW8260D	µg/L	Carbon Disulfide	810	-	-	ND [25]	-
56-23-5	SW8260D	µg/L	Carbon Tetrachloride	4.6	-	-	ND [2.5]	-
108-90-7	SW8260D	µg/L	Chlorobenzene	78	-	-	ND [1.25]	-
75-00-3	SW8260D	µg/L	Chloroethane	21000	-	-	ND [2.5]	-
67-66-3	SW8260D	µg/L	Chloroform	2.2	-	-	ND [2.5] E	-
74-87-3	SW8260D	µg/L	Chloromethane	190	-	-	ND [2.5]	-
542-75-6	SW8260D	µg/L	cis-1,3-Dichloropropene	4.7	-	-	ND [1.25]	-
156-59-2	SW8260D	µg/L	cis-DCE	36	-	-	ND [2.5]	-
98-82-8	SW8260D	µg/L	Cumene	450	-	-	35.3 [2.5]	-
124-48-1	SW8260D	µg/L	Dibromochloromethane	8.7	-	-	ND [1.25]	-
74-95-3	SW8260D	µg/L	Dibromomethane	8.3	-	-	ND [2.5]	-
106-93-4	SW8260D	µg/L	EDB	0.075	-	-	ND [0.188] E	-
100-41-4	SW8260D	µg/L	Ethylbenzene	15	-	-	**196 [2.5]**	-
75-69-4	SW8260D	µg/L	Freon-11	5200	-	-	ND [2.5]	-
76-13-1	SW8260D	µg/L	Freon-113	10000	-	-	ND [25]	-
75-71-8	SW8260D	µg/L	Freon-12	200	-	-	ND [2.5]	-
87-68-3	SW8260D	µg/L	Hexachlorobutadiene	1.4	-	-	ND [2.5] E	-
78-93-3	SW8260D	µg/L	MEK	5600	-	-	ND [25]	-
75-09-2	SW8260D	µg/L	Methylene Chloride	110	-	-	ND [25]	-
1634-04-4	SW8260D	µg/L	Methyl-t-butyl ether	140	-	-	ND [25]	-
91-20-3	SW8260D	µg/L	Naphthalene	1.7	-	-	**72.3 [2.5]**	-
104-51-8	SW8260D	µg/L	n-Butylbenzene	1000	-	-	ND [2.5]	-
-	SW8260D	µg/L	o-Xylene	-	-	-	52.7 [2.5]	-
-	SW8260D	µg/L	P & M -Xylene	-	-	-	317 [5]	-
127-18-4	SW8260D	µg/L	PCE	41	-	-	ND [2.5]	-
99-87-6	SW8260D	µg/L	p-Cymene	-	-	-	7.87 [2.5]	-
103-65-1	SW8260D	µg/L	Propylbenzene	660	-	-	53.4 [2.5]	-
135-98-8	SW8260D	µg/L	sec-Butylbenzene	2000	-	-	4.22 [2.5] J	-
100-42-5	SW8260D	µg/L	Styrene	1200	-	-	ND [2.5]	-

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW3	MW5	MW8	MW9
				Sample ID:	20MAW-MW3-GW	20MAW-MW5-GW	20MAW-MW8-GW	20MAW-MW9-GW
				Lab Sample ID:	1209871002	1209876005	1209871001	1209876002
				SDG:	1209871	1209876	1209871	1209876
				Sample Date/Time:	12/15/2020 13:43	12/16/2020 16:21	12/15/2020 10:36	12/16/2020 12:30
				QA/QC:	Primary Sample	Primary Sample	Primary Sample	Primary Sample
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**				
79-01-6	SW8260D	µg/L	TCE	2.8	-	-	ND [2.5]	-
98-06-6	SW8260D	µg/L	tert-Butylbenzene	690	-	-	1.95 [2.5] J	-
108-88-3	SW8260D	µg/L	Toluene	1100	-	-	7.94 [2.5]	-
542-75-6	SW8260D	µg/L	trans-1,3-Dichloropropene	4.7	-	-	ND [2.5]	-
156-60-5	SW8260D	µg/L	trans-DCE	360	-	-	ND [2.5]	-
75-01-4	SW8260D	µg/L	Vinyl Chloride	0.19	-	-	ND [0.375] E	-
108-05-4	SW8260D	µg/L	Vinyl Acetate	410	-	-	ND [25]	-
1330-20-7	SW8260D	µg/L	Xylenes	190	-	-	**370 [7.5]**	-
106-93-4	SW8260D-SIM	µg/L	EDB	0.075	-	-	ND [0.0125] E	ND [0.0025]

Notes:

[A] ADEC Groundwater Cleanup Levels, Table C (ADEC 2020b).

E = The result was nondetect and the LOD exceeds the groundwater cleanup level.

J = The result is an estimated value because it was greater than the detection limit but less than the LOQ.

B =The analyte was detected in the method blank, trip blank, or equipment blank and the concentration in the sample did not exceed the blank concentration by a factor of 5.

- = Sample was not analyzed/not applicable for contaminant.

[ ] = LOD

Bold = results exceed ADEC cleanup levels.

For microbial results, refer to Microbial Genetic Results Report and associated documents (Attachment F-2).

CAS = Chemical Abstract Services

PQL = practical quantitation limit

TMB = trimethylbenzene

For additional definitions, refer to the Acronyms and Abbreviations section of the report.

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW10	MW10	MW12	MW17
				Sample ID:	20MAW-MW10-GW	20MAW-MW10-GWA	20MAW-MW12-GW	20MAW-MW17-GW
				Lab Sample ID:	1209871003	1209871004	1209876001	1209876003
				SDG:	1209871	1209871	1209876	1209876
				Sample Date/Time:	12/15/2020 15:36	12/15/2020 15:36	12/16/2020 09:45	12/16/2020 14:03
				QA/QC:	Primary Sample	Field Duplicate	Primary Sample	Primary Sample
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**				
-	AK101	µg/L	GRO	2200	**28400 [2500]**	**29000 [2500]**	36.4 [50] J	ND [50]
-	AK102	µg/L	DRO	1500	**14800 [300]**	**14400 [326]**	603 [319] J,B	**3050 [313]**
-	AK103	µg/L	RRO	1100	**1300 [250] B**	**1200 [272] B**	350 [266] J,B	**3620 [261]**
74-82-8	RSKSOP-147/175	µg/L	Methane	-	1820 [2.5]	2390 [2.5]	568 [0.25]	-
14808-79-8	EPA 300.0	µg/L	Sulfate	-	517 [100]	471 [100]	8930 [100]	-
-	SM21 4500NO3-F	µg/L	Total Nitrate/Nitrite-N	-	192 [100] J,B	192 [100] J,B	55 [100] J,B	-
-	SM21 4500P-B,E	µg/L	Total Phosphorus	-	875 [100]	926 [40]	139 [20]	-
7439-89-6	SW6020B	µg/L	Iron	-	123000 [1250]	125000 [1250]	24800 [500]	-
7439-96-5	SW6020B	µg/L	Manganese	430	**5450 [5]**	**5600 [5]**	**2990 [2]**	-
90-12-0	8270D SIM LV (PAH)	µg/L	1-Methylnaphthalene	11	**99.3 [0.481]**	**118 [0.505]**	-	-
91-57-6	8270D SIM LV (PAH)	µg/L	2-Methylnaphthalene	36	**137 [0.481]**	**165 [0.505]**	-	-
83-32-9	8270D SIM LV (PAH)	µg/L	Acenaphthene	530	ND [0.024]	ND [0.0252]	-	-
208-96-8	8270D SIM LV (PAH)	µg/L	Acenaphthylene	260	ND [0.024]	ND [0.0252]	-	-
120-12-7	8270D SIM LV (PAH)	µg/L	Anthracene	43	ND [0.024]	ND [0.0252]	-	-
56-55-3	8270D SIM LV (PAH)	µg/L	Benzo(a)anthracene	0.3	ND [0.024]	ND [0.0252]	-	-
50-32-8	8270D SIM LV (PAH)	µg/L	Benzo(a)pyrene	0.25	ND [0.0096]	ND [0.0101]	-	-
205-99-2	8270D SIM LV (PAH)	µg/L	Benzo(b)fluoranthene	2.5	ND [0.024]	ND [0.0252]	-	-
191-24-2	8270D SIM LV (PAH)	µg/L	Benzo(g,h,i)perylene	0.26	ND [0.024]	ND [0.0252]	-	-
207-08-9	8270D SIM LV (PAH)	µg/L	Benzo(k)fluoranthene	0.8	ND [0.024]	ND [0.0252]	-	-
218-01-9	8270D SIM LV (PAH)	µg/L	Chrysene	2	ND [0.024]	ND [0.0252]	-	-
53-70-3	8270D SIM LV (PAH)	µg/L	Dibenzo(a,h)anthracene	0.25	ND [0.0096]	ND [0.0101]	-	-
206-44-0	8270D SIM LV (PAH)	µg/L	Fluoranthene	260	ND [0.024]	ND [0.0252]	-	-
86-73-7	8270D SIM LV (PAH)	µg/L	Fluorene	290	0.938 [0.024]	0.82 [0.0252]	-	-
193-39-5	8270D SIM LV (PAH)	µg/L	Indeno(1,2,3-cd)pyrene	0.19	ND [0.024]	ND [0.0252]	-	-
91-20-3	8270D SIM LV (PAH)	µg/L	Naphthalene	1.7	**354 [4.81]**	**329 [5.05]**	-	-
85-01-8	8270D SIM LV (PAH)	µg/L	Phenanthrene	170	0.273 [0.024] B	0.255 [0.0252] B	-	-
129-00-0	8270D SIM LV (PAH)	µg/L	Pyrene	120	0.0204 [0.024] J	0.0202 [0.0252] J	-	-
71-43-2	SW8021B	µg/L	Benzene	4.6	-	-	1.7 [0.25]	ND [0.25]
100-41-4	SW8021B	µg/L	Ethylbenzene	15	-	-	0.42 [0.5] J	ND [0.5]
-	SW8021B	µg/L	o-Xylene	-	-	-	1.02 [0.5]	0.33 [0.5] J
-	SW8021B	µg/L	P & M -Xylene	-	-	-	3.69 [1]	0.83 [1] J
108-88-3	SW8021B	µg/L	Toluene	1100	-	-	1.06 [0.5]	0.34 [0.5] J
1330-20-7	SW8021B	µg/L	Xylenes	190	-	-	4.71 [1.5]	1.16 [1.5] J
630-20-6	SW8260D	µg/L	1,1,1,2-Tetrachloroethane	5.7	ND [2.5]	ND [2.5]	-	-
71-55-6	SW8260D	µg/L	1,1,1-Trichloroethane	8000	ND [5]	ND [5]	-	-
79-34-5	SW8260D	µg/L	1,1,2,2-Tetrachloroethane	0.76	ND [2.5] E	ND [2.5] E	-	-
79-00-5	SW8260D	µg/L	1,1,2-Trichloroethane	0.41	ND [2] E	ND [2] E	-	-
75-34-3	SW8260D	µg/L	1,1-Dichloroethane	28	ND [5]	ND [5]	-	-
75-35-4	SW8260D	µg/L	1,1-Dichloroethene	280	ND [5]	ND [5]	-	-
563-58-6	SW8260D	µg/L	1,1-Dichloropropene	-	ND [5]	ND [5]	-	-
96-18-4	SW8260D	µg/L	1,2,3-TCP	0.0075	ND [5] E	ND [5] E	-	-
87-61-6	SW8260D	µg/L	1,2,3-Trichlorobenzene	7	ND [5]	ND [5]	-	-
95-63-6	SW8260D	µg/L	1,2,4-TMB	56	**1640 [5]**	**1650 [5]**	-	-
120-82-1	SW8260D	µg/L	1,2,4-Trichlorobenzene	4	ND [5] E	ND [5] E	-	-
96-12-8	SW8260D	µg/L	1,2-Dibromo-3-chloropropane	-	ND [50]	ND [50]	-	-
95-50-1	SW8260D	µg/L	1,2-Dichlorobenzene	300	ND [5]	ND [5]	-	-

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW10	MW10	MW12	MW17
				Sample ID:	20MAW-MW10-GW	20MAW-MW10-GWA	20MAW-MW12-GW	20MAW-MW17-GW
				Lab Sample ID:	1209871003	1209871004	1209876001	1209876003
				SDG:	1209871	1209871	1209876	1209876
				Sample Date/Time:	12/15/2020 15:36	12/15/2020 15:36	12/16/2020 09:45	12/16/2020 14:03
				QA/QC:	Primary Sample	Field Duplicate	Primary Sample	Primary Sample
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**				
107-06-2	SW8260D	µg/L	1,2-Dichloroethane	1.7	ND [2.5] E	ND [2.5] E	0.378 [0.25] J	ND [0.25]
78-87-5	SW8260D	µg/L	1,2-Dichloropropane	8.2	ND [5]	ND [5]	-	-
108-67-8	SW8260D	µg/L	1,3,5-TMB	60	**424 [5]**	**426 [5]**	-	-
541-73-1	SW8260D	µg/L	1,3-Dichlorobenzene	300	ND [5]	ND [5]	-	-
142-28-9	SW8260D	µg/L	1,3-Dichloropropane	-	ND [2.5]	ND [2.5]	-	-
106-46-7	SW8260D	µg/L	1,4-Dichlorobenzene	4.8	ND [2.5]	ND [2.5]	-	-
594-20-7	SW8260D	µg/L	2,2-Dichloropropane	-	ND [5]	ND [5]	-	-
95-49-8	SW8260D	µg/L	2-Chlorotoluene	-	ND [5]	ND [5]	-	-
591-78-6	SW8260D	µg/L	2-Hexanone	38	ND [50] E	ND [50] E	-	-
106-43-4	SW8260D	µg/L	4-Chlorotoluene	-	ND [5]	ND [5]	-	-
108-10-1	SW8260D	µg/L	4-Methyl-2-Pentanone	6300	ND [50]	ND [50]	-	-
71-43-2	SW8260D	µg/L	Benzene	4.6	**809 [2]**	**824 [2]**	-	-
108-86-1	SW8260D	µg/L	Bromobenzene	62	ND [5]	ND [5]	-	-
74-97-5	SW8260D	µg/L	Bromochloromethane	-	ND [5]	ND [5]	-	-
75-27-4	SW8260D	µg/L	Bromodichloromethane	1.3	ND [2.5] E	ND [2.5] E	-	-
75-25-2	SW8260D	µg/L	Bromoform	33	ND [5]	ND [5]	-	-
74-83-9	SW8260D	µg/L	Bromomethane	7.5	ND [25] E	ND [25] E	-	-
75-15-0	SW8260D	µg/L	Carbon Disulfide	810	ND [50]	ND [50]	-	-
56-23-5	SW8260D	µg/L	Carbon Tetrachloride	4.6	ND [5] E	ND [5] E	-	-
108-90-7	SW8260D	µg/L	Chlorobenzene	78	ND [2.5]	ND [2.5]	-	-
75-00-3	SW8260D	µg/L	Chloroethane	21000	ND [5]	ND [5]	-	-
67-66-3	SW8260D	µg/L	Chloroform	2.2	ND [5] E	ND [5] E	-	-
74-87-3	SW8260D	µg/L	Chloromethane	190	ND [5]	ND [5]	-	-
542-75-6	SW8260D	µg/L	cis-1,3-Dichloropropene	4.7	ND [2.5]	ND [2.5]	-	-
156-59-2	SW8260D	µg/L	cis-DCE	36	ND [5]	ND [5]	-	-
98-82-8	SW8260D	µg/L	Cumene	450	83.7 [5]	83.2 [5]	-	-
124-48-1	SW8260D	µg/L	Dibromochloromethane	8.7	ND [2.5]	ND [2.5]	-	-
74-95-3	SW8260D	µg/L	Dibromomethane	8.3	ND [5]	ND [5]	-	-
106-93-4	SW8260D	µg/L	EDB	0.075	**4.22 [0.375]**	**4.51 [0.375]**	-	-
100-41-4	SW8260D	µg/L	Ethylbenzene	15	**941 [5]**	**947 [5]**	-	-
75-69-4	SW8260D	µg/L	Freon-11	5200	ND [5]	ND [5]	-	-
76-13-1	SW8260D	µg/L	Freon-113	10000	ND [50]	ND [50]	-	-
75-71-8	SW8260D	µg/L	Freon-12	200	ND [5]	ND [5]	-	-
87-68-3	SW8260D	µg/L	Hexachlorobutadiene	1.4	ND [5] E	ND [5] E	-	-
78-93-3	SW8260D	µg/L	MEK	5600	ND [50]	ND [50]	-	-
75-09-2	SW8260D	µg/L	Methylene Chloride	110	ND [50]	ND [50]	-	-
1634-04-4	SW8260D	µg/L	Methyl-t-butyl ether	140	ND [50]	ND [50]	-	-
91-20-3	SW8260D	µg/L	Naphthalene	1.7	**454 [5]**	**463 [5]**	-	-
104-51-8	SW8260D	µg/L	n-Butylbenzene	1000	ND [5]	ND [5]	-	-
-	SW8260D	µg/L	o-Xylene	-	2250 [25]	2280 [25]	-	-
-	SW8260D	µg/L	P & M -Xylene	-	5840 [50]	5920 [50]	-	-
127-18-4	SW8260D	µg/L	PCE	41	ND [5]	ND [5]	-	-
99-87-6	SW8260D	µg/L	p-Cymene	-	12.2 [5]	12.4 [5]	-	-
103-65-1	SW8260D	µg/L	Propylbenzene	660	146 [5]	145 [5]	-	-
135-98-8	SW8260D	µg/L	sec-Butylbenzene	2000	18.7 [5]	19.6 [5]	-	-
100-42-5	SW8260D	µg/L	Styrene	1200	ND [5]	ND [5]	-	-

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW10	MW10	MW12	MW17
				Sample ID:	20MAW-MW10-GW	20MAW-MW10-GWA	20MAW-MW12-GW	20MAW-MW17-GW
				Lab Sample ID:	1209871003	1209871004	1209876001	1209876003
				SDG:	1209871	1209871	1209876	1209876
				Sample Date/Time:	12/15/2020 15:36	12/15/2020 15:36	12/16/2020 09:45	12/16/2020 14:03
				QA/QC:	Primary Sample	Field Duplicate	Primary Sample	Primary Sample
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**				
79-01-6	SW8260D	µg/L	TCE	2.8	ND [5] E	ND [5] E	-	-
98-06-6	SW8260D	µg/L	tert-Butylbenzene	690	6.15 [5] J	6.18 [5] J	-	-
108-88-3	SW8260D	µg/L	Toluene	1100	**4940 [25]**	**4960 [25]**	-	-
542-75-6	SW8260D	µg/L	trans-1,3-Dichloropropene	4.7	ND [5] E	ND [5] E	-	-
156-60-5	SW8260D	µg/L	trans-DCE	360	ND [5]	ND [5]	-	-
75-01-4	SW8260D	µg/L	Vinyl Chloride	0.19	ND [0.75] E	ND [0.75] E	-	-
108-05-4	SW8260D	µg/L	Vinyl Acetate	410	ND [50]	ND [50]	-	-
1330-20-7	SW8260D	µg/L	Xylenes	190	**8090 [75]**	**8200 [75]**	-	-
106-93-4	SW8260D-SIM	µg/L	EDB	0.075	**3.8 [0.025]**	**3.89 [0.025]**	ND [0.0025]	ND [0.0025]

Notes:

[A] ADEC Groundwater Cleanup Levels, Table C (ADEC 2020b).

E = The result was nondetect and the LOD exceeds the groundwater cleanup level.

J = The result is an estimated value because it was greater than the detection limit but less than the LOQ.

B =The analyte was detected in the method blank, trip blank, or equipment blank and the concentration in the sample did not exceed the blank concentration by a factor of 5.

- = Sample was not analyzed/not applicable for contaminant.

[ ] = LOD

Bold = results exceed ADEC cleanup levels.

For microbial results, refer to Microbial Genetic Results Report and associated documents (Attachment F-2).

CAS = Chemical Abstract Services

PQL = practical quantitation limit

TMB = trimethylbenzene

For additional definitions, refer to the Acronyms and Abbreviations section of the report.

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW17	MAW/BFS-EB	MAW-TB01	MAW-TB02	MAW-TB01
				Sample ID:	20MAW-MW17-GWA	20MAW/BFS-EB	20MAW-TB01	20MAW-TB02	20MAW/BFS-TB01
				Lab Sample ID:	1209876004	1209879005	1209871005	1209876006	1209879006
				SDG:	1209876	1209879	1209871	1209876	1209879
				Sample Date/Time:	12/16/2020 14:03	12/18/2020 15:30	12/15/2020 08:00	12/16/2020 08:00	12/17/2020 08:00
				QA/QC:	Field Duplicate	Equipment Blank	Trip Blank	Trip Blank	Trip Blank
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**					
-	AK101	µg/L	GRO	2200	-	ND [50]	ND [50]	ND [50]	ND [50]
-	AK102	µg/L	DRO	1500	-	417 [326] J	-	-	-
-	AK103	µg/L	RRO	1100	-	325 [272] J	-	-	-
74-82-8	RSKSOP-147/175	µg/L	Methane	-	-	0.22 [0.25]	-	-	-
14808-79-8	EPA 300.0	µg/L	Sulfate	-	-	ND [100]	-	-	-
-	SM21 4500NO3-F	µg/L	Total Nitrate/Nitrite-N	-	-	-	-	-	-
-	SM21 4500P-B,E	µg/L	Total Phosphorus	-	-	-	-	-	-
7439-89-6	SW6020B	µg/L	Iron	-	-	ND [250]	-	-	-
7439-96-5	SW6020B	µg/L	Manganese	430	-	0.761 [1] J,JL+	-	-	-
90-12-0	8270D SIM LV (PAH)	µg/L	1-Methylnaphthalene	11	-	0.0319 [0.0284] J	-	-	-
91-57-6	8270D SIM LV (PAH)	µg/L	2-Methylnaphthalene	36	-	0.0415 [0.0284] J	-	-	-
83-32-9	8270D SIM LV (PAH)	µg/L	Acenaphthene	530	-	ND [0.0284]	-	-	-
208-96-8	8270D SIM LV (PAH)	µg/L	Acenaphthylene	260	-	ND [0.0284]	-	-	-
120-12-7	8270D SIM LV (PAH)	µg/L	Anthracene	43	-	ND [0.0284]	-	-	-
56-55-3	8270D SIM LV (PAH)	µg/L	Benzo(a)anthracene	0.3	-	ND [0.0284]	-	-	-
50-32-8	8270D SIM LV (PAH)	µg/L	Benzo(a)pyrene	0.25	-	ND [0.0114]	-	-	-
205-99-2	8270D SIM LV (PAH)	µg/L	Benzo(b)fluoranthene	2.5	-	ND [0.0284]	-	-	-
191-24-2	8270D SIM LV (PAH)	µg/L	Benzo(g,h,i)perylene	0.26	-	ND [0.0284]	-	-	-
207-08-9	8270D SIM LV (PAH)	µg/L	Benzo(k)fluoranthene	0.8	-	ND [0.0284]	-	-	-
218-01-9	8270D SIM LV (PAH)	µg/L	Chrysene	2	-	ND [0.0284]	-	-	-
53-70-3	8270D SIM LV (PAH)	µg/L	Dibenzo(a,h)anthracene	0.25	-	ND [0.0114]	-	-	-
206-44-0	8270D SIM LV (PAH)	µg/L	Fluoranthene	260	-	ND [0.0284]	-	-	-
86-73-7	8270D SIM LV (PAH)	µg/L	Fluorene	290	-	ND [0.0284]	-	-	-
193-39-5	8270D SIM LV (PAH)	µg/L	Indeno(1,2,3-cd)pyrene	0.19	-	ND [0.0284]	-	-	-
91-20-3	8270D SIM LV (PAH)	µg/L	Naphthalene	1.7	-	ND [0.057]	-	-	-
85-01-8	8270D SIM LV (PAH)	µg/L	Phenanthrene	170	-	0.0693 [0.0284]	-	-	-
129-00-0	8270D SIM LV (PAH)	µg/L	Pyrene	120	-	ND [0.0284]	-	-	-
71-43-2	SW8021B	µg/L	Benzene	4.6	ND [0.25]	-	-	ND [0.25]	-
100-41-4	SW8021B	µg/L	Ethylbenzene	15	ND [0.5]	-	-	ND [0.5]	-
-	SW8021B	µg/L	o-Xylene	-	0.32 [0.5] J	-	-	ND [0.5]	-
-	SW8021B	µg/L	P & M -Xylene	-	0.76 [1] J	-	-	ND [1]	-
108-88-3	SW8021B	µg/L	Toluene	1100	0.34 [0.5] J	-	-	ND [0.5]	-
1330-20-7	SW8021B	µg/L	Xylenes	190	1.08 [1.5] J	-	-	ND [1.5]	-
630-20-6	SW8260D	µg/L	1,1,1,2-Tetrachloroethane	5.7	-	ND [0.25]	ND [0.25]	-	ND [0.25]
71-55-6	SW8260D	µg/L	1,1,1-Trichloroethane	8000	-	ND [0.5]	ND [0.5]	-	ND [0.5]
79-34-5	SW8260D	µg/L	1,1,2,2-Tetrachloroethane	0.76	-	ND [0.25]	ND [0.25]	-	ND [0.25]
79-00-5	SW8260D	µg/L	1,1,2-Trichloroethane	0.41	-	ND [0.2]	ND [0.2]	-	ND [0.2]
75-34-3	SW8260D	µg/L	1,1-Dichloroethane	28	-	ND [0.5]	ND [0.5]	-	ND [0.5]
75-35-4	SW8260D	µg/L	1,1-Dichloroethene	280	-	ND [0.5]	ND [0.5]	-	ND [0.5]
563-58-6	SW8260D	µg/L	1,1-Dichloropropene	-	-	ND [0.5]	ND [0.5]	-	ND [0.5]
96-18-4	SW8260D	µg/L	1,2,3-TCP	0.0075	-	ND [0.5] E	ND [0.5] E	-	ND [0.5] E
87-61-6	SW8260D	µg/L	1,2,3-Trichlorobenzene	7	-	ND [0.5]	ND [0.5]	-	ND [0.5]
95-63-6	SW8260D	µg/L	1,2,4-TMB	56	-	ND [0.5]	ND [0.5]	-	ND [0.5]
120-82-1	SW8260D	µg/L	1,2,4-Trichlorobenzene	4	-	ND [0.5]	ND [0.5]	-	ND [0.5]
96-12-8	SW8260D	µg/L	1,2-Dibromo-3-chloropropane	-	-	ND [5]	ND [5]	-	ND [5]
95-50-1	SW8260D	µg/L	1,2-Dichlorobenzene	300	-	ND [0.5]	ND [0.5]	-	ND [0.5]

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW17	MAW/BFS-EB	MAW-TB01	MAW-TB02	MAW-TB01
				Sample ID:	20MAW-MW17-GWA	20MAW/BFS-EB	20MAW-TB01	20MAW-TB02	20MAW/BFS-TB01
				Lab Sample ID:	1209876004	1209879005	1209871005	1209876006	1209879006
				SDG:	1209876	1209879	1209871	1209876	1209879
				Sample Date/Time:	12/16/2020 14:03	12/18/2020 15:30	12/15/2020 08:00	12/16/2020 08:00	12/17/2020 08:00
				QA/QC:	Field Duplicate	Equipment Blank	Trip Blank	Trip Blank	Trip Blank
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**					
107-06-2	SW8260D	µg/L	1,2-Dichloroethane	1.7	-	ND [0.25]	ND [0.25]	ND [0.25]	ND [0.25]
78-87-5	SW8260D	µg/L	1,2-Dichloropropane	8.2	-	ND [0.5]	ND [0.5]	-	ND [0.5]
108-67-8	SW8260D	µg/L	1,3,5-TMB	60	-	ND [0.5]	ND [0.5]	-	ND [0.5]
541-73-1	SW8260D	µg/L	1,3-Dichlorobenzene	300	-	ND [0.5]	ND [0.5]	-	ND [0.5]
142-28-9	SW8260D	µg/L	1,3-Dichloropropane	-	-	ND [0.25]	ND [0.25]	-	ND [0.25]
106-46-7	SW8260D	µg/L	1,4-Dichlorobenzene	4.8	-	ND [0.25]	ND [0.25]	-	ND [0.25]
594-20-7	SW8260D	µg/L	2,2-Dichloropropane	-	-	ND [0.5]	ND [0.5]	-	ND [0.5]
95-49-8	SW8260D	µg/L	2-Chlorotoluene	-	-	ND [0.5]	ND [0.5]	-	ND [0.5]
591-78-6	SW8260D	µg/L	2-Hexanone	38	-	ND [5]	ND [5]	-	ND [5]
106-43-4	SW8260D	µg/L	4-Chlorotoluene	-	-	ND [0.5]	ND [0.5]	-	ND [0.5]
108-10-1	SW8260D	µg/L	4-Methyl-2-Pentanone	6300	-	ND [5]	ND [5]	-	ND [5]
71-43-2	SW8260D	µg/L	Benzene	4.6	-	ND [0.2]	ND [0.2]	-	ND [0.2]
108-86-1	SW8260D	µg/L	Bromobenzene	62	-	ND [0.5]	ND [0.5]	-	ND [0.5]
74-97-5	SW8260D	µg/L	Bromochloromethane	-	-	ND [0.5]	ND [0.5]	-	ND [0.5]
75-27-4	SW8260D	µg/L	Bromodichloromethane	1.3	-	ND [0.25]	ND [0.25]	-	ND [0.25]
75-25-2	SW8260D	µg/L	Bromoform	33	-	ND [0.5]	ND [0.5]	-	ND [0.5]
74-83-9	SW8260D	µg/L	Bromomethane	7.5	-	ND [2.5]	ND [2.5]	-	ND [2.5]
75-15-0	SW8260D	µg/L	Carbon Disulfide	810	-	ND [5]	ND [5]	-	ND [5]
56-23-5	SW8260D	µg/L	Carbon Tetrachloride	4.6	-	ND [0.5]	ND [0.5]	-	ND [0.5]
108-90-7	SW8260D	µg/L	Chlorobenzene	78	-	ND [0.25]	ND [0.25]	-	ND [0.25]
75-00-3	SW8260D	µg/L	Chloroethane	21000	-	ND [0.5]	ND [0.5]	-	ND [0.5]
67-66-3	SW8260D	µg/L	Chloroform	2.2	-	ND [0.5]	ND [0.5]	-	ND [0.5]
74-87-3	SW8260D	µg/L	Chloromethane	190	-	ND [0.5]	ND [0.5]	-	ND [0.5]
542-75-6	SW8260D	µg/L	cis-1,3-Dichloropropene	4.7	-	ND [0.25]	ND [0.25]	-	ND [0.25]
156-59-2	SW8260D	µg/L	cis-DCE	36	-	ND [0.5]	ND [0.5]	-	ND [0.5]
98-82-8	SW8260D	µg/L	Cumene	450	-	ND [0.5]	ND [0.5]	-	ND [0.5]
124-48-1	SW8260D	µg/L	Dibromochloromethane	8.7	-	ND [0.25]	ND [0.25]	-	ND [0.25]
74-95-3	SW8260D	µg/L	Dibromomethane	8.3	-	ND [0.5]	ND [0.5]	-	ND [0.5]
106-93-4	SW8260D	µg/L	EDB	0.075	-	ND [0.0375]	ND [0.0375]	-	ND [0.0375]
100-41-4	SW8260D	µg/L	Ethylbenzene	15	-	ND [0.5]	ND [0.5]	-	ND [0.5]
75-69-4	SW8260D	µg/L	Freon-11	5200	-	ND [0.5]	ND [0.5]	-	ND [0.5]
76-13-1	SW8260D	µg/L	Freon-113	10000	-	ND [5]	ND [5]	-	ND [5]
75-71-8	SW8260D	µg/L	Freon-12	200	-	ND [0.5]	ND [0.5]	-	ND [0.5]
87-68-3	SW8260D	µg/L	Hexachlorobutadiene	1.4	-	ND [0.5]	ND [0.5]	-	ND [0.5]
78-93-3	SW8260D	µg/L	MEK	5600	-	ND [5]	ND [5]	-	ND [5]
75-09-2	SW8260D	µg/L	Methylene Chloride	110	-	ND [5]	ND [5]	-	ND [5]
1634-04-4	SW8260D	µg/L	Methyl-t-butyl ether	140	-	ND [5]	ND [5]	-	ND [5]
91-20-3	SW8260D	µg/L	Naphthalene	1.7	-	ND [0.5]	ND [0.5]	-	ND [0.5]
104-51-8	SW8260D	µg/L	n-Butylbenzene	1000	-	ND [0.5]	ND [0.5]	-	ND [0.5]
-	SW8260D	µg/L	o-Xylene	-	-	ND [0.5]	ND [0.5]	-	ND [0.5]
-	SW8260D	µg/L	P & M -Xylene	-	-	ND [1]	ND [1]	-	ND [1]
127-18-4	SW8260D	µg/L	PCE	41	-	ND [0.5]	ND [0.5]	-	ND [0.5]
99-87-6	SW8260D	µg/L	p-Cymene	-	-	ND [0.5]	ND [0.5]	-	ND [0.5]
103-65-1	SW8260D	µg/L	Propylbenzene	660	-	ND [0.5]	ND [0.5]	-	ND [0.5]
135-98-8	SW8260D	µg/L	sec-Butylbenzene	2000	-	ND [0.5]	ND [0.5]	-	ND [0.5]
100-42-5	SW8260D	µg/L	Styrene	1200	-	ND [0.5]	ND [0.5]	-	ND [0.5]

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-1.2 - 2020 MarkAir Warehouse Groundwater Monitoring Sample Results

				Location ID:	MW17	MAW/BFS-EB	MAW-TB01	MAW-TB02	MAW-TB01
				Sample ID:	20MAW-MW17-GWA	20MAW/BFS-EB	20MAW-TB01	20MAW-TB02	20MAW/BFS-TB01
				Lab Sample ID:	1209876004	1209879005	1209871005	1209876006	1209879006
				SDG:	1209876	1209879	1209871	1209876	1209879
				Sample Date/Time:	12/16/2020 14:03	12/18/2020 15:30	12/15/2020 08:00	12/16/2020 08:00	12/17/2020 08:00
				QA/QC:	Field Duplicate	Equipment Blank	Trip Blank	Trip Blank	Trip Blank
CAS #	**Method**	**Units**	**Analyte**	**GCL[1]**					
79-01-6	SW8260D	µg/L	TCE	2.8	-	ND [0.5]	ND [0.5]	-	ND [0.5]
98-06-6	SW8260D	µg/L	tert-Butylbenzene	690	-	ND [0.5]	ND [0.5]	-	ND [0.5]
108-88-3	SW8260D	µg/L	Toluene	1100	-	ND [0.5]	ND [0.5]	-	ND [0.5]
542-75-6	SW8260D	µg/L	trans-1,3-Dichloropropene	4.7	-	ND [0.5]	ND [0.5]	-	ND [0.5]
156-60-5	SW8260D	µg/L	trans-DCE	360	-	ND [0.5]	ND [0.5]	-	ND [0.5]
75-01-4	SW8260D	µg/L	Vinyl Chloride	0.19	-	ND [0.075]	ND [0.075]	-	ND [0.075]
108-05-4	SW8260D	µg/L	Vinyl Acetate	410	-	ND [5]	ND [5]	-	ND [5]
1330-20-7	SW8260D	µg/L	Xylenes	190	-	ND [1.5]	ND [1.5]	-	ND [1.5]
106-93-4	SW8260D-SIM	µg/L	EDB	0.075	-	ND [0.0025]	ND [0.0025]	ND [0.0025]	ND [0.0025]

Notes:

[A] ADEC Groundwater Cleanup Levels, Table C (ADEC 2020b).

E = The result was nondetect and the LOD exceeds the groundwater cleanup level.

J = The result is an estimated value because it was greater than the detection limit but less than the LOQ.

B =The analyte was detected in the method blank, trip blank, or equipment blank and the concentration in the sample did not exceed the blank concentration by a factor of 5.

- = Sample was not analyzed/not applicable for contaminant.

[ ] = LOD

Bold = results exceed ADEC cleanup levels.

For microbial results, refer to Microbial Genetic Results Report and associated documents (Attachment F-2).

CAS = Chemical Abstract Services

PQL = practical quantitation limit

TMB = trimethylbenzene

For additional definitions, refer to the Acronyms and Abbreviations section of the report.

Laboratory Data Review Checklist

Completed By:

Kari Hagen

Title:

Chemist

Date:

2/01/2021

Consultant Firm:

Jacobs

Laboratory Name:

SGS

Laboratory Report Number:

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

ADEC File Number:

100.26.043

Hazard Identification Number:

22871

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

Samples were submitted to SGS of Anchorage, AK.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☒ No☐ N/A☐ Comments:

SGS of Orlando, FL performed the method RSK175 methane.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

SGS Fairbanks temperature: 2.0°C
SGS Anchorage temperature: 1.4°C
SGS Orlando temperature (RSK175 methane): 5.0°C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

No discrepancies were noted on the cooler receipt form.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies were noted on the cooler receipt form.

e. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

QC failures are discussed in the relevant sections of this checklist.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

Corrective actions were not necessary.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The data quality and usability were not affected.

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

Soil samples were not submitted with this project.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☐ No☒ N/A☐ Comments:

The following samples/analytes had LODs greater than the project screening level (PSL).

SW8260D –
20MAW-MW10-GW and 20MAW-MW10-GWA: 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,2,3-TCP, 1,2,4-Trichlorobenzene, 1,2-Dichloroethane, 2-Hexanone, Bromodichloromethane, Bromomethane, Carbon Tetrachloride, Chloroform, Hexachlorobutadiene, TCE, trans-1,3-Dichloropropene and VC.

20MAW-MW8-GW: 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,2,3-TCP, Bromomethane, Chloroform, EDB, Hexachlorobutadiene and VC.

20MAW-TB01: 1,2,3-TCP

e. Data quality or usability affected?

Data quality was affected in that results exceeding the PSL may be reported as nondetect (ND) due to sample dilutions or laboratory method limitations. Except EDB, affected results were not contaminants of concern at this site. EDB was analyzed by method SW8260D SIM and the LOD met the PSL. Nondetect results with LODs greater than the PSL are qualified E.

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

All detections in the method blank were less than the LOQ; however, all sample results associated with a method blank detection were reviewed.

SM21 4500NO3-F–
Total Nitrate/Nitrite-N was detected in the method blank (50.2 ug/L).

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

SM21 4500NO3-F–
Total Nitrate/Nitrite-N was detected in the method blank affecting samples 20MAW-MW8-GW, 20MAW-MW10-GW and 20MAW-MW10-GWA.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Affected results were qualified B to indicate the result may be biased high.

v. Data quality or usability affected?

Comments:

The results are usable, but may be biased high.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No samples were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and usability were not affected.

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

Associated sample results are only qualified if the dilution factor is less than five and the matrix spike concentration is at least two times the sample concentration.

SM21 4500P-B,E: Phosphorus was recovered high in the MSD in sample 20MAW-MW5-GW. The affected sample concentration was greater than the spike concentration; therefore, the result was not affected or qualified.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☒ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No samples were affected.

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and usability were not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes☒ No☐ N/A☐ Comments:

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

iv. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ Comments:

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☒ No☐ N/A☐ Comments:

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

All TB results were nondetect.

v. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

One field duplicate was submitted with 7 primary samples.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The following field duplicate was submitted with this SDG:
Primary/Field Duplicate Sample ID:
20MAW-MW10-GW/20MAW-MW10-GWA

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☒ N/A☐ Comments:

RPDs were only evaluated if at least one result in the duplicate pair was greater than the LOD. If one result was non-detect, the LOD value was used to calculate the RPD.

All Primary/Field Duplicate RPDs were less than 30 percent.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and usability were not affected.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☒ No☐ N/A☐ Comments:

One equipment blank (EB), MAW/BFS-EB was submitted.

i. All results less than LOQ and project specified objectives?

Yes☐ No☒ N/A☐ Comments:

All results were less than the LOQ except phenanthrene, however all detections in the EB were evaluated.

The following analytes were detected in the EB, 20MAW/BFS-EB:

AK102-DRO
AK103-RRO
8270D SIM-1-Methylnaphthalene**,** 2-Methylnaphthalene and Phenanthrene
SW6020B-Manganese

1209871

Laboratory Report Date:

1/12/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

The following sample results were qualified B if the sample result was less than five times the EB result:

AK102 DRO - 20MAW-MW3-GW, 20MAW-MW8-GW
AK103 RRO - 20MAW-MW3-GW, 20MAW-MW8-GW, 20MAW-MW10-GW, 20MAW-MW10-GWA
8270D SIM Phenanthrene - 20MAW-MW8-GW, 20MAW-MW10-GW, 20MAW-MW10-GWA

iii. Data quality or usability affected?

Comments:

Samples 20MAW-MW10-GW, 20MAW-MW10-GWA were qualified B for RRO due to detections in the EB. The sample results were slightly greater than the screening level and may be biased high.

All other results qualified B (RRO and phenanthrene) were less than the PSL; therefore, the data quality and usability were minimally affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

Laboratory Data Review Checklist

Completed By:

Kari Hagen

Title:

Chemist

Date:

2/01/2021

Consultant Firm:

Jacobs

Laboratory Name:

SGS

Laboratory Report Number:

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

ADEC File Number:

100.26.043

Hazard Identification Number:

22871

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

Samples were submitted to SGS of Anchorage, AK.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☒ No☐ N/A☐ Comments:

SGS of Orlando, FL performed the method RSK175 methane.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

SGS Fairbanks temperature: 2.8°C
SGS Anchorage temperature: 4.3°C
SGS Orlando temperature: 5.2°C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

No discrepancies were noted on the cooler receipt form.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies were noted on the cooler receipt form.

e. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

QC failures are discussed in the relevant sections of this checklist.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

Corrective actions were not necessary.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The data quality and usability were not affected.

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

Soil samples were not submitted with this project.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

e. Data quality or usability affected?

The data quality and usability were not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

All detections in the method blank were less than the LOQ; however, all sample results associated with a method blank detection were reviewed.

SM21 4500NO3-F–
Total Nitrate/Nitrite-N was detected in the method blank (50.2 ug/L).

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

SM21 4500NO3-F–
Total Nitrate/Nitrite-N was detected in the method blank affecting sample 20MAW-MW12-GW.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Affected results were qualified B to indicate the result may be biased high.

v. Data quality or usability affected?

Comments:

The results are usable, but may be biased high.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No samples were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and usability were not affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☒ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

Associated sample results are only evaluated and qualified if the dilution factor is less than five and the matrix spike concentration is at least two times the sample concentration.

SM21 4500P-B,E: Phosphorus was recovered high in the MS and MSD of sample 20MAW-MW5-GW. The affected sample concentration was greater than the spike concentration; therefore the results were not affected or qualified.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No samples were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and usability were not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes☒ No☐ N/A☐ Comments:

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

iv. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☒ No☐ N/A☐ Comments:

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

All TB results were nondetect.

v. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

One field duplicate was submitted with this SDG for method SW8021 BTEX only.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The following field duplicate was submitted with this SDG:
Primary/Field Duplicate Sample ID:
20MAW-MW17-GW/ 20MAW-MW17-GWA

iii. Precision – All relative percent differences (RPD) less than specified project objectives?
(Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☒ N/A☐ Comments:

RPDs were only evaluated if at least one result in the duplicate pair was greater than the LOD. If one result was non-detect, the LOD value was used to calculate the RPD.

All Primary/Field Duplicate RPDs were less than 30 percent.

1209876

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and usability were not affected.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☒ No☐ N/A☐ Comments:

One equipment blank (EB), MAW/BFS-EB was submitted.

i. All results less than LOQ and project specified objectives?

Yes☐ No☒ N/A☐ Comments:

All results were less than the LOQ, however all detections in the EB were evaluated.

The following analytes were detected in the EB, 20MAW/BFS-EB:

AK102-DRO
AK103-RRO

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

The following sample results were qualified B if the sample result was less than five times the EB result:

AK102 DRO - 20MAW-MW5-GW, 20MAW-MW9-GW, 20MAW-MW17-GW
AK103 RRO - 20MAW-MW5-GW, 20MAW-MW9-GW, 20MAW-MW17-GW

iii. Data quality or usability affected?

Comments:

All affected results qualified B were less than the screening level; therefore the data quality and usability were minimally affected.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

Laboratory Data Review Checklist

Completed By:

Kari Hagen

Title:

Chemist

Date:

2/01/2021

Consultant Firm:

Jacobs

Laboratory Name:

SGS

Laboratory Report Number:

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

ADEC File Number:

100.38.279

Hazard Identification Number:

26870

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

Samples were submitted to SGS of Anchorage, AK.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☒ No☐ N/A☐ Comments:

SGS of Orlando, FL performed the method RSK175 methane.

2. Chain of Custody (CoC)

   a. CoC information completed, signed, and dated (including released/received by)?

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

SGS Fairbanks temperature: 4.1°C
SGS Anchorage temperature: 3.3°C
SGS Orlando temperature: 2.2°C

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

No discrepancies were noted on the cooler receipt form.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes☐ No☐ N/A☒ Comments:

No discrepancies were noted on the cooler receipt form.

e. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

QC failures are discussed in the relevant sections of this checklist.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

Corrective actions were not necessary.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The data quality and usability were not affected.

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

Soil samples were not submitted with this project.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☐ No☒ N/A☐ Comments:

The following analyte/samples had LODs greater than the project screening level (PSL).

SW8260D – 1,2,3-TCP:
20MAW/BFS-EB and 20MAW/BFS-TB01

e. Data quality or usability affected?

Data results exceeding the PSL may be reported as nondetect (ND) due to sample dilutions or laboratory method limitations. 1,2,3-TCP was not a contaminant of concern at this site; therefore, the data quality or usability were minimally affected. ND results with LODs greater than the PSL are qualified E.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No samples were affected.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

v. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

The following recoveries were outside of lab criteria:

LCS/LCSD %R:
SW6020B – Iron and manganese were recovered high in the LCS.

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

LCS/LCSD %R:
SW6020B – Iron and manganese were recovered high in the LCS. All associated iron results were ND and not affected. The manganese result was affected in the equipment blank sample, 20MAW/BFS-EB.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

LCS/LCSD %R:
SW6020B –The manganese result in sample 20MAW/BFS-EB was qualified JL+ to indicate the result may be biased high.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

LCS/LCSD %R:
SW6020B –The manganese result in sample 20MAW/BFS-EB was less than the PSL; therefore, data quality or usability were minimally affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

MS/MSDs were not required for this project.

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

MS/MSDs were not required for this project however, they were included in the analytical batches as the methods required. MS/MSDs were only evaluated if they were performed on samples from this project.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

Associated sample results are only qualified if the dilution factor is less than five and the matrix spike concentration is at least two times the sample concentration.

SW6020B: Iron and manganese were recovered high in the MS and/or MSD in sample 20MAW/BFS-EB. The affected sample had a dilution factor of 5 or greater; therefore, the results were not affected. According to the case narrative, a post digestion spike was successful.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

No samples were affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and usability were not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes☒ No☐ N/A☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes☒ No☐ N/A☐ Comments:

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

No samples were affected.

iv. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ Comments:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☒ No☐ N/A☐ Comments:

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

All TB results were ND.

v. Data quality or usability affected?

Comments:

The data quality and usability were not affected.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

The field duplicate frequency of 10 percent was met for the project. A field duplicate was not submitted with this sample delivery group (SDG).

ii. Submitted blind to lab?

Yes☒ No☐ N/A☒ Comments:

A field duplicate was not submitted with this SDG.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = Absolute value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☐ No☐ N/A☒ Comments:

A field duplicate was not submitted with this SDG.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality or usability were not affected.

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☒ No☐ N/A☐ Comments:

One equipment blank (EB), 20MAW/BFS-EB was submitted. Because the same sampling equipment was used at two separate sites (Brooks Fuel and MarkAir Warehouse), only one EB was submitted and shared between the two sites. Only affected samples from the MarkAir Warehouse site are evaluated in this checklist.

i. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

All results were less than the LOQ, however all detections in the EB were evaluated.

The following analytes were detected in the EB, 20MAW/BFS-EB:
AK102 - DRO
AK103 - RRO
SW8270D SIM - 1-methylnaphthalene, 2-methylnaphthalene and phenanthrene
SW6020B - manganese
RSKSOP-147/175 - methane

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

The following sample results were qualified B if the sample result was less than five times the EB result:

AK102 DRO - 20MAW-MW3-GW, MAW-MW5-GW, MAW-MW8-GW and MAW-MW9-GW.
AK103 RRO - 20MAW-MW3-GW, MAW-MW5-GW, MAW-MW8-GW, MAW-MW9-GW, MAW-MW10-GW, MAW-MW10-GWA and MAW-MW12-GW.
SW8270D SIM Phenanthrene - MAW-MW8-GW, MAW-MW10-GW and MAW-MW10-GWA.

iii. Data quality or usability affected?

Comments:

Samples MAW-MW10-GW and MAW-MW10-GWA were qualified B for RRO due to detections in the EB. The sample results were slightly greater than the PSL and may be biased high.

All other results qualified B were less than the PSL; therefore, the data quality and usability were minimally affected.

1209879

Laboratory Report Date:

1/13/2021

CS Site Name:

2020 ADOT MarkAir Warehouse Groundwater Monitoring (Equipment Blank Only)

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☒ No☐ N/A☐ Comments:

Laboratory Report of Analysis

To: Jacobs Technology Inc.
794 University Ave #201
Fairbanks, AK 99709

Report Number: **1209871**

Client Project: **MarkAir GW Monitoring**

Dear Kari Hagen,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
2021.01.12
16:52:09 -09'00'

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

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Case Narrative

SGS Client: **Jacobs Technology Inc.**
SGS Project: **1209871**
Project Name/Site: **MarkAir GW Monitoring**
Project Contact: **Kari Hagen**

Refer to sample receipt form for information on sample condition.

20MAW-MW8-GW (1209871001) PS

Light Gases by RSK 175 (Methane only) were analyzed by SGS of Orlando, FL.
8260D SIM - The LOQs were elevated due to a high concentration of non-target compounds.

LCSD for HBN 1814939 [XXX/4432 (1596120) LCSD

8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene-d10 biased high.

MB for HBN 1814939 [XXX/44324] (1596118) MB

8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene-d10 biased high.

1206643001MS (1596227) MS

4500NO3-F - Nitrate/Nitrite - MS recovery for Total Nitrite / Nitrate is outside of QC criteria. Refer to LCS for accuracy requirements.

1206703002MS (1596229) MS

4500NO3-F - Nitrate/Nitrite - MS recovery for Total Nitrite / Nitrate is outside of QC criteria. Refer to LCS for accuracy requirements.

1206643001MSD (1596228) MSD

4500NO3-F - Nitrate/Nitrite - MSD recovery for Total Nitrite / Nitrate is outside of QC criteria. Refer to LCS for accuracy requirements.

1206703002MSD (1596230) MSD

4500NO3-F - Nitrate/Nitrite - MSD recovery for Total Nitrite / Nitrate is outside of QC criteria. Refer to LCS for accuracy requirements.

1209876005MSD (1596476) MSD

4500P-B,E - Total Phosphorus - MSD recovery is outside of QC criteria. Refer to LCS for accuracy requirements.
4500P-B,E - Total Phosphorus - MS/MSD RPD was outside of QC criteria. Refer to LCS/LCSD for precision requirement.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8260D				
1209871003	20MAW-MW10-GW	VMS20529	4-Isopropyltoluene	SP
1209871004	20MAW-MW10-GWA	VMS20529	4-Isopropyltoluene	SP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Print Date: 01/11/2021 3:42:29PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 DW Chemistry & Microbiology (Provisionally Certified as of 12/03/2020 for Turbidity by SM2130B, Copper & Mercury by EPA200.8 and Trihalomethanes by EPA 524.2) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
20MAW-MW8-GW	1209871001	12/15/2020	12/17/2020	Water (Surface, Eff., Ground)
20MAW-MW3-GW	1209871002	12/15/2020	12/17/2020	Water (Surface, Eff., Ground)
20MAW-MW10-GW	1209871003	12/15/2020	12/17/2020	Water (Surface, Eff., Ground)
20MAW-MW10-GWA	1209871004	12/15/2020	12/17/2020	Water (Surface, Eff., Ground)
20MAW-TB01	1209871005	12/15/2020	12/17/2020	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS LV
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
AK101	Gasoline Range Organics (W)
EPA 300.0	Ion Chromatographic Analysis (W)
SW6020B	Metals by ICP-MS
SM21 4500NO3-F	Nitrate/Nitrite Flow injection Pres.
SW8260D-SIM	SW8260-SIM (W)
SM21 4500P-B,E	Total Phosphorus (W)
SW8260D	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **20MAW-MW8-GW**
Lab Sample ID: 1209871001

	Parameter	Result	Units
Metals by ICP/MS	Iron	36800	ug/L
	Manganese	3910	ug/L
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	9.38	ug/L
	2-Methylnaphthalene	7.09	ug/L
	Acenaphthene	0.0401J	ug/L
	Naphthalene	43.3	ug/L
	Phenanthrene	0.0225J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	1.05	mg/L
	Residual Range Organics	0.472J	mg/L
Volatile Fuels	Gasoline Range Organics	2.39	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	153	ug/L
	1,2-Dichloroethane	3.04	ug/L
	1,3,5-Trimethylbenzene	39.7	ug/L
	4-Isopropyltoluene	7.87	ug/L
	Benzene	393	ug/L
	Ethylbenzene	196	ug/L
	Isopropylbenzene (Cumene)	35.3	ug/L
	Naphthalene	72.3	ug/L
	n-Propylbenzene	53.4	ug/L
	o-Xylene	52.7	ug/L
	P & M -Xylene	317	ug/L
	sec-Butylbenzene	4.22J	ug/L
	tert-Butylbenzene	1.95J	ug/L
	Toluene	7.94	ug/L
	Xylenes (total)	370	ug/L
Waters Department	Sulfate	6.92	mg/L
	Total Nitrate/Nitrite-N	0.0924J	mg/L
	Total Phosphorus	0.130	mg/L

Client Sample ID: **20MAW-MW3-GW**
Lab Sample ID: 1209871002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.244J	mg/L
	Residual Range Organics	0.361J	mg/L
Volatile Fuels	Benzene	0.190J	ug/L

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Detectable Results Summary

Client Sample ID: **20MAW-MW10-GW**
Lab Sample ID: 1209871003

	Parameter	Result	Units
Metals by ICP/MS	Iron	123000	ug/L
	Manganese	5450	ug/L
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	99.3	ug/L
	2-Methylnaphthalene	137	ug/L
	Fluorene	0.938	ug/L
	Naphthalene	354	ug/L
	Phenanthrene	0.273	ug/L
	Pyrene	0.0204J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	14.8	mg/L
	Residual Range Organics	1.30	mg/L
Volatile Fuels	Gasoline Range Organics	28.4	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	1640	ug/L
	1,2-Dibromoethane	4.22	ug/L
	1,3,5-Trimethylbenzene	424	ug/L
	4-Isopropyltoluene	12.2	ug/L
	Benzene	809	ug/L
	Ethylbenzene	941	ug/L
	Isopropylbenzene (Cumene)	83.7	ug/L
	Naphthalene	454	ug/L
	n-Propylbenzene	146	ug/L
	o-Xylene	2250	ug/L
	P & M -Xylene	5840	ug/L
	sec-Butylbenzene	18.7	ug/L
	tert-Butylbenzene	6.15J	ug/L
	Toluene	4940	ug/L
	Xylenes (total)	8090	ug/L
Volatile-SIM	1,2-Dibromoethane	3.80	ug/L
Waters Department	Sulfate	0.517	mg/L
	Total Nitrate/Nitrite-N	0.192J	mg/L
	Total Phosphorus	0.875	mg/L

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Detectable Results Summary

Client Sample ID: **20MAW-MW10-GWA**
Lab Sample ID: 1209871004

	Parameter	Result	Units
Metals by ICP/MS	Iron	125000	ug/L
	Manganese	5600	ug/L
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	118	ug/L
	2-Methylnaphthalene	165	ug/L
	Fluorene	0.820	ug/L
	Naphthalene	329	ug/L
	Phenanthrene	0.255	ug/L
	Pyrene	0.0202J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	14.4	mg/L
	Residual Range Organics	1.20	mg/L
Volatile Fuels	Gasoline Range Organics	29.0	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	1650	ug/L
	1,2-Dibromoethane	4.51	ug/L
	1,3,5-Trimethylbenzene	426	ug/L
	4-Isopropyltoluene	12.4	ug/L
	Benzene	824	ug/L
	Ethylbenzene	947	ug/L
	Isopropylbenzene (Cumene)	83.2	ug/L
	Naphthalene	463	ug/L
	n-Propylbenzene	145	ug/L
	o-Xylene	2280	ug/L
	P & M -Xylene	5920	ug/L
	sec-Butylbenzene	19.6	ug/L
	tert-Butylbenzene	6.18J	ug/L
	Toluene	4960	ug/L
	Xylenes (total)	8200	ug/L
Volatile-SIM	1,2-Dibromoethane	3.89	ug/L
Waters Department	Sulfate	0.471	mg/L
	Total Nitrate/Nitrite-N	0.192J	mg/L
	Total Phosphorus	0.926	mg/L

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Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Iron	36800		1000	300	ug/L	10		12/30/20 11:59
Manganese	3910		4.00	1.24	ug/L	10		12/30/20 11:59

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 12/30/20 11:59
Container ID: 1209871001-E

Prep Batch: MXX33902
Prep Method: SW3010A
Prep Date/Time: 12/21/20 10:14
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	9.38		0.0568	0.0170	ug/L	1		12/22/20 12:34
2-Methylnaphthalene	7.09		0.0568	0.0170	ug/L	1		12/22/20 12:34
Acenaphthene	0.0401	J	0.0568	0.0170	ug/L	1		12/22/20 12:34
Acenaphthylene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Anthracene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Benzo(a)Anthracene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Benzo[a]pyrene	0.0114	U	0.0227	0.00705	ug/L	1		12/22/20 12:34
Benzo[b]Fluoranthene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Benzo[g,h,i]perylene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Benzo[k]fluoranthene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Chrysene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Dibenzo[a,h]anthracene	0.0114	U	0.0227	0.00705	ug/L	1		12/22/20 12:34
Fluoranthene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Fluorene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Indeno[1,2,3-c,d] pyrene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Naphthalene	43.3		1.14	0.352	ug/L	10		12/23/20 18:09
Phenanthrene	0.0225	J	0.0568	0.0170	ug/L	1		12/22/20 12:34
Pyrene	0.0284	U	0.0568	0.0170	ug/L	1		12/22/20 12:34
Surrogates								
2-Methylnaphthalene-d10 (surr)	74.7		37-78		%	1		12/22/20 12:34
Fluoranthene-d10 (surr)	81.8		24-116		%	1		12/22/20 12:34

Batch Information

Analytical Batch: XMS12452
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/22/20 12:34
Container ID: 1209871001-C

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/20 12:40
Prep Initial Wt./Vol.: 220 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS12453
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/23/20 18:09
Container ID: 1209871001-C

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/20 12:40
Prep Initial Wt./Vol.: 220 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.05		0.588	0.176	mg/L	1		12/28/20 17:37
Surrogates								
5a Androstane (surr)	86.1		50-150		%	1		12/28/20 17:37

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 12/28/20 17:37
Container ID: 1209871001-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.472	J	0.490	0.147	mg/L	1		12/28/20 17:37
Surrogates								
n-Triacontane-d62 (surr)	95.2		50-150		%	1		12/28/20 17:37

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 12/28/20 17:37
Container ID: 1209871001-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.39		0.500	0.155	mg/L	5		12/23/20 19:20
Surrogates								
4-Bromofluorobenzene (surr)	130		50-150		%	5		12/23/20 19:20

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 19:20
Container ID: 1209871001-H

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	1.25	U	2.50	0.750	ug/L	5		12/21/20 22:41
1,1,1-Trichloroethane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,1,2,2-Tetrachloroethane	1.25	U	2.50	0.750	ug/L	5		12/21/20 22:41
1,1,2-Trichloroethane	1.00	U	2.00	0.600	ug/L	5		12/21/20 22:41
1,1-Dichloroethane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,1-Dichloroethene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,1-Dichloropropene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,2,3-Trichlorobenzene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,2,3-Trichloropropane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,2,4-Trichlorobenzene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,2,4-Trimethylbenzene	153		5.00	1.55	ug/L	5		12/21/20 22:41
1,2-Dibromo-3-chloropropane	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
1,2-Dibromoethane	0.188	U	0.375	0.0900	ug/L	5		12/21/20 22:41
1,2-Dichlorobenzene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,2-Dichloroethane	3.04		2.50	0.750	ug/L	5		12/21/20 22:41
1,2-Dichloropropane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,3,5-Trimethylbenzene	39.7		5.00	1.55	ug/L	5		12/21/20 22:41
1,3-Dichlorobenzene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
1,3-Dichloropropane	1.25	U	2.50	0.750	ug/L	5		12/21/20 22:41
1,4-Dichlorobenzene	1.25	U	2.50	0.750	ug/L	5		12/21/20 22:41
2,2-Dichloropropane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
2-Butanone (MEK)	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
2-Chlorotoluene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
2-Hexanone	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
4-Chlorotoluene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
4-Isopropyltoluene	7.87		5.00	1.55	ug/L	5		12/21/20 22:41
4-Methyl-2-pentanone (MIBK)	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
Benzene	393		2.00	0.600	ug/L	5		12/21/20 22:41
Bromobenzene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Bromochloromethane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Bromodichloromethane	1.25	U	2.50	0.750	ug/L	5		12/21/20 22:41
Bromoform	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Bromomethane	12.5	U	25.0	10.0	ug/L	5		12/21/20 22:41
Carbon disulfide	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
Carbon tetrachloride	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Chlorobenzene	1.25	U	2.50	0.750	ug/L	5		12/21/20 22:41
Chloroethane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41

Print Date: 01/11/2021 3:42:36PM

J flagging is activated

Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Chloromethane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
cis-1,2-Dichloroethene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
cis-1,3-Dichloropropene	1.25	U	2.50	0.750	ug/L	5		12/21/20 22:41
Dibromochloromethane	1.25	U	2.50	0.750	ug/L	5		12/21/20 22:41
Dibromomethane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Dichlorodifluoromethane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Ethylbenzene	196		5.00	1.55	ug/L	5		12/21/20 22:41
Freon-113	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
Hexachlorobutadiene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Isopropylbenzene (Cumene)	35.3		5.00	1.55	ug/L	5		12/21/20 22:41
Methylene chloride	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
Methyl-t-butyl ether	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
Naphthalene	72.3		5.00	1.55	ug/L	5		12/21/20 22:41
n-Butylbenzene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
n-Propylbenzene	53.4		5.00	1.55	ug/L	5		12/21/20 22:41
o-Xylene	52.7		5.00	1.55	ug/L	5		12/21/20 22:41
P & M -Xylene	317		10.0	3.10	ug/L	5		12/21/20 22:41
sec-Butylbenzene	4.22	J	5.00	1.55	ug/L	5		12/21/20 22:41
Styrene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
tert-Butylbenzene	1.95	J	5.00	1.55	ug/L	5		12/21/20 22:41
Tetrachloroethene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Toluene	7.94		5.00	1.55	ug/L	5		12/21/20 22:41
trans-1,2-Dichloroethene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
trans-1,3-Dichloropropene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Trichloroethene	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Trichlorofluoromethane	2.50	U	5.00	1.55	ug/L	5		12/21/20 22:41
Vinyl acetate	25.0	U	50.0	15.5	ug/L	5		12/21/20 22:41
Vinyl chloride	0.375	U	0.750	0.250	ug/L	5		12/21/20 22:41
Xylenes (total)	370		15.0	5.00	ug/L	5		12/21/20 22:41
Surrogates								
1,2-Dichloroethane-D4 (surr)	92		81-118		%	5		12/21/20 22:41
4-Bromofluorobenzene (surr)	93.6		85-114		%	5		12/21/20 22:41
Toluene-d8 (surr)	102		89-112		%	5		12/21/20 22:41

Print Date: 01/11/2021 3:42:36PM

J flagging is activated

Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 22:41
Container ID: 1209871001-K

Prep Batch: VXX36750
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	0.0125	U	0.0250	0.00625	ug/L	5		12/26/20 18:03
Surrogates								
4-Bromofluorobenzene (surr)	91.1		85-114		%	5		12/26/20 18:03
Toluene-d8 (surr)	97.4		89-112		%	5		12/26/20 18:03

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 18:03
Container ID: 1209871001-N

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW8-GW**

Client Sample ID: **20MAW-MW8-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871001
Lab Project ID: 1209871

Collection Date: 12/15/20 10:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Sulfate	6.92		1.00	0.250	mg/L	5		12/18/20 23:56

Batch Information

Analytical Batch: WIC6125
Analytical Method: EPA 300.0
Analyst: A.A
Analytical Date/Time: 12/18/20 23:56
Container ID: 1209871001-F

Prep Batch: WXX13572
Prep Method: METHOD
Prep Date/Time: 12/18/20 12:00
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Nitrate/Nitrite-N	0.0924	J	0.200	0.0500	mg/L	2		12/18/20 17:55

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Analyst: EWW
Analytical Date/Time: 12/18/20 17:55
Container ID: 1209871001-G

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Phosphorus	0.130		0.0400	0.0120	mg/L	1		12/23/20 10:48

Batch Information

Analytical Batch: WDA4915
Analytical Method: SM21 4500P-B,E
Analyst: EWW
Analytical Date/Time: 12/23/20 10:48
Container ID: 1209871001-G

Prep Batch: WXX13575
Prep Method: SM21 4500P-B,E
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 01/11/2021 3:42:36PM

J flagging is activated

Results of **20MAW-MW3-GW**

Client Sample ID: **20MAW-MW3-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871002
Lab Project ID: 1209871

Collection Date: 12/15/20 13:43
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW3

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.244	J	0.600	0.180	mg/L	1		12/28/20 17:47
Surrogates								
5a Androstane (surr)	85.1		50-150		%	1		12/28/20 17:47

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 12/28/20 17:47
Container ID: 1209871002-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.361	J	0.500	0.150	mg/L	1		12/28/20 17:47
Surrogates								
n-Triacontane-d62 (surr)	96.8		50-150		%	1		12/28/20 17:47

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 12/28/20 17:47
Container ID: 1209871002-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW3-GW**

Client Sample ID: **20MAW-MW3-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871002
Lab Project ID: 1209871

Collection Date: 12/15/20 13:43
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW3

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/28/20 17:47
Surrogates								
4-Bromofluorobenzene (surr)	98.5		50-150		%	1		12/28/20 17:47

Batch Information

Analytical Batch: VFC15475
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/28/20 17:47
Container ID: 1209871002-C

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.190	J	0.500	0.150	ug/L	1		12/28/20 17:47
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/28/20 17:47
o-Xylene	0.500	U	1.00	0.310	ug/L	1		12/28/20 17:47
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		12/28/20 17:47
Toluene	0.500	U	1.00	0.310	ug/L	1		12/28/20 17:47
Xylenes (total)	1.50	U	3.00	0.930	ug/L	1		12/28/20 17:47
Surrogates								
1,4-Difluorobenzene (surr)	79.5		77-115		%	1		12/28/20 17:47

Batch Information

Analytical Batch: VFC15475
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 12/28/20 17:47
Container ID: 1209871002-C

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Iron	123000		2500	750	ug/L	25		12/30/20 12:04
Manganese	5450		10.0	3.10	ug/L	25		12/30/20 12:04

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 12/30/20 12:04
Container ID: 1209871003-E

Prep Batch: MXX33902
Prep Method: SW3010A
Prep Date/Time: 12/21/20 10:14
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

SGS North America Inc.
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Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	99.3		0.962	0.288	ug/L	20		12/23/20 18:30
2-Methylnaphthalene	137		0.962	0.288	ug/L	20		12/23/20 18:30
Acenaphthene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Acenaphthylene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Anthracene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Benzo(a)Anthracene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Benzo[a]pyrene	0.00960 U		0.0192	0.00596	ug/L	1		12/22/20 12:54
Benzo[b]Fluoranthene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Benzo[g,h,i]perylene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Benzo[k]fluoranthene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Chrysene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Dibenzo[a,h]anthracene	0.00960 U		0.0192	0.00596	ug/L	1		12/22/20 12:54
Fluoranthene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Fluorene	0.938		0.0481	0.0144	ug/L	1		12/22/20 12:54
Indeno[1,2,3-c,d] pyrene	0.0240 U		0.0481	0.0144	ug/L	1		12/22/20 12:54
Naphthalene	354		9.62	2.98	ug/L	100		12/28/20 14:18
Phenanthrene	0.273		0.0481	0.0144	ug/L	1		12/22/20 12:54
Pyrene	0.0204 J		0.0481	0.0144	ug/L	1		12/22/20 12:54
Surrogates								
2-Methylnaphthalene-d10 (surr)	73.9		37-78		%	1		12/22/20 12:54
Fluoranthene-d10 (surr)	68.9		24-116		%	1		12/22/20 12:54

Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Polynuclear Aromatics GC/MS**

Batch Information

Analytical Batch: XMS12452
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/22/20 12:54
Container ID: 1209871003-C

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/20 12:40
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS12454
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/28/20 14:18
Container ID: 1209871003-C

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/20 12:40
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS12453
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/23/20 18:30
Container ID: 1209871003-C

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/20 12:40
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14.8		0.600	0.180	mg/L	1		12/28/20 17:57
Surrogates								
5a Androstane (surr)	94.3		50-150		%	1		12/28/20 17:57

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 12/28/20 17:57
Container ID: 1209871003-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.30		0.500	0.150	mg/L	1		12/28/20 17:57
Surrogates								
n-Triacontane-d62 (surr)	100		50-150		%	1		12/28/20 17:57

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 12/28/20 17:57
Container ID: 1209871003-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	28.4		5.00	1.55	mg/L	50		12/23/20 19:56
Surrogates								
4-Bromofluorobenzene (surr)	93		50-150		%	50		12/23/20 19:56

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 19:56
Container ID: 1209871003-H

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
1,1,1-Trichloroethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,1,2,2-Tetrachloroethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
1,1,2-Trichloroethane	2.00	U	4.00	1.20	ug/L	10		12/21/20 22:56
1,1-Dichloroethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,1-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,1-Dichloropropene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,2,3-Trichlorobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,2,3-Trichloropropane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,2,4-Trichlorobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,2,4-Trimethylbenzene	1640		10.0	3.10	ug/L	10		12/21/20 22:56
1,2-Dibromo-3-chloropropane	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
1,2-Dibromoethane	4.22		0.750	0.180	ug/L	10		12/21/20 22:56
1,2-Dichlorobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,2-Dichloroethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
1,2-Dichloropropane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,3,5-Trimethylbenzene	424		10.0	3.10	ug/L	10		12/21/20 22:56
1,3-Dichlorobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
1,3-Dichloropropane	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
1,4-Dichlorobenzene	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
2,2-Dichloropropane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
2-Butanone (MEK)	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
2-Chlorotoluene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
2-Hexanone	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
4-Chlorotoluene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
4-Isopropyltoluene	12.2		10.0	3.10	ug/L	10		12/21/20 22:56
4-Methyl-2-pentanone (MIBK)	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
Benzene	809		4.00	1.20	ug/L	10		12/21/20 22:56
Bromobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Bromochloromethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Bromodichloromethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
Bromoform	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Bromomethane	25.0	U	50.0	20.0	ug/L	10		12/21/20 22:56
Carbon disulfide	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
Carbon tetrachloride	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Chlorobenzene	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
Chloroethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56

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J flagging is activated

Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Chloromethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
cis-1,2-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
cis-1,3-Dichloropropene	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
Dibromochloromethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 22:56
Dibromomethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Dichlorodifluoromethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Ethylbenzene	941		10.0	3.10	ug/L	10		12/21/20 22:56
Freon-113	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
Hexachlorobutadiene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Isopropylbenzene (Cumene)	83.7		10.0	3.10	ug/L	10		12/21/20 22:56
Methylene chloride	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
Methyl-t-butyl ether	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
Naphthalene	454		10.0	3.10	ug/L	10		12/21/20 22:56
n-Butylbenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
n-Propylbenzene	146		10.0	3.10	ug/L	10		12/21/20 22:56
o-Xylene	2250		50.0	15.5	ug/L	50		12/21/20 22:12
P & M -Xylene	5840		100	31.0	ug/L	50		12/21/20 22:12
sec-Butylbenzene	18.7		10.0	3.10	ug/L	10		12/21/20 22:56
Styrene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
tert-Butylbenzene	6.15	J	10.0	3.10	ug/L	10		12/21/20 22:56
Tetrachloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Toluene	4940		50.0	15.5	ug/L	50		12/21/20 22:12
trans-1,2-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
trans-1,3-Dichloropropene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Trichloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Trichlorofluoromethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 22:56
Vinyl acetate	50.0	U	100	31.0	ug/L	10		12/21/20 22:56
Vinyl chloride	0.750	U	1.50	0.500	ug/L	10		12/21/20 22:56
Xylenes (total)	8090		150	50.0	ug/L	50		12/21/20 22:12
Surrogates								
1,2-Dichloroethane-D4 (surr)	89.3		81-118		%	10		12/21/20 22:56
4-Bromofluorobenzene (surr)	92.8		85-114		%	10		12/21/20 22:56
Toluene-d8 (surr)	103		89-112		%	10		12/21/20 22:56

Print Date: 01/11/2021 3:42:36PM

J flagging is activated

Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 22:12
Container ID: 1209871003-K

Prep Batch: VXX36750
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 22:56
Container ID: 1209871003-K

Prep Batch: VXX36750
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	3.80		0.0500	0.0125	ug/L	10		12/26/20 18:18
Surrogates								
4-Bromofluorobenzene (surr)	92.4		85-114		%	10		12/26/20 18:18
Toluene-d8 (surr)	97.1		89-112		%	10		12/26/20 18:18

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 18:18
Container ID: 1209871003-N

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW10-GW**

Client Sample ID: **20MAW-MW10-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871003
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Sulfate	0.517		0.200	0.0500	mg/L	1		12/29/20 15:21

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Analyst: A.A
Analytical Date/Time: 12/29/20 15:21
Container ID: 1209871003-F

Prep Batch: WXX13577
Prep Method: METHOD
Prep Date/Time: 12/29/20 10:00
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Nitrate/Nitrite-N	0.192	J	0.200	0.0500	mg/L	2		12/18/20 18:16

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Analyst: EWW
Analytical Date/Time: 12/18/20 18:16
Container ID: 1209871003-G

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Phosphorus	0.875		0.200	0.0600	mg/L	1		01/06/21 13:39

Batch Information

Analytical Batch: WDA4919
Analytical Method: SM21 4500P-B,E
Analyst: EWW
Analytical Date/Time: 01/06/21 13:39
Container ID: 1209871003-G

Prep Batch: WXX13580
Prep Method: SM21 4500P-B,E
Prep Date/Time: 01/06/21 10:36
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 25 mL

Print Date: 01/11/2021 3:42:36PM

J flagging is activated

Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Iron	125000		2500	750	ug/L	25		12/30/20 12:08
Manganese	5600		10.0	3.10	ug/L	25		12/30/20 12:08

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 12/30/20 12:08
Container ID: 1209871004-E

Prep Batch: MXX33902
Prep Method: SW3010A
Prep Date/Time: 12/21/20 10:14
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	118		1.01	0.302	ug/L	20		12/23/20 18:50
2-Methylnaphthalene	165		1.01	0.302	ug/L	20		12/23/20 18:50
Acenaphthene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Acenaphthylene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Anthracene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Benzo(a)Anthracene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Benzo[a]pyrene	0.0101 U		0.0202	0.00625	ug/L	1		12/22/20 13:15
Benzo[b]Fluoranthene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Benzo[g,h,i]perylene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Benzo[k]fluoranthene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Chrysene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Dibenzo[a,h]anthracene	0.0101 U		0.0202	0.00625	ug/L	1		12/22/20 13:15
Fluoranthene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Fluorene	0.820		0.0504	0.0151	ug/L	1		12/22/20 13:15
Indeno[1,2,3-c,d] pyrene	0.0252 U		0.0504	0.0151	ug/L	1		12/22/20 13:15
Naphthalene	329		10.1	3.13	ug/L	100		12/28/20 14:38
Phenanthrene	0.255		0.0504	0.0151	ug/L	1		12/22/20 13:15
Pyrene	0.0202 J		0.0504	0.0151	ug/L	1		12/22/20 13:15
Surrogates								
2-Methylnaphthalene-d10 (surr)	67.4		37-78		%	1		12/22/20 13:15
Fluoranthene-d10 (surr)	63.2		24-116		%	1		12/22/20 13:15

Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Polynuclear Aromatics GC/MS**

Batch Information

Analytical Batch: XMS12452
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/22/20 13:15
Container ID: 1209871004-C

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/20 12:40
Prep Initial Wt./Vol.: 248 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS12454
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/28/20 14:38
Container ID: 1209871004-C

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/20 12:40
Prep Initial Wt./Vol.: 248 mL
Prep Extract Vol: 1 mL

Analytical Batch: XMS12453
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/23/20 18:50
Container ID: 1209871004-C

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/20 12:40
Prep Initial Wt./Vol.: 248 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14.4		0.652	0.196	mg/L	1		12/28/20 18:07
Surrogates								
5a Androstane (surr)	88.9		50-150		%	1		12/28/20 18:07

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 12/28/20 18:07
Container ID: 1209871004-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.20		0.543	0.163	mg/L	1		12/28/20 18:07
Surrogates								
n-Triacontane-d62 (surr)	92.9		50-150		%	1		12/28/20 18:07

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 12/28/20 18:07
Container ID: 1209871004-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	29.0		5.00	1.55	mg/L	50		12/23/20 20:14
Surrogates								
4-Bromofluorobenzene (surr)	108		50-150		%	50		12/23/20 20:14

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 20:14
Container ID: 1209871004-H

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
1,1,1-Trichloroethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,1,2,2-Tetrachloroethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
1,1,2-Trichloroethane	2.00	U	4.00	1.20	ug/L	10		12/21/20 23:10
1,1-Dichloroethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,1-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,1-Dichloropropene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,2,3-Trichlorobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,2,3-Trichloropropane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,2,4-Trichlorobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,2,4-Trimethylbenzene	1650		10.0	3.10	ug/L	10		12/21/20 23:10
1,2-Dibromo-3-chloropropane	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
1,2-Dibromoethane	4.51		0.750	0.180	ug/L	10		12/21/20 23:10
1,2-Dichlorobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,2-Dichloroethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
1,2-Dichloropropane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,3,5-Trimethylbenzene	426		10.0	3.10	ug/L	10		12/21/20 23:10
1,3-Dichlorobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
1,3-Dichloropropane	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
1,4-Dichlorobenzene	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
2,2-Dichloropropane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
2-Butanone (MEK)	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
2-Chlorotoluene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
2-Hexanone	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
4-Chlorotoluene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
4-Isopropyltoluene	12.4		10.0	3.10	ug/L	10		12/21/20 23:10
4-Methyl-2-pentanone (MIBK)	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
Benzene	824		4.00	1.20	ug/L	10		12/21/20 23:10
Bromobenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Bromochloromethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Bromodichloromethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
Bromoform	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Bromomethane	25.0	U	50.0	20.0	ug/L	10		12/21/20 23:10
Carbon disulfide	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
Carbon tetrachloride	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Chlorobenzene	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
Chloroethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10

Print Date: 01/11/2021 3:42:36PM

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Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Chloromethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
cis-1,2-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
cis-1,3-Dichloropropene	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
Dibromochloromethane	2.50	U	5.00	1.50	ug/L	10		12/21/20 23:10
Dibromomethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Dichlorodifluoromethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Ethylbenzene	947		10.0	3.10	ug/L	10		12/21/20 23:10
Freon-113	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
Hexachlorobutadiene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Isopropylbenzene (Cumene)	83.2		10.0	3.10	ug/L	10		12/21/20 23:10
Methylene chloride	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
Methyl-t-butyl ether	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
Naphthalene	463		10.0	3.10	ug/L	10		12/21/20 23:10
n-Butylbenzene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
n-Propylbenzene	145		10.0	3.10	ug/L	10		12/21/20 23:10
o-Xylene	2280		50.0	15.5	ug/L	50		12/21/20 22:27
P & M -Xylene	5920		100	31.0	ug/L	50		12/21/20 22:27
sec-Butylbenzene	19.6		10.0	3.10	ug/L	10		12/21/20 23:10
Styrene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
tert-Butylbenzene	6.18	J	10.0	3.10	ug/L	10		12/21/20 23:10
Tetrachloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Toluene	4960		50.0	15.5	ug/L	50		12/21/20 22:27
trans-1,2-Dichloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
trans-1,3-Dichloropropene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Trichloroethene	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Trichlorofluoromethane	5.00	U	10.0	3.10	ug/L	10		12/21/20 23:10
Vinyl acetate	50.0	U	100	31.0	ug/L	10		12/21/20 23:10
Vinyl chloride	0.750	U	1.50	0.500	ug/L	10		12/21/20 23:10
Xylenes (total)	8200		150	50.0	ug/L	50		12/21/20 22:27
Surrogates								
1,2-Dichloroethane-D4 (surr)	88.6		81-118		%	10		12/21/20 23:10
4-Bromofluorobenzene (surr)	92.6		85-114		%	10		12/21/20 23:10
Toluene-d8 (surr)	105		89-112		%	10		12/21/20 23:10

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Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 22:27
Container ID: 1209871004-J

Prep Batch: VXX36750
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 23:10
Container ID: 1209871004-J

Prep Batch: VXX36750
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	3.89		0.0500	0.0125	ug/L	10		12/26/20 18:33
Surrogates								
4-Bromofluorobenzene (surr)	88.3		85-114		%	10		12/26/20 18:33
Toluene-d8 (surr)	96.6		89-112		%	10		12/26/20 18:33

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 18:33
Container ID: 1209871004-M

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW10-GWA**

Client Sample ID: **20MAW-MW10-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871004
Lab Project ID: 1209871

Collection Date: 12/15/20 15:36
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW10

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Sulfate	0.471		0.200	0.0500	mg/L	1		12/29/20 16:18

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Analyst: A.A
Analytical Date/Time: 12/29/20 16:18
Container ID: 1209871004-F

Prep Batch: WXX13577
Prep Method: METHOD
Prep Date/Time: 12/29/20 10:00
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Nitrate/Nitrite-N	0.192	J	0.200	0.0500	mg/L	2		12/18/20 18:18

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Analyst: EWW
Analytical Date/Time: 12/18/20 18:18
Container ID: 1209871004-G

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Phosphorus	0.926		0.0800	0.0240	mg/L	1		01/06/21 13:41

Batch Information

Analytical Batch: WDA4919
Analytical Method: SM21 4500P-B,E
Analyst: EWW
Analytical Date/Time: 01/06/21 13:41
Container ID: 1209871004-G

Prep Batch: WXX13580
Prep Method: SM21 4500P-B,E
Prep Date/Time: 01/06/21 10:36
Prep Initial Wt./Vol.: 12.5 mL
Prep Extract Vol: 25 mL

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Results of **20MAW-TB01**

Client Sample ID: **20MAW-TB01**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871005
Lab Project ID: 1209871

Collection Date: 12/15/20 08:00
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/23/20 15:26
Surrogates								
4-Bromofluorobenzene (surr)	103		50-150		%	1		12/23/20 15:26

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 15:26
Container ID: 1209871005-A

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 01/11/2021 3:42:36PM

J flagging is activated

Results of **20MAW-TB01**

Client Sample ID: **20MAW-TB01**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871005
Lab Project ID: 1209871

Collection Date: 12/15/20 08:00
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/21/20 17:08
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/21/20 17:08
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		12/21/20 17:08
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		12/21/20 17:08
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		12/21/20 17:08
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/21/20 17:08
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		12/21/20 17:08
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/21/20 17:08
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		12/21/20 17:08
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		12/21/20 17:08
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		12/21/20 17:08
Benzene	0.200	U	0.400	0.120	ug/L	1		12/21/20 17:08
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		12/21/20 17:08
Bromoform	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
Bromomethane	2.50	U	5.00	2.00	ug/L	1		12/21/20 17:08
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		12/21/20 17:08
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/21/20 17:08
Chloroethane	0.500	U	1.00	0.310	ug/L	1		12/21/20 17:08

Results of **20MAW-TB01**

Client Sample ID: **20MAW-TB01**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871005
Lab Project ID: 1209871

Collection Date: 12/15/20 08:00
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Chloromethane	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		12/21/20 17:08
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		12/21/20 17:08
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Freon-113	5.00 U		10.0	3.10	ug/L	1		12/21/20 17:08
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Methylene chloride	5.00 U		10.0	3.10	ug/L	1		12/21/20 17:08
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		12/21/20 17:08
Naphthalene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
o-Xylene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		12/21/20 17:08
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Styrene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Toluene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		12/21/20 17:08
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		12/21/20 17:08
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		12/21/20 17:08
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		12/21/20 17:08
Surrogates								
1,2-Dichloroethane-D4 (surr)	95		81-118		%	1		12/21/20 17:08
4-Bromofluorobenzene (surr)	95		85-114		%	1		12/21/20 17:08
Toluene-d8 (surr)	103		89-112		%	1		12/21/20 17:08

Print Date: 01/11/2021 3:42:36PM

J flagging is activated

Results of **20MAW-TB01**

Client Sample ID: **20MAW-TB01**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871005
Lab Project ID: 1209871

Collection Date: 12/15/20 08:00
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 17:08
Container ID: 1209871005-D

Prep Batch: VXX36750
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-TB01**

Client Sample ID: **20MAW-TB01**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209871005
Lab Project ID: 1209871

Collection Date: 12/15/20 08:00
Received Date: 12/17/20 10:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	0.00250	U	0.00500	0.00125	ug/L	1		12/26/20 17:17
Surrogates								
4-Bromofluorobenzene (surr)	94.6		85-114		%	1		12/26/20 17:17
Toluene-d8 (surr)	97.9		89-112		%	1		12/26/20 17:17

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 17:17
Container ID: 1209871005-G

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1814978 [MXX/33902]
Blank Lab ID: 1596297

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871003, 1209871004

Results by **SW6020B**

Parameter	Results	LOQ/CL	DL	Units
Iron	250U	500	150	ug/L
Manganese	1.00U	2.00	0.620	ug/L

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 12/30/2020 10:44:16AM

Prep Batch: MXX33902
Prep Method: SW3010A
Prep Date/Time: 12/21/2020 10:14:11AM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [MXX33902]
Blank Spike Lab ID: 1596298
Date Analyzed: 12/30/2020 10:48

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004

Results by **SW6020B**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Iron	5000	5410	108	(87-118)
Manganese	500	575	115	(87-115)

Batch Information

Analytical Batch: **MMS10977**
Analytical Method: **SW6020B**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **DMM**

Prep Batch: **MXX33902**
Prep Method: **SW3010A**
Prep Date/Time: **12/21/2020 10:14**
Spike Init Wt./Vol.: 5000 ug/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1596299
MS Sample ID: 1596300 MS
MSD Sample ID: 1596301 MSD

Analysis Date: 12/30/2020 10:53
Analysis Date: 12/30/2020 10:58
Analysis Date: 12/30/2020 11:03
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004

Results by **SW6020B**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Iron	163J	5000	5350	104	5000	5200	101	87-118	2.86	(< 20)
Manganese	1.75J	500	546	109	500	523	104	87-115	4.32	(< 20)

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Instrument: Perkin Elmer NexIon P5
Analyst: DMM
Analytical Date/Time: 12/30/2020 10:58:21AM

Prep Batch: MXX33902
Prep Method: 3010 H20 Digest for Metals ICP-MS
Prep Date/Time: 12/21/2020 10:14:11AM
Prep Initial Wt./Vol.: 25.00mL
Prep Extract Vol: 25.00mL

Print Date: 01/11/2021 3:42:45PM

Method Blank

Blank ID: MB for HBN 1815009 [VXX/36750]
Blank Lab ID: 1596418

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871003, 1209871004, 1209871005

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	2.00	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Method Blank

Blank ID: MB for HBN 1815009 [VXX/36750]
Blank Lab ID: 1596418

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871003, 1209871004, 1209871005

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	5.00U	10.0	3.10	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	91.6	81-118		%
4-Bromofluorobenzene (surr)	93.3	85-114		%
Toluene-d8 (surr)	105	89-112		%

Method Blank

Blank ID: MB for HBN 1815009 [VXX/36750]
Blank Lab ID: 1596418

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871003, 1209871004, 1209871005

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 12/21/2020 12:33:00PM

Prep Batch: VXX36750
Prep Method: SW5030B
Prep Date/Time: 12/21/2020 12:30:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VXX36750]
Blank Spike Lab ID: 1596419
Date Analyzed: 12/21/2020 12:47

Spike Duplicate ID: LCSD for HBN 1209871 [VXX36750]
Spike Duplicate Lab ID: 1596420
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004, 1209871005

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	31.8	106	30	31.9	106	(78-124)	0.20	(< 20)
1,1,1-Trichloroethane	30	29.0	97	30	29.0	97	(74-131)	0.00	(< 20)
1,1,2,2-Tetrachloroethane	30	28.5	95	30	28.9	96	(71-121)	1.20	(< 20)
1,1,2-Trichloroethane	30	31.2	104	30	31.8	106	(80-119)	2.20	(< 20)
1,1-Dichloroethane	30	29.4	98	30	29.3	98	(77-125)	0.44	(< 20)
1,1-Dichloroethene	30	30.4	101	30	30.2	101	(71-131)	0.81	(< 20)
1,1-Dichloropropene	30	30.5	102	30	30.4	101	(79-125)	0.44	(< 20)
1,2,3-Trichlorobenzene	30	32.5	108	30	34.8	116	(69-129)	6.90	(< 20)
1,2,3-Trichloropropane	30	28.5	95	30	28.7	96	(73-122)	0.74	(< 20)
1,2,4-Trichlorobenzene	30	31.6	105	30	33.5	112	(69-130)	6.00	(< 20)
1,2,4-Trimethylbenzene	30	28.7	96	30	28.6	96	(79-124)	0.34	(< 20)
1,2-Dibromo-3-chloropropane	30	27.1	90	30	28.2	94	(62-128)	4.20	(< 20)
1,2-Dibromoethane	30	32.5	108	30	32.9	110	(77-121)	1.40	(< 20)
1,2-Dichlorobenzene	30	29.6	99	30	30.0	100	(80-119)	1.50	(< 20)
1,2-Dichloroethane	30	26.2	87	30	26.5	89	(73-128)	1.50	(< 20)
1,2-Dichloropropane	30	30.9	103	30	31.1	104	(78-122)	0.76	(< 20)
1,3,5-Trimethylbenzene	30	28.4	95	30	28.5	95	(75-124)	0.31	(< 20)
1,3-Dichlorobenzene	30	30.1	100	30	30.0	100	(80-119)	0.10	(< 20)
1,3-Dichloropropane	30	30.8	103	30	31.3	104	(80-119)	1.50	(< 20)
1,4-Dichlorobenzene	30	29.8	99	30	29.8	99	(79-118)	0.15	(< 20)
2,2-Dichloropropane	30	26.6	89	30	26.4	88	(60-139)	0.86	(< 20)
2-Butanone (MEK)	90	92.9	103	90	96.3	107	(56-143)	3.70	(< 20)
2-Chlorotoluene	30	29.6	99	30	29.4	98	(79-122)	0.65	(< 20)
2-Hexanone	90	87.1	97	90	90.8	101	(57-139)	4.10	(< 20)
4-Chlorotoluene	30	28.1	94	30	28.0	94	(78-122)	0.27	(< 20)
4-Isopropyltoluene	30	29.5	98	30	29.9	100	(77-127)	1.30	(< 20)
4-Methyl-2-pentanone (MIBK)	90	91.5	102	90	93.9	104	(67-130)	2.60	(< 20)
Benzene	30	31.4	105	30	31.3	104	(79-120)	0.32	(< 20)
Bromobenzene	30	30.2	101	30	30.2	101	(80-120)	0.13	(< 20)
Bromochloromethane	30	31.4	105	30	31.8	106	(78-123)	1.00	(< 20)
Bromodichloromethane	30	29.7	99	30	30.0	100	(79-125)	1.10	(< 20)
Bromoform	30	32.6	109	30	33.8	113	(66-130)	3.50	(< 20)
Bromomethane	30	26.3	88	30	25.1	84	(53-141)	4.40	(< 20)
Carbon disulfide	45	44.8	100	45	43.8	97	(64-133)	2.20	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VXX36750]
Blank Spike Lab ID: 1596419
Date Analyzed: 12/21/2020 12:47

Spike Duplicate ID: LCSD for HBN 1209871 [VXX36750]
Spike Duplicate Lab ID: 1596420
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004, 1209871005

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	30.4	101	30	30.3	101	(72-136)	0.08	(< 20)
Chlorobenzene	30	31.5	105	30	31.3	104	(82-118)	0.82	(< 20)
Chloroethane	30	30.7	102	30	26.4	88	(60-138)	14.90	(< 20)
Chloroform	30	29.2	97	30	29.3	98	(79-124)	0.25	(< 20)
Chloromethane	30	29.9	100	30	29.3	98	(50-139)	2.10	(< 20)
cis-1,2-Dichloroethene	30	31.1	104	30	31.3	104	(78-123)	0.50	(< 20)
cis-1,3-Dichloropropene	30	30.6	102	30	31.0	103	(75-124)	1.50	(< 20)
Dibromochloromethane	30	31.9	106	30	32.4	108	(74-126)	1.30	(< 20)
Dibromomethane	30	30.0	100	30	30.5	102	(79-123)	1.60	(< 20)
Dichlorodifluoromethane	30	32.2	107	30	31.8	106	(32-152)	1.40	(< 20)
Ethylbenzene	30	31.5	105	30	31.7	106	(79-121)	0.60	(< 20)
Freon-113	45	45.7	102	45	45.3	101	(70-136)	0.74	(< 20)
Hexachlorobutadiene	30	30.5	102	30	31.2	104	(66-134)	2.30	(< 20)
Isopropylbenzene (Cumene)	30	31.3	104	30	31.5	105	(72-131)	0.62	(< 20)
Methylene chloride	30	29.4	98	30	29.5	98	(74-124)	0.26	(< 20)
Methyl-t-butyl ether	45	45.1	100	45	45.6	101	(71-124)	1.20	(< 20)
Naphthalene	30	30.1	100	30	32.6	109	(61-128)	8.00	(< 20)
n-Butylbenzene	30	29.1	97	30	29.8	100	(75-128)	2.60	(< 20)
n-Propylbenzene	30	28.8	96	30	28.8	96	(76-126)	0.18	(< 20)
o-Xylene	30	31.5	105	30	31.6	105	(78-122)	0.22	(< 20)
P & M -Xylene	60	62.8	105	60	63.5	106	(80-121)	1.10	(< 20)
sec-Butylbenzene	30	29.4	98	30	29.9	100	(77-126)	1.70	(< 20)
Styrene	30	31.4	105	30	31.7	106	(78-123)	0.96	(< 20)
tert-Butylbenzene	30	29.2	97	30	29.8	99	(78-124)	2.00	(< 20)
Tetrachloroethene	30	33.0	110	30	32.7	109	(74-129)	0.82	(< 20)
Toluene	30	31.0	103	30	30.9	103	(80-121)	0.21	(< 20)
trans-1,2-Dichloroethene	30	31.0	103	30	30.9	103	(75-124)	0.34	(< 20)
trans-1,3-Dichloropropene	30	29.8	99	30	30.3	101	(73-127)	1.60	(< 20)
Trichloroethene	30	30.9	103	30	30.7	102	(79-123)	0.73	(< 20)
Trichlorofluoromethane	30	30.5	102	30	30.1	100	(65-141)	1.30	(< 20)
Vinyl acetate	30	33.8	113	30	34.3	114	(54-146)	1.50	(< 20)
Vinyl chloride	30	29.8	100	30	29.4	98	(58-137)	1.60	(< 20)
Xylenes (total)	90	94.3	105	90	95.0	106	(79-121)	0.79	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VXX36750]
Blank Spike Lab ID: 1596419
Date Analyzed: 12/21/2020 12:47

Spike Duplicate ID: LCSD for HBN 1209871 [VXX36750]
Spike Duplicate Lab ID: 1596420
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004, 1209871005

Results by **SW8260D**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	90.3	90	30	90.8	91	(81-118)	0.57	
4-Bromofluorobenzene (surr)	30	92.7	93	30	91.6	92	(85-114)	1.20	
Toluene-d8 (surr)	30	104	104	30	104	104	(89-112)	0.37	

Batch Information

Analytical Batch: **VMS20529**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **NRB**

Prep Batch: **VXX36750**
Prep Method: **SW5030B**
Prep Date/Time: **12/21/2020 12:30**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1815085 [VXX/36757]
Blank Lab ID: 1596606

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871003, 1209871004, 1209871005

Results by **SW8260D-SIM**

Parameter	Results	LOQ/CL	DL	Units
1,2-Dibromoethane	0.00250U	0.00500	0.00125	ug/L
Surrogates				
4-Bromofluorobenzene (surr)	99.3	85-114		%
Toluene-d8 (surr)	98	89-112		%

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: NRB
Analytical Date/Time: 12/26/2020 4:16:00PM

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/2020 4:00:00PM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VXX36757]
Blank Spike Lab ID: 1596607
Date Analyzed: 12/26/2020 16:31

Spike Duplicate ID: LCSD for HBN 1209871 [VXX36757]
Spike Duplicate Lab ID: 1596608
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004, 1209871005

Results by **SW8260D-SIM**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2-Dibromoethane	0.2	0.195	97	0.2	0.198	99	(77-121)	1.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	30	95.6	96	30	96.4	96	(85-114)	0.88	(< 20)
Toluene-d8 (surr)	30	96.5	97	30	98.3	98	(89-112)	1.80	(< 20)

Batch Information

Analytical Batch: **VMS20532**
Analytical Method: **SW8260D-SIM**
Instrument: **VSA Agilent GC/MS 7890B/5977A**
Analyst: **NRB**

Prep Batch: **VXX36757**
Prep Method: **SW5030B**
Prep Date/Time: **12/26/2020 16:00**
Spike Init Wt./Vol.: 0.2 ug/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: 0.2 ug/L Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1815114 [VXX/36761]
Blank Lab ID: 1596704

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871003, 1209871004, 1209871005

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
1,4-Difluorobenzene (surr)	85.1	77-115		%
4-Bromofluorobenzene (surr)	99.6	50-150		%

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 12/23/2020 12:02:00PM

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VXX36761]
Blank Spike Lab ID: 1596705
Date Analyzed: 12/23/2020 12:56

Spike Duplicate ID: LCSD for HBN 1209871 [VXX36761]
Spike Duplicate Lab ID: 1596706
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004, 1209871005

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.01	101	1.00	0.991	99	(60-120)	2.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	106	106	0.0500	103	103	(50-150)	2.80	

Batch Information

Analytical Batch: **VFC15474**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX36761**
Prep Method: **SW5030B**
Prep Date/Time: **12/23/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1815114 [VXX/3676] L
Blank ba9 ID: 154671]

Ma2r,t : i a2pr xCWffa(puc ffEu. roWnGd

0 Q for CaS mpe:
1] s4871ss]

) peW2e 9R **AK101**

OaraS p2pr	) peW2e	bU0 /Qb	Db	y n,2e
. aeol,np) anPp UrPan,(e	sE5.5ssy	sE1ss	sE5.31s	S P/b
Surrogates				
g-BroS ofIWbro9pnzpnp xeWrd	1sg	5s-15s		%

Batch Information

AnalR2,(al Ba2(h: VFQ15g75
AnalR2,(al Mp2hoG: AK1s1
Ine2WS pn2 AP,lpn2784s OID/FID
AnalRe2 MDT
AnalR2,(al Da2p/T,S p: 1] /] 8/] s] s 3:57:ssOM

OrpmBa2(h: VXX3676]
OrpmMp2hoG: Ci 5s3sB
OrpmDa2p/T,S p: 1] /] 8/] s] s 6:ss:ssAM
Orpmln,2al i 2EVolE 5 S b
Orpmct 2a(2Vol: 5 S b

Or,n2Da2p: s1/11/] s] 1 3:g3:s] OM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VXX36762]
Blank Spike Lab ID: 1596713
Date Analyzed: 12/28/2020 16:51

Spike Duplicate ID: LCSD for HBN 1209871 [VXX36762]
Spike Duplicate Lab ID: 159671R
x atriW (ater ,SurfaceE. ffGE) roundP

4 C for Sa%pleM 1209871002

s eMultMby **AK101**

	Blank Spike ,%QLP			Spike Duplicate ,%QLP					
mara%eter	Spike	s eMult	s ec ,g P	Spike	s eMult	s ec ,g P	CL	s mD ,g P	s mD CL
) aMoline s anQe OrQanicM	1G0	0G969	97	1G0	0G982	98	, 60-120 P	1GR0	,< 20 P
Surrogates									
R-Bro%ofluorobenzene ,MurrP	0G500	107	107	0G500	10R	10R	, 50-150 P	2G50	

Batch Information

Analytical Batch: **VFC15475**
Analytical x ethod: **AK101**
InMru%ent: **Agilent 7890 PID/FID**
AnalyM: **MDT**

mrep Batch: **VXX3676W**
mrep x ethod: **S2 5030B**
mrep Date/Ti%e: **1WW8/W0W0 06:00**
Spike Init (tGVolG 1G0 %QL . Wtract Vol: 5 %L
Dupe Init (tGVolG 1G0 %QL . Wtract Vol: 5 %L

Method Blank

Blank ID: MB for HBN 1815110 9[VVX 3637]
Blank Lab ID: 1503617

Ma2r,t : i a2pr xCWffa(puc ffEu. roWnGd

4 Q for CaS mpe:
17s0861ss7

) peW2e bR SW8021B

OaraS p2pr	) peW2e	LU4 XQL	DL	y n,2e
BpnPpnp	sE75sy	sE5ss	sE15s	W XL
c2TRbpnPpnp	sE5ssy	1Esss	sE 1s	W XL
ohVRpnp	sE5ssy	1Esss	sE 1s	W XL
O g M hVRpnp	1Esssy	7Esss	sE37s	W XL
zolWpnp	sE5ssy	1Esss	sE 1s	W XL
VRpnpe x2o2ald	1E5sy	/ Esss	sE0/ s	W XL
Surrogates				
1uKhD,flWorobpnPpnp xeWrd	81E0	66h115		A

Batch Information

vnalR2,(al Ba2(T: [wQ15K65
vnalR2,(al Mp2ToG: Ci 8s71B
Ine2WSpn2 v-,lpn2680s OlDXwD
vnalRe2 MDz
vnalR2,(al Da2pXz,Sp: 17X78X7s7s / :56:ssOM

OrpmBa2(T: [VV/ 3637
OrpmMp2ToG: Ci 5s/ sB
OrpmDa2pXz,Sp: 17X78X7s7s 3:ss:ssvM
OrpmIn,2al i 2E{ olE 5 S L
Orpmct 2a(2[ol: 5 S L

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VXX36762]
Blank Spike Lab ID: 1596715
Date Analyzed: 12/28/2020 16:33

Spike Duplicate ID: LCSD for HBN 1209871 [VXX36762]
Spike Duplicate Lab ID: 1596716
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871002

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	116	116	100	110	110	(80-120)	5.30	(< 20)
Ethylbenzene	100	116	116	100	108	108	(75-125)	6.80	(< 20)
o-Xylene	100	115	115	100	107	107	(80-120)	7.50	(< 20)
P & M -Xylene	200	230	115	200	214	107	(75-130)	7.00	(< 20)
Toluene	100	118	118	100	112	112	(75-120)	5.20	(< 20)
Xylenes (total)	300	345	115	300	321	107	(79-121)	7.20	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	92.8	93	50	101	101	(77-115)	8.00	

Batch Information

Analytical Batch: **VFC15475**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX36762**
Prep Method: **SW5030B**
Prep Date/Time: **12/28/2020 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1814964 (WFI/2900)
Blank Lab ID: 1596287

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	0.100U	0.200	0.0500	mg/L
Nitrite-N	0.100U	0.200	0.0500	mg/L
Total Nitrate/Nitrite-N	0.100U	0.200	0.0500	mg/L

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 12/18/2020 5:13:54PM

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Method Blank

Blank ID: MB for HBN 1814964 (WFI/2900)
Blank Lab ID: 1596289

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871003, 1209871004

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	0.100U	0.200	0.0500	mg/L
Nitrite-N	0.100U	0.200	0.0500	mg/L
Total Nitrate/Nitrite-N	0.0502J	0.200	0.0500	mg/L

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 12/18/2020 5:59:24PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [WFI2900]
Blank Spike Lab ID: 1596286
Date Analyzed: 12/18/2020 17:12

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001

Results by **SM21 4500NO3-F**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2.5	2.36	94	(70-130)
Nitrite-N	2.5	2.48	99	(90-110)
Total Nitrate/Nitrite-N	5	4.84	97	(90-110)

Batch Information

Analytical Batch: **WFI2900**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

Print Date: 01/11/2021 3:43:16PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [WFI2900]
Blank Spike Lab ID: 1596288
Date Analyzed: 12/18/2020 17:57

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004

Results by **SM21 4500NO3-F**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2.5	2.32	93	(70-130)
Nitrite-N	2.5	2.51	100	(90-110)
Total Nitrate/Nitrite-N	5	4.83	97	(90-110)

Batch Information

Analytical Batch: **WFI2900**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

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Matrix Spike Summary

Original Sample ID: 1206643001
MS Sample ID: 1596227 MS
MSD Sample ID: 1596228 MSD

Analysis Date: 12/18/2020 16:31
Analysis Date: 12/18/2020 16:33
Analysis Date: 12/18/2020 16:35
Matrix: Drinking Water

QC for Samples:

Results by **SM21 4500NO3-F**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	0.200U	5.00	6.04	121 *	5.00	6.05	121 *	90-110	0.12	(< 25)

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 12/18/2020 4:33:39PM

Print Date: 01/11/2021 3:43:18PM

Matrix Spike Summary

Original Sample ID: 1206703002
MS Sample ID: 1596229 MS
MSD Sample ID: 1596230 MSD

QC for Samples: 1209871001

Analysis Date: 12/18/2020 17:17
Analysis Date: 12/18/2020 17:19
Analysis Date: 12/18/2020 17:20
Matrix: Drinking Water

Results by **SM21 4500NO3-F**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	0.200U	5.00	5.64	113 *	5.00	5.70	114 *	90-110	1.20	(< 25)

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 12/18/2020 5:19:08PM

Print Date: 01/11/2021 3:43:18PM

Matrix Spike Summary

Original Sample ID: 1206738001
MS Sample ID: 1596233 MS
MSD Sample ID: 1596234 MSD

Analysis Date: 12/18/2020 18:02
Analysis Date: 12/18/2020 18:04
Analysis Date: 12/18/2020 18:06
Matrix: Drinking Water

QC for Samples: 1209871001, 1209871003, 1209871004

Results by **SM21 4500NO3-F**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	0.100U	5.00	5.21	104	5.00	5.21	104	90-110	0.03	(< 25)

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 12/18/2020 6:04:39PM

Print Date: 01/11/2021 3:43:18PM

Method Blank

Blank ID: MB for HBN 1814997 [X / / 31027] L
Blank ba5 ID: 1296020

Matrix: X ater W8(rfauecEff.cGro(nd)

QC for Samples:
1] , 9871, , 1

Res(lts 5y **EPA 300.0**

Parameter	Res(lts	bOQ3Cb	Db	Units
S(lfate	, .1, , U	, .] , ,	, ., 2, ,	mg3b

Batch Information

Analytiual Batuh: X IC61] 2
Analytiual Method: EPA 0, , .,
Instr(ment: 90, Metrohm uompaut IC flex
Analyst: A.A
Analytiual Date3Time: 1] 3183] ,] ,] :47:0, PM

Prep Batuh: X / / 1027]
Prep Method: METHOD
Prep Date3Time: 1] 3183] ,] , 1] :, , :, , PM
Prep Initial X t.3/ol.: 1, mb
Prep Extraut Vol: 1, mb

Print Date: , 1311] ,] 1 0:40:] , PM

Method Blank

Blank ID: MB for HBN 1814997 [X / / 31027] L
Blank ba5 ID: 1296026

Matrix: X ater W8(rfauecEff.cGro(nd)

QC for Samples:
1] , 9871, , 1

Res(lts 5y **EPA 300.0**

Parameter	Res(lts	bOQ3Cb	Db	Units
S(lfate	, .1, , U	, .] , ,	, ., 2, ,	mg3b

Batch Information

Analytiual Batuh: X IC61] 2
Analytiual Method: EPA 0, , .,
Instr(ment: 90, Metrohm uompaut IC flex
Analyst: A.A
Analytiual Date3Time: 1] 3193] ,] , 1:01:01AM

Prep Batuh: X / / 1027]
Prep Method: METHOD
Prep Date3Time: 1] 3183] ,] , 1] :, , :, , PM
Prep Initial X t.3/ol.: 1, mb
Prep Extraut Vol: 1, mb

Print Date: , 1311] ,] 1 0:40:] , PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [MXX13] 72b
Blank Spike La5 ID: 1] 963] t
DaAe y nalzde/ : 124184 2020 1] :06

x aAiW MaAer (Surface, Eff., Groun/)

QC for Samples: 1209871001

ResulAs 5z **EPA 300.0**

Blank Spike (mg4L)

ParameAer	Spike	ResulA	Rec (%)	CL
SulfaAe	]	] .18	10t	(90-110)

Batch Information

y nalzAcal BaAch: **WIC6125**
y nalzAcal x eAno/ : **EPA 300.0**
InsAumenA **930 Metrohm compact IC flex**
y nalzsA **A.A**

Prep BaAch: **WXX13572**
Prep x eAno/ : **METHOD**
Prep DaAe4Time: **12/18/2020 12:00**
Spike IniAMAAVol.:] mg4L EWAacAVol: 10 mL
Dupe IniAMAAVol.: EWAacAVol:

PrinADaAe: 014114 2021 3:t 3:22Px

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [MXX13] 72b
Blank Spike La5 ID: 1] 963] 7
DaAe y nalzde/ : 124l194 2020 01:] 0

x aAiW MaAer (Surface, Eff., Groun/)

QC for Samples: 1209871001

ResulAs 5z **EPA 300.0**

Blank Spike (mg4L)

ParameAer	Spike	ResulA	Rec (%)	CL
SulfaAe	]	] .16	103	(90-110)

Batch Information

y nalzAcal BaAch: **WIC6125**
y nalzAcal x eAno/ : **EPA 300.0**
InsAumenA **930 Metrohm compact IC flex**
y nalzsA **A.A**

Prep BaAch: **WXX13572**
Prep x eAno/ : **METHOD**
Prep DaAe4Time: **12/18/2020 12:00**
Spike IniAMAAVol.:] mg4L EWAacAVol: 10 mL
Dupe IniAMAAVol.: EWAacAVol:

PrinADaAe: 014l142021 3:t 3:22Px

Matrix Spike Summary

Original Sample ID: 1596364
MS Sample ID: 1596368 MS
MSD Sample ID:

QC for Samples: 1209871001

Analysis Date: 12/18/2020 17:19
Analysis Date: 12/18/2020 17:38
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

Results by **EPA 300.0**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Sulfate	16.1	25.0	40.3	97				90-110		

Batch Information

Analytical Batch: WIC6125
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: A.A
Analytical Date/Time: 12/18/2020 5:38:02PM

Prep Batch: WXX13572
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 12/18/2020 12:00:00PM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

Matrix Spike Summary

Original Sample ID: 1596369
MS Sample ID: 1596376 MS
MSD Sample ID:

QC for Samples: 1209871001

Analysis Date: 12/18/2020 21:25
Analysis Date: 12/18/2020 21:44
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

Results by **EPA 300.0**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Sulfate	5.15	5.00	9.97	96				90-110		

Batch Information

Analytical Batch: WIC6125
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: A.A
Analytical Date/Time: 12/18/2020 9:44:13PM

Prep Batch: WXX13572
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 12/18/2020 12:00:00PM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

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Matrix Spike Summary

Original Sample ID: 1596377
MS Sample ID: 1596378 MS
MSD Sample ID:

QC for Samples: 1209871001

Analysis Date: 12/19/2020 2:09
Analysis Date: 12/19/2020 2:28
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

Results by **EPA 300.0**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Sulfate	4.56	5.00	9.29	95				90-110		

Batch Information

Analytical Batch: WIC6125
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: A.A
Analytical Date/Time: 12/19/2020 2:28:15AM

Prep Batch: WXX13572
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 12/18/2020 12:00:00PM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

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Method Blank

Blank ID: MB for HBN 1815024 [WXX/13575]
Blank Lab ID: 1596472

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001

Results by **SM21 4500P-B,E**

Parameter	Results	LOQ/CL	DL	Units
Total Phosphorus	0.0200U	0.0400	0.0120	mg/L

Batch Information

Analytical Batch: WDA4915
Analytical Method: SM21 4500P-B,E
Instrument: Discrete Analyzer 2
Analyst: EWW
Analytical Date/Time: 12/23/2020 10:36:39AM

Prep Batch: WXX13575
Prep Method: SM21 4500P-B,E
Prep Date/Time: 12/22/2020 4:15:00PM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [V XX136765
Blank Spike La] ID: 169bt 73
DaAe y nalzde/ : 12u23u2020 10:37

Spike DcpliRaAe ID: LCSD for HBN 1209871
[V XX136765
Spike DcpliRaAe La] ID: 169bt 7t
x aAiW V aAer (ScrfaRe, Eff., Grocn/)

QC for SampleM: 1209871001

s eMctlAM] z **SM21 4500P-B,E**

	Blank Spike (mguL)			Spike DcpliRaAe (mguL)					
ParameAer	Spike	s eMctlA	s eR(%)	Spike	s eMctlA	s eR(%)	CL	s PD (%)	s PD CL
4oAal P- oMb- orcM	0.2	0.20t	102	0.2	0.196	98	(76h126)	t .b0	(< 26)

Batch Information

y nalzARal BaAR- : **WDA4915**
y nalzARal x eA o/ : **SM21 4500P-B,E**
InMkcmenA **Discrete Analyzer 2**
y nalzMA **EWW**

Prep BaAR- : **WXX13575**
Prep x eA o/ : **SM21 4500P-B,E**
Prep DaAeu4ime: **12/22/2020 16:15**
Spike IniAV AuTol.: 0.2 mguL EWkaRATol: 26 mL
Dcpe IniAV AuTol.: 0.2 mguL EWkaRATol: 26 mL

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x em] er of SGS Grocp

Matrix Spike Summary

Original Sample ID: 1209876005
MS Sample ID: 1596475 MS
MSD Sample ID: 1596476 MSD

QC for Samples: 1209871001

Analysis Date: 12/23/2020 10:51
Analysis Date: 12/23/2020 10:52
Analysis Date: 12/23/2020 10:53
Matrix: Water (Surface, Eff., Ground)

Results by **SM21 4500P-B,E**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Phosphorus	0.0200U	0.200	.203	102	0.200	0.378	189 *	75-125	60.30 *	(< 25)

Batch Information

Analytical Batch: WDA4915
Analytical Method: SM21 4500P-B,E
Instrument: Discrete Analyzer 2
Analyst: EWW
Analytical Date/Time: 12/23/2020 10:52:16AM

Prep Batch: WXX13575
Prep Method: Total Phosphorus (W) Ext.
Prep Date/Time: 12/22/2020 4:15:00PM
Prep Initial Wt./Vol.: 25.00mL
Prep Extract Vol: 25.00mL

Print Date: 01/11/2021 3:43:29PM

Method Blank

Blank ID: MB for HBN 1814194 7[XX/134002
Blank] aL ID: 14b5818

MairxW[aipr (Curfacpt Eff.t Ground)

6 Q for CaS mpe:
1s, b801, , 3t 1s, b801, , 9

Rpeulie Ly **EPA 300.0**

ParaS pipr	Rpeulie	] O6 /Q]	D]	Unxie
Culfaip	, .1, , U	, .s, ,	, ., 4, ,	S g/]

Batch Information

Analyixcal Baich: [IQ51s5
Analyixcal Mpihod: EPA 3, , .,
IneiruS pni: b3, MpirohS coS maci IQ flpW
Analyei: A.A
Analyixcal Daip/TxS p: 1s/sb/s, s, s:s4:, , PM

PrpmBaich: [XX13400
PrpmMpihod: METHOD
PrpmDaip/TxS p: 1s/sb/s, s, 1, :, , :, , AM
PrpmInxixal [i./Vol.: 1, S]
PrpmEWiraci Vol: 1, S]

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [MXX13] 77b
Blank Spike La5 ID: 1] 96819
Date Analyzed: 12/29/2020 14:43

x atriW Mater (Surface, Eff., Ground)

QC for Samples: 1209871003, 1209871004

Results 5y **EPA 300.0**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Sulfate	]	] .11	102	(90-110)

Batch Information

Analytical Batch: **WIC6126**
Analytical x ethod: **EPA 300.0**
Instrument: **930 Metrohm compact IC flex**
Analyst: **A.A**

Prep Batch: **WXX13577**
Prep x ethod: **METHOD**
Prep Date/Time: **12/29/2020 10:00**
Spike Init Mt./Vol.:] mg/L EWtract Vol: 10 mL
Dupe Init Mt./Vol.: EWtract Vol:

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Matrix Spike Summary

Original Sample ID: 1596341
MS Sample ID: 1596344 MS
MSD Sample ID:

8nalAyiy Dase: 14t49t4242 13:14
8nalAyiy Dase: 14t49t4242 13:/ 1
8nalAyiy Dase:
Masri0: 7 aser xSWr(auef c((,f Er. VrhGo

k L (. r Sampley: 14293P122/ f 14293P122%

d eyWsy) A EPA 300.0

		Masri0 SpiRe xmgtbo			SpiRe DWpliuase xmgtbo					
Qarameser	Sample	SpiRe	d eyWs	d eu xC o	SpiRe	d eyWs	d eu xC o	L b	d QD xC o	d QD L b
SWr(ase	4,4/	5,22	P,2P	9P				92-112		

Batch Information

8nalAsiual Basuh: 7 IL 6146
8nalAsiual Mesh. G: c Q8 / 22,2
InysrWmens: 9/ 2 Mesr. hm u. mpausIL (le0
8nalAys: 8,8
8nalAsiual DasetTime: 14t49t4242 6:/ 1:2PQM

Qrep Basuh: 7 XX1/ 5PP
Qrep Mesh. G: c Q8 / 22,2 c 0srausi. n 7 aserytbiqWrGy
Qrep DasetTime: 14t49t4242 12:22:228M
Qrep Inisial 7 stV. l,: 12,22mb
Qrep c 0srausV. l: 12,22mb

QrinsDase: 21t11t4241 / :% :/ %QM

Matrix Spike Summary

Original Sample ID: 159634/
MS Sample ID: 159634%MS
MSD Sample ID:

8nalAyiy Dase: 14t49t4242 41:24
8nalAyiy Dase: 14t49t4242 41:41
8nalAyiy Dase:
Masri0: 7 aser xSWr(auef c((,f Er. VrhGo

k L (. r Sampley: 14293P122/ f 14293P122%

d eyWsy) A **EPA 300.0**

		Masri0 SpiRe xmgtbo			SpiRe DWpliuase xmgtbo					
Qarameser	Sample	SpiRe	d eyWs	d eu xC o	SpiRe	d eyWs	d eu xC o	L b	d QD xC o	d QD L b
SWr(ase	1,9/	5,22	6,3	93				92-112		

Batch Information

8nalAsiual Basuh: 7 IL 6146
8nalAsiual Mesh. G: c Q8 / 22,2
InysrWmens: 9/ 2 Mesr. hm u. mpausIL (le0
8nalAys: 8,8
8nalAsiual DasetTime: 14t49t4242 9:41:%2QM

Qrep Basuh: 7 XX1/ 5PP
Qrep Mesh. G: c Q8 / 22,2 c 0srausi. n 7 aserytbiqWiGy
Qrep DasetTime: 14t49t4242 12:22:228M
Qrep Inisial 7 stV. l,: 12,22mb
Qrep c 0srausV. l: 12,22mb

QrinsDase: 21t11t4241 / :% :/ %QM

Method Blank

Blank ID: MB for HBN 1815002 4[WWX1/ 5837
Blank] aL ID: 15b23b9

Matrix: [atpr (Curfacps, ffEs. rounGd

6 Q for CaS mlpe:
103b82133/ s103b821339

) peulte LR **SM21 4500P-B,E**

OaraS ptpr	) peulte	] U6 XQ]	D]	y nite
Potal OToemTorue	3E3033y	3E3933	3E3103	S hX[

Batch Information

gnalRtical BatcT: [Dg9b1b
gnalRtical MptToG: CM01 9533OABs
InetruS pnt: Diecrptp gnalR-pr 0
gnalRet: , [[
gnalRtical DatpXPiS p: 1XzX0301 1:08:09OM

OrpmBatcT: [WWI/ 583
OrpmMptToG: CM01 9533OABs
OrpmDatpXPiS p: 1XzX0301 13:/ z:33gM
OrpmInitial [tBXVolE 05 S]
Orpm, xtract Vol: 05 S]

Orint Datp: 31X1X0301 / :9/ :/ zOM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [V XX136805
Blank Spike La] ID: 1697096
Dabe t nalAyez: 01d0/ d2021 13:29

Spike Duplicabe ID: LCSD for HBN 1209871
[V XX136805
Spike Duplicabe La] ID: 169709/
Mabrix: V aber WSurface(, ffE . rounzG

g C for SaP ples: 1209871003(120987100Q

Resulbs] A **SM21 4500P-B,E**

	Blank Spike W%LG			Spike Duplicabe W%LG					
) araP eber	Spike	Resulb	Rec WhG	Spike	Resulb	Rec WhG	CL	R) D WhG	R) D CL
4obal) - osp- orus	0E2	0E203	101	0E2	0E196	97	W76h126 G	QE10	W26 G

Batch Information

t nalAbical Babc- : **WDA4919**
t nalAbical Meb oz: **SM21 4500P-B,E**
InsbruP enb **Discrete Analyzer 2**
t nalAsb **EWW**

) rep Babc- : **WXX13580**
) rep Meb oz: **SM21 4500P-B,E**
) rep Dabed4iP e: **01/06/2021 10:36**
Spike InibV bEdTolE: 0E2 P %L , xbracbTol: 26 P L
Dupe InibV bEdTolE: 0E2 P %L , xbracbTol: 26 P L

Matrix Spike Summary

Original Sample ID: 1209871003
MS Sample ID: 1597097 MS
MSD Sample ID: 1597098 MSD

Analysis Date: 01/06/2021 13:39
Analysis Date: 01/06/2021 13:40
Analysis Date: 01/06/2021 13:41
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871003, 1209871004

Results by **SM21 4500P-B,E**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Phosphorus	0.875	1.00	1.93	106	1.00	1.92	104	75-125	0.55	(< 25)

Batch Information

Analytical Batch: WDA4919
Analytical Method: SM21 4500P-B,E
Instrument: Discrete Analyzer 2
Analyst: EWW
Analytical Date/Time: 1/6/2021 1:40:10PM

Prep Batch: WXX13580
Prep Method: Total Phosphorus (W) Ext.
Prep Date/Time: 1/6/2021 10:36:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 25.00mL

Print Date: 01/11/2021 3:43:42PM

Method Blank

Blank ID: MB for HBN 1814939 [XXX/44324]
Blank Lab ID: 1596118

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871003, 1209871004

Results by **8270D SIM LV (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	78.6*	37-78		%
Fluoranthene-d10 (surr)	87.4	24-116		%

Batch Information

Analytical Batch: XMS12452
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: LAW
Analytical Date/Time: 12/22/2020 10:10:00AM

Prep Batch: XXX44324
Prep Method: SW3535A
Prep Date/Time: 12/18/2020 12:40:11PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [XXX44324]
Blank Spike Lab ID: 1596119
Date Analyzed: 12/22/2020 10:30

Spike Duplicate ID: LCSD for HBN 1209871 [XXX44324]
Spike Duplicate Lab ID: 1596120
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871003, 1209871004

Results by **8270D SIM LV (PAH)**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	2	1.54	77	2	1.58	79	(41-115)	2.60	(< 20)
2-Methylnaphthalene	2	1.59	79	2	1.61	81	(39-114)	1.60	(< 20)
Acenaphthene	2	1.59	80	2	1.64	82	(48-114)	2.70	(< 20)
Acenaphthylene	2	1.69	85	2	1.67	84	(35-121)	1.20	(< 20)
Anthracene	2	1.72	86	2	1.71	85	(53-119)	0.96	(< 20)
Benzo(a)Anthracene	2	1.52	76	2	1.45	73	(59-120)	4.70	(< 20)
Benzo[a]pyrene	2	1.83	92	2	1.70	85	(53-120)	7.30	(< 20)
Benzo[b]Fluoranthene	2	1.84	92	2	1.76	88	(53-126)	4.60	(< 20)
Benzo[g,h,i]perylene	2	1.80	90	2	1.74	87	(44-128)	3.30	(< 20)
Benzo[k]fluoranthene	2	1.80	90	2	1.71	86	(54-125)	5.10	(< 20)
Chrysene	2	1.76	88	2	1.69	85	(57-120)	4.00	(< 20)
Dibenzo[a,h]anthracene	2	1.82	91	2	1.76	88	(44-131)	3.60	(< 20)
Fluoranthene	2	1.72	86	2	1.70	85	(58-120)	1.10	(< 20)
Fluorene	2	1.69	84	2	1.73	86	(50-118)	2.50	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.95	97	2	1.86	93	(48-130)	4.40	(< 20)
Naphthalene	2	1.57	78	2	1.63	81	(43-114)	3.70	(< 20)
Phenanthrene	2	1.70	85	2	1.73	87	(53-115)	1.60	(< 20)
Pyrene	2	1.70	85	2	1.68	84	(53-121)	1.10	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2	77.4	77	2	80.3	80	* (37-78)	3.70	
Fluoranthene-d10 (surr)	2	83.7	84	2	85.8	86	(24-116)	2.40	

Batch Information

Analytical Batch: **XMS12452**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **LAW**

Prep Batch: **XXX44324**
Prep Method: **SW3535A**
Prep Date/Time: **12/18/2020 12:40**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1815008 [XXX/44331]
Blank Lab ID: 1596415

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871002, 1209871003, 1209871004

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	92.7	60-120		%

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 12/28/2020 4:58:00PM

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/2020 4:15:50PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VVVXX3316
Blank Spike La] ID: 1b95X15
Date Analyzed: 12/28/2020 17:08

Spike Duplicate ID: LCSD for HBN 1209871 [VVVXX3316
Spike Duplicate La] ID: 1b95X17
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871002, 1209871003, 120987100X

Results] y **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range 4 rganics	20	20.5	103	20	19.9	100	(7bC12b)	3.30	(- 20)
Surrogates									
ba Androstane (surr)	0.X	102	102	0.X	10X	10X	(50C120)	1.90	

Batch Information

Analytical Batc<: **XFC15834**
Analytical Met<od: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **IVM**

Prep Batc<: **XXX44331**
Prep Met<od: **SW3520C**
Prep Date/hime: **12/22/2020 16:15**
Spike Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL
Dupe Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL

Method Blank

Blank ID: MB for HBN 1815008 [XXX/44331]
Blank Lab ID: 1596415

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209871001, 1209871002, 1209871003, 1209871004

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.250U	0.500	0.150	mg/L
Surrogates				
nA riacontaneAd62 (surr)	98.4	60A120		%

Batch Information

hnalytical BatcF: XKC15834
hnalytical MetFod: hV103
Instrument: hgilent 7890B K
hnalyst: ITM
hnalytical Date/- ime: 12/28/2020 4:58:00PM

Prep BatcF: XXX44331
Prep MetFod: SW3520C
Prep Date/- ime: 12/22/2020 4:15:50PM
Prep Initial Wt./Tol.: 250 mL
Prep Extract Tol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209871 [VVVXX3316
Blank Spike La] ID: 1b95X15
Date Analyzed: 12/28/2020 17:08

Spike Duplicate ID: LCSD for HBN 1209871 [VVVXX3316
Spike Duplicate La] ID: 1b95X17
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209871001, 1209871002, 1209871003, 120987100X

Results] y **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range 4 rganics	20	19.b	97	20	19.1	95	(50C120)	1.70	(- 20)
Surrogates									
nCriacontaneCl52 (surr)	0.X	97.7	98	0.X	95.X	95	(50C120)	1.30	

Batch Information

Analytical Batch: **XFC15823**
Analytical Method: **AK102**
Instrument: **Agilent 4870B F**
Analyst: **I9V**

Prep Batch: **XXX33221**
Prep Method: **SM25W0C**
Prep Date/<ime: **1WWWW0W0 16:15**
Spike Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL
Dupe Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL

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Chain-of-Custody Report

Collection Organization: Jacobs
Project Number: MarkAir GW Monitoring
Chain-of-Custody: 20ADOT-MAW04
Laboratory: SGS
Cooler ID:
Bill To: Jacobs
NPDL Number: NA
Report To: Jacobs

COC Sample ID	Loc ID	Collection Date	Collection Time	Sampler	Quantity	Container Type	Volume	Preservative	Matrix	Analyses Requested Group	QC	TAT (days)	Notes:
20MAW-MW8-GW	MW8	12/15/2020	1036	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	1AB	14 Day	DRO/RRO
20MAW-MW8-GW	MW8	12/15/2020	1036	GW/KS	2	GA	250mL	<6°C	GW	SW8270 SIM	1CD	14 Day	PAHs
20MAW-MW8-GW	MW8	12/15/2020	1036	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A	1E	14 Day	Fe, Mn
20MAW-MW8-GW	MW8	12/15/2020	1036	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0	1F	14 Day	Sulfate
20MAW-MW8-GW	MW8	12/15/2020	1036	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E	1G	14 Day	NO2/NO3, Total Phos
20MAW-MW3-GW	MW3	12/15/2020	1343	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	2AB	14 Day	DRO/RRO
20MAW-MW10-GW	MW10	12/15/2020	1536	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	3AB	14 Day	DRO/RRO
20MAW-MW10-GW	MW10	12/15/2020	1536	GW/KS	2	GA	250mL	<6°C	GW	SW8270 SIM	3CD	14 Day	PAHs
20MAW-MW10-GW	MW10	12/15/2020	1536	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A	3E	14 Day	Fe, Mn
20MAW-MW10-GW	MW10	12/15/2020	1536	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0	3F	14 Day	Sulfate
20MAW-MW10-GW	MW10	12/15/2020	1536	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E	3G	14 Day	NO2/NO3, Total Phos
20MAW-MW10-GWA	MW10	12/15/2020	1536	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	4AB	14 Day	DRO/RRO
20MAW-MW10-GWA	MW10	12/15/2020	1536	GW/KS	2	GA	250mL	<6°C	GW	SW8270 SIM	4CD	14 Day	PAHs
20MAW-MW10-GWA	MW10	12/15/2020	1536	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A	4E	14 Day	Fe, Mn
20MAW-MW10-GWA	MW10	12/15/2020	1536	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0	4F	14 Day	Sulfate
20MAW-MW10-GWA	MW10	12/15/2020	1536	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E	4G	14 Day	NO2/NO3, Total Phos

Special Instructions:

Relinquish By: Kari Hagen /Kari Hagen — Signature/Printed Name — 12/16/2020 ~~1400~~ 1520 — Date/Time
Relinquish By: Jen Dawkins — Signature/Printed Name — 12-16-20 1520 — Date/Time

Received By: Jen Dawkins — Signature/Printed Name — 12-16-20 1620 — Date/Time
Received By: J Shumway — Signature/Printed Name — 12/17/2020 0924 — Date/Time

1F/1B D65 2.0

1209871

Profile # 365105

Chain-of-Custody Report

na 12.17.20

Collection Organization: Jacobs | Chain-of-Custody: 20ADOT-MAW03 | Cooler ID: | NPDL Number: NA
Project Number: MarkAir GW Monitoring | Laboratory: SGS | Bill To: Jacobs | Report To: Jacobs

COC Sample ID	Loc ID	Collection Date	Collection Time	Sampler	Quantity	Container Type	Volume	Preservative	Matrix	Analyses Requested Group	QC	TAT (days)	Notes:
20MAW-MW8-GW	MW8	12/15/2020	1036	GW/KS	12	VOA	40mL	<6°C; HCl	GW	AK101, SW8260, SW8260 SIM, RSK 175	(1AV)	14 Day	GRO, VOCs, EDB, Methane
20MAW-MW3-GW	MW3	12/15/2020	1343	GW/KS	3	VOA	40mL	<6°C; HCl	GW	AK101, SW8021	(2CE)	14 Day	GRO, BTEX
20MAW-MW10-GW	MW10	12/15/2020	1536	GW/KS	12	VOA	40mL	<6°C; HCl	GW	AK101, SW8260, SW8260 SIM, RSK 175	(3HSV)	14 Day	GRO, VOCs, EDB, Methane
20MAW-MW10-GWA	MW10	12/15/2020	1536	GW/KS	12	VOA	40mL	<6°C; HCl	GW	AK101, SW8260, SW8260 SIM, RSK 175	(4HP)	14 Day	GRO, VOCs, EDB, Methane
20MAW-TB01 (5AI)	MAW-TB01	12/15/2020	0800	GW/KS	9	VOA	40mL	<6°C; HCl	W	AK101, SW8260, SW8260 SIM	TB	14 Day	GRO, VOCs, EDB

Special Instructions:

Relinquish By: Kari Hagen /Kari Hagen 12/16/2020 1400 1520 Relinquish By: Jen Dawkins 12-16-20 1520
Signature/Printed Name Date/Time Signature/Printed Name Date/Time

Received By: Jen Dawkins 12-16-20 1600 Received By: J Shumway J Shumway 12/17/20 0024
Signature/Printed Name Date/Time Signature/Printed Name Date/Time

Profile #365105 JM

D65 2.0 12/18

1209871

e-Sample Receipt Form

SGS Workorder #: **1209871**

1 2 0 9 8 7 1

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		N/A — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1F,1B
COC accompanied samples?	N/A	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A — **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 2.0 °C Therm. ID: D65
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	There is 15 voa vials for sample 1 & 3.Proceeded with samples.
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020B).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

e-Sample Receipt Form FBK

SGS Workorder #:	1209871	1209871

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	Yes	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	Yes	
**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 1.4 °C Therm. ID: D23
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.	Yes	Cooler ID: 2 @ 3.4 °C Therm. ID: D51
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?		
If <0°C, were sample containers ice free?		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	N/C	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were samples in good condition (no leaks/cracks/breakage)?	Yes	
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/C	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
For Rush/Short Hold Time, was RUSH/Short HT email sent?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

SGS Profile #		0

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1209871001-A	HCL to pH < 2	OK
1209871001-B	HCL to pH < 2	OK
1209871001-C	No Preservative Required	OK
1209871001-D	No Preservative Required	OK
1209871001-E	HNO3 to pH < 2	OK
1209871001-F	No Preservative Required	OK
1209871001-G	H2SO4 to pH < 2	OK
1209871001-H	HCL to pH < 2	OK
1209871001-I	HCL to pH < 2	OK
1209871001-J	HCL to pH < 2	OK
1209871001-K	HCL to pH < 2	OK
1209871001-L	HCL to pH < 2	OK
1209871001-M	HCL to pH < 2	OK
1209871001-N	HCL to pH < 2	OK
1209871001-O	HCL to pH < 2	OK
1209871001-P	HCL to pH < 2	OK
1209871001-Q	HCL to pH < 2	OK
1209871001-R	HCL to pH < 2	OK
1209871001-S	HCL to pH < 2	OK
1209871001-T	HCL to pH < 2	OK
1209871001-U	HCL to pH < 2	OK
1209871001-V	HCL to pH < 2	OK
1209871002-A	HCL to pH < 2	OK
1209871002-B	HCL to pH < 2	OK
1209871002-C	HCL to pH < 2	OK
1209871002-D	HCL to pH < 2	OK
1209871002-E	HCL to pH < 2	OK
1209871003-A	HCL to pH < 2	OK
1209871003-B	HCL to pH < 2	OK
1209871003-C	No Preservative Required	OK
1209871003-D	No Preservative Required	OK
1209871003-E	HNO3 to pH < 2	OK
1209871003-F	No Preservative Required	OK
1209871003-G	H2SO4 to pH < 2	OK
1209871003-H	HCL to pH < 2	OK
1209871003-I	HCL to pH < 2	OK
1209871003-J	HCL to pH < 2	OK
1209871003-K	HCL to pH < 2	OK
1209871003-L	HCL to pH < 2	OK
1209871003-M	HCL to pH < 2	OK
1209871003-N	HCL to pH < 2	OK
1209871003-O	HCL to pH < 2	OK
1209871003-P	HCL to pH < 2	OK
1209871003-Q	HCL to pH < 2	OK
1209871003-R	HCL to pH < 2	OK
1209871003-S	HCL to pH < 2	OK
1209871003-T	HCL to pH < 2	OK
1209871003-U	HCL to pH < 2	OK
1209871003-V	HCL to pH < 2	OK
1209871004-A	HCL to pH < 2	OK
1209871004-B	HCL to pH < 2	OK
1209871004-C	No Preservative Required	OK
1209871004-D	No Preservative Required	OK
1209871004-E	HNO3 to pH < 2	OK
1209871004-F	No Preservative Required	OK
1209871004-G	H2SO4 to pH < 2	OK
1209871004-H	HCL to pH < 2	OK
1209871004-I	HCL to pH < 2	OK
1209871004-J	HCL to pH < 2	OK
1209871004-K	HCL to pH < 2	OK
1209871004-L	HCL to pH < 2	OK
1209871004-M	HCL to pH < 2	OK
1209871004-N	HCL to pH < 2	OK
1209871004-O	HCL to pH < 2	OK
1209871004-P	HCL to pH < 2	OK
1209871005-A	HCL to pH < 2	OK
1209871005-B	HCL to pH < 2	OK
1209871005-C	HCL to pH < 2	OK
1209871005-D	HCL to pH < 2	OK
1209871005-E	HCL to pH < 2	OK
1209871005-F	HCL to pH < 2	OK
1209871005-G	HCL to pH < 2	OK
1209871005-H	HCL to pH < 2	OK
1209871005-I	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

SGS North America, Inc

1209871

SGS Job Number: FA82050

Sampling Date: 12/15/20

Report to:

SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com

ATTN: Julie Shumway

Total number of pages in report: **17**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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EHS.US.CustomerCare@sgs.com

Sections: 1 2 3 4 5 6

Table of Contents

Sample Summary

SGS North America, Inc

1209871

Job No: FA82050

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FA82050-1	12/15/20	10:36	12/24/20	AQ	Water	20MAW-MW8-GW
FA82050-2	12/15/20	15:36	12/24/20	AQ	Water	20MAW-MW10-GW
FA82050-3	12/15/20	15:36	12/24/20	AQ	Water	20MAW-MW10-GWA

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: SGS North America, Inc **Job No:** FA82050

Site: 1209871 **Report Date:** 1/4/2021 4:31:29 PM

3 Sample(s) were collected on 12/15/2020 and were received at SGS North America Inc - Orlando on 12/24/2020 properly preserved, at 5.2 Deg. C and intact. These Samples received an SGS Orlando job number of FA82050. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

GC Volatiles By Method RSKSOP-147/175

Matrix: AQ **Batch ID:** G1R153

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) LA68517-2DUP, LA68517-3MS were used as the QC samples indicated.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Summary of Hits

Job Number: FA82050
Account: SGS North America, Inc
Project: 1209871
Collected: 12/15/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA82050-1	**20MAW-MW8-GW**					
Methane		312	0.50	0.25	ug/l	RSKSOP-147/175
FA82050-2	**20MAW-MW10-GW**					
Methane		1820	5.0	2.5	ug/l	RSKSOP-147/175
FA82050-3	**20MAW-MW10-GWA**					
Methane		2390	5.0	2.5	ug/l	RSKSOP-147/175

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	20MAW-MW8-GW		
Lab Sample ID:	FA82050-1	**Date Sampled:**	12/15/20
Matrix:	AQ - Water	**Date Received:**	12/24/20
Method:	RSKSOP-147/175	**Percent Solids:**	n/a
Project:	1209871		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1R4177.D	1	12/28/20 12:46	KB	n/a	n/a	G1R153
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	38.0 ml	5.0 ml	500 ul	25 Deg. C
Run #2				

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
74-82-8	Methane	312	0.50	0.25	0.16	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	20MAW-MW10-GW		
Lab Sample ID:	FA82050-2	**Date Sampled:**	12/15/20
Matrix:	AQ - Water	**Date Received:**	12/24/20
Method:	RSKSOP-147/175	**Percent Solids:**	n/a
Project:	1209871		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1R4182.D	10	12/28/20 14:16	KB	n/a	n/a	G1R153
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	38.0 ml	5.0 ml	500 ul	25 Deg. C
Run #2				

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
74-82-8	Methane	1820	5.0	2.5	1.6	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: 20MAW-MW10-GWA
Lab Sample ID: FA82050-3
Matrix: AQ - Water
Method: RSKSOP-147/175
Project: 1209871

Date Sampled: 12/15/20
Date Received: 12/24/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1R4184.D	10	12/28/20 15:22	KB	n/a	n/a	G1R153
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	38.0 ml	5.0 ml	500 ul	25 Deg. C
Run #2				

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
74-82-8	Methane	2390	5.0	2.5	1.6	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

5

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS North America Inc.
CHAIN OF CUSTODY RECORD

FA82050

Locations Nationwide
Alaska Florida
New Jersey Colorado
Texas North Carolina
Virginia Louisiana
www.us.sgs.com

CLIENT:	SGS North America Inc. - Alaska Division	SGS Reference:	SGS ORLANDO FL
CONTACT:	Julie Shumway	PHONE NO:	(907) 562-2343
PROJECT NAME:	1209871	PWSID#:	
		NPDL#:	
REPORTS TO: Julie Shumway		E-MAIL:	Julie.Shumway@sgs.com Env.Alaska.RefLabTeam@sgs.com
INVOICE TO:	SGS - Alaska	QUOTE #:	
		P.O. #:	1209871

Additional Comments: All soils report out in dry weight unless

Page 1 of 1

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/ MATRIX CODE	# CONTAINERS	Preservative Used:	Light Gases by RSK-175 (Methane only)	MS	MSD	SGS lab #	Location ID
						HCl					
						TYPE C = COMP G = GRAB MI = Multi Incremental Soils					
1	20MAW-MW8-GW	12/15/2020	10:36:00	Water	3		X			1209871001	MW8
2	20MAW-MW10-GW	12/15/2020	15:36:00	Water	3		X			1209871003	MW10
3	20MAW-MW10-GWA	12/15/2020	15:36:00	Water	2		X			1209871004	MW10

Relinquished By: (1)	Date	Time	Received By:	DOD Project?	YES / NO
	12/21/20	0908	FX	Report to DL (J Flags)? If J- Report as DL/LOD/LOQ.	YES
Relinquished By: (2)	Date	Time	Received By:	Data Deliverable Requirements:	LEVEL 2 + DV
FX				Cooler ID:	
Relinquished By: (3)	Date	Time	Received By:	Requested Turnaround Time and-or Special Instructions:	
Relinquished By: (4)	Date	Time	Received For Laboratory By:	Temp Blank °C:	Chain of Custody Seal: (Circle)
			Petra 12/21/20 1030	or Ambient [ ]	INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

5.2

F088_COC_REF_LAB_20190411

FA82050: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA82050 **Client:** SGS ALASKA **Project:** 1209871

Date / Time Received: 12/24/2020 10:30:00 AM **Delivery Method:** FX **Airbill #'s:** 1483 4801 2438

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (5.0);

Cooler Temps (Corrected) °C: Cooler 1: (5.2);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☑		☐	☐
2. Trip Blank listed on COC	☑		☐	☐

	W	or	S	N/A
3. Type Of TB Received	☑		☐	☐

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☑	☐
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: PETERH Date: 12/24/2020 10:30:00 Reviewer: _____ Date: _____

FA82050: Chain of Custody
Page 2 of 2

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA82050
Account: SGSAKA SGS North America, Inc
Project: 1209871

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
G1R153-MB	1R4159.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82050-1, FA82050-2, FA82050-3

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.16	ug/l	

Blank Spike/Blank Spike Duplicate Summary

Job Number: FA82050
Account: SGSAKA SGS North America, Inc
Project: 1209871

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
G1R153-BS	1R4161.D	1	12/28/20	KB	n/a	n/a	G1R153
G1R153-BSD	1R4162.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82050-1, FA82050-2, FA82050-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
74-82-8	Methane	108	105	97	111	103	6	62-139/30

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA82050
Account: SGSAKA SGS North America, Inc
Project: 1209871

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
LA68517-3MS	1R4172.D	1	12/28/20	KB	n/a	n/a	G1R153
LA68517-3	1R4165.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82050-1, FA82050-2, FA82050-3

CAS No.	Compound	LA68517-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	0.59		108	132	122	62-139

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA82050
Account: SGSAKA SGS North America, Inc
Project: 1209871

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
LA68517-2DUP	1R4171.D	1	12/28/20	KB	n/a	n/a	G1R153
LA68517-2	1R4164.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82050-1, FA82050-2, FA82050-3

CAS No.	Compound	LA68517-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	9.6		8.0		18	30

* = Outside of Control Limits.

Laboratory Report of Analysis

To: Jacobs Technology Inc.
794 University Ave #201
Fairbanks, AK 99709

Report Number: **1209876**

Client Project: **MarkAir GW Monitoring**

Dear Kari Hagen,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
2021.01.13
11:53:43 -09'00'

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Print Date: 01/11/2021 3:45:18PM

Results via Engage

Case Narrative

SGS Client: **Jacobs Technology Inc.**
SGS Project: **1209876**
Project Name/Site: **MarkAir GW Monitoring**
Project Contact: **Kari Hagen**

Refer to sample receipt form for information on sample condition.

20MAW-MW12-GW (1209876001) PS

Light Gases by RSK 175 (Methane only) were analyzed by SGS of Orlando, FL.

1206703002MS (1596229) MS

4500NO3-F - Nitrate/Nitrite - MS recovery for Total Nitrite / Nitrate is outside of QC criteria. Refer to LCS for accuracy requirements.

1206703002MSD (1596230) MSD

4500NO3-F - Nitrate/Nitrite - MSD recovery for Total Nitrite / Nitrate is outside of QC criteria. Refer to LCS for accuracy requirements.

1209876005MSD (1596476) MSD

4500P-B,E - Total Phosphorus - MSD recovery is outside of QC criteria. Refer to LCS for accuracy requirements.
4500P-B,E - Total Phosphorus - MS/MSD RPD was outside of QC criteria. Refer to LCS/LCSD for precision requirement.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 DW Chemistry & Microbiology (Provisionally Certified as of 12/03/2020 for Turbidity by SM2130B, Copper & Mercury by EPA200.8 and Trihalomethanes by EPA 524.2) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
20MAW-MW12-GW	1209876001	12/16/2020	12/18/2020	Water (Surface, Eff., Ground)
20MAW-MW9-GW	1209876002	12/16/2020	12/18/2020	Water (Surface, Eff., Ground)
20MAW-MW17-GW	1209876003	12/16/2020	12/18/2020	Water (Surface, Eff., Ground)
20MAW-MW17-GWA	1209876004	12/16/2020	12/18/2020	Water (Surface, Eff., Ground)
20MAW-MW5-GW	1209876005	12/16/2020	12/18/2020	Water (Surface, Eff., Ground)
20MAW-TB02	1209876006	12/16/2020	12/18/2020	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
SW8021B	BTEX 8021
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
EPA 300.0	Ion Chromatographic Analysis (W)
SW6020B	Metals by ICP-MS
SM21 4500NO3-F	Nitrate/Nitrite Flow injection Pres.
SW8260D-SIM	SW8260-SIM (W)
SM21 4500P-B,E	Total Phosphorus (W)
SW8260D	Volatile Organic Compounds(W)Custom List

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Detectable Results Summary

Client Sample ID: **20MAW-MW12-GW**
Lab Sample ID: 1209876001

	Parameter	Result	Units
Metals by ICP/MS	Iron	24800	ug/L
	Manganese	2990	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.603J	mg/L
	Residual Range Organics	0.350J	mg/L
Volatile Fuels	Benzene	1.70	ug/L
	Ethylbenzene	0.420J	ug/L
	Gasoline Range Organics	0.0364J	mg/L
	o-Xylene	1.02	ug/L
	P & M -Xylene	3.69	ug/L
	Toluene	1.06	ug/L
	Xylenes (total)	4.71	ug/L
Volatile GC/MS	1,2-Dichloroethane	0.378J	ug/L
Waters Department	Sulfate	8.93	mg/L
	Total Nitrate/Nitrite-N	0.0550J	mg/L
	Total Phosphorus	0.139	mg/L

Client Sample ID: **20MAW-MW9-GW**
Lab Sample ID: 1209876002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.412J	mg/L
	Residual Range Organics	0.438J	mg/L
Volatile Fuels	o-Xylene	0.320J	ug/L
	P & M -Xylene	0.900J	ug/L
	Toluene	0.370J	ug/L
	Xylenes (total)	1.22J	ug/L

Client Sample ID: **20MAW-MW17-GW**
Lab Sample ID: 1209876003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	3.05	mg/L
	Residual Range Organics	3.62	mg/L
Volatile Fuels	o-Xylene	0.330J	ug/L
	P & M -Xylene	0.830J	ug/L
	Toluene	0.340J	ug/L
	Xylenes (total)	1.16J	ug/L

Client Sample ID: **20MAW-MW17-GWA**
Lab Sample ID: 1209876004

	Parameter	Result	Units
Volatile Fuels	o-Xylene	0.320J	ug/L
	P & M -Xylene	0.760J	ug/L
	Toluene	0.340J	ug/L
	Xylenes (total)	1.08J	ug/L

Detectable Results Summary

Client Sample ID: **20MAW-MW5-GW**
Lab Sample ID: 1209876005

	Parameter	Result	Units
Metals by ICP/MS	Iron	996	ug/L
	Manganese	385	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.235J	mg/L
	Residual Range Organics	0.404J	mg/L
Volatile Fuels	P & M -Xylene	0.710J	ug/L
	Xylenes (total)	0.980J	ug/L
Waters Department	Sulfate	11.0	mg/L
	Total Nitrate/Nitrite-N	1.39	mg/L

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Results of **20MAW-MW12-GW**

Client Sample ID: **20MAW-MW12-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876001
Lab Project ID: 1209876

Collection Date: 12/16/20 09:45
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW12

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Iron	24800		1000	300	ug/L	10		12/30/20 12:13
Manganese	2990		4.00	1.24	ug/L	10		12/30/20 12:13

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 12/30/20 12:13
Container ID: 1209876001-C

Prep Batch: MXX33902
Prep Method: SW3010A
Prep Date/Time: 12/21/20 10:14
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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Results of **20MAW-MW12-GW**

Client Sample ID: **20MAW-MW12-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876001
Lab Project ID: 1209876

Collection Date: 12/16/20 09:45
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW12

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.603	J	0.638	0.191	mg/L	1		12/28/20 18:17
Surrogates								
5a Androstane (surr)	88.9		50-150		%	1		12/28/20 18:17

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 12/28/20 18:17
Container ID: 1209876001-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.350	J	0.532	0.160	mg/L	1		12/28/20 18:17
Surrogates								
n-Triacontane-d62 (surr)	96.3		50-150		%	1		12/28/20 18:17

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 12/28/20 18:17
Container ID: 1209876001-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW12-GW**

Client Sample ID: **20MAW-MW12-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876001
Lab Project ID: 1209876

Collection Date: 12/16/20 09:45
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW12

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0364	J	0.100	0.0310	mg/L	1		12/28/20 18:05
Surrogates								
4-Bromofluorobenzene (surr)	111		50-150		%	1		12/28/20 18:05

Batch Information

Analytical Batch: VFC15475
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/28/20 18:05
Container ID: 1209876001-F

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1.70		0.500	0.150	ug/L	1		12/28/20 18:05
Ethylbenzene	0.420	J	1.00	0.310	ug/L	1		12/28/20 18:05
o-Xylene	1.02		1.00	0.310	ug/L	1		12/28/20 18:05
P & M -Xylene	3.69		2.00	0.620	ug/L	1		12/28/20 18:05
Toluene	1.06		1.00	0.310	ug/L	1		12/28/20 18:05
Xylenes (total)	4.71		3.00	0.930	ug/L	1		12/28/20 18:05
Surrogates								
1,4-Difluorobenzene (surr)	79		77-115		%	1		12/28/20 18:05

Batch Information

Analytical Batch: VFC15475
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 12/28/20 18:05
Container ID: 1209876001-F

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW12-GW**

Client Sample ID: **20MAW-MW12-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876001
Lab Project ID: 1209876

Collection Date: 12/16/20 09:45
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW12

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichloroethane	0.378	J	0.500	0.150	ug/L	1		12/21/20 20:02
Surrogates								
1,2-Dichloroethane-D4 (surr)	94.1		81-118		%	1		12/21/20 20:02
4-Bromofluorobenzene (surr)	94.8		85-114		%	1		12/21/20 20:02
Toluene-d8 (surr)	103		89-112		%	1		12/21/20 20:02

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 20:02
Container ID: 1209876001-I

Prep Batch: VXX36751
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW12-GW**

Client Sample ID: **20MAW-MW12-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876001
Lab Project ID: 1209876

Collection Date: 12/16/20 09:45
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW12

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	0.00250	U	0.00500	0.00125	ug/L	1		12/26/20 19:19
Surrogates								
4-Bromofluorobenzene (surr)	89.3		85-114		%	1		12/26/20 19:19
Toluene-d8 (surr)	98.5		89-112		%	1		12/26/20 19:19

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 19:19
Container ID: 1209876001-L

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW12-GW**

Client Sample ID: **20MAW-MW12-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876001
Lab Project ID: 1209876

Collection Date: 12/16/20 09:45
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW12

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Sulfate	8.93		0.200	0.0500	mg/L	1		12/29/20 16:37

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Analyst: A.A
Analytical Date/Time: 12/29/20 16:37
Container ID: 1209876001-D

Prep Batch: WXX13577
Prep Method: METHOD
Prep Date/Time: 12/29/20 10:00
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Nitrate/Nitrite-N	0.0550	J	0.200	0.0500	mg/L	2		12/18/20 18:30

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Analyst: EWW
Analytical Date/Time: 12/18/20 18:30
Container ID: 1209876001-E

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Phosphorus	0.139		0.0400	0.0120	mg/L	1		12/23/20 10:50

Batch Information

Analytical Batch: WDA4915
Analytical Method: SM21 4500P-B,E
Analyst: EWW
Analytical Date/Time: 12/23/20 10:50
Container ID: 1209876001-E

Prep Batch: WXX13575
Prep Method: SM21 4500P-B,E
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 01/11/2021 3:45:27PM

J flagging is activated

Results of **20MAW-MW9-GW**

Client Sample ID: **20MAW-MW9-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876002
Lab Project ID: 1209876

Collection Date: 12/16/20 12:30
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW9

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.412	J	0.667	0.200	mg/L	1		12/28/20 18:26
Surrogates								
5a Androstane (surr)	85.6		50-150		%	1		12/28/20 18:26

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 12/28/20 18:26
Container ID: 1209876002-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 225 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.438	J	0.556	0.167	mg/L	1		12/28/20 18:26
Surrogates								
n-Triacontane-d62 (surr)	93.8		50-150		%	1		12/28/20 18:26

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 12/28/20 18:26
Container ID: 1209876002-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 225 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW9-GW**

Client Sample ID: **20MAW-MW9-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876002
Lab Project ID: 1209876

Collection Date: 12/16/20 12:30
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW9

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/28/20 18:23
Surrogates								
4-Bromofluorobenzene (surr)	98.6		50-150		%	1		12/28/20 18:23

Batch Information

Analytical Batch: VFC15475
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/28/20 18:23
Container ID: 1209876002-D

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		12/28/20 18:23
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/28/20 18:23
o-Xylene	0.320	J	1.00	0.310	ug/L	1		12/28/20 18:23
P & M -Xylene	0.900	J	2.00	0.620	ug/L	1		12/28/20 18:23
Toluene	0.370	J	1.00	0.310	ug/L	1		12/28/20 18:23
Xylenes (total)	1.22	J	3.00	0.930	ug/L	1		12/28/20 18:23
Surrogates								
1,4-Difluorobenzene (surr)	81.4		77-115		%	1		12/28/20 18:23

Batch Information

Analytical Batch: VFC15475
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 12/28/20 18:23
Container ID: 1209876002-D

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW9-GW**

Client Sample ID: **20MAW-MW9-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876002
Lab Project ID: 1209876

Collection Date: 12/16/20 12:30
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW9

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/21/20 20:17
Surrogates								
1,2-Dichloroethane-D4 (surr)	95.1		81-118		%	1		12/21/20 20:17
4-Bromofluorobenzene (surr)	93.7		85-114		%	1		12/21/20 20:17
Toluene-d8 (surr)	104		89-112		%	1		12/21/20 20:17

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 20:17
Container ID: 1209876002-G

Prep Batch: VXX36751
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW9-GW**

Client Sample ID: **20MAW-MW9-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876002
Lab Project ID: 1209876

Collection Date: 12/16/20 12:30
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW9

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	0.00250	U	0.00500	0.00125	ug/L	1		12/26/20 19:34
Surrogates								
4-Bromofluorobenzene (surr)	90		85-114		%	1		12/26/20 19:34
Toluene-d8 (surr)	98.3		89-112		%	1		12/26/20 19:34

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 19:34
Container ID: 1209876002-C

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW17-GW**

Client Sample ID: **20MAW-MW17-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876003
Lab Project ID: 1209876

Collection Date: 12/16/20 14:03
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW17

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3.05		0.625	0.188	mg/L	1		12/28/20 18:36
Surrogates								
5a Androstane (surr)	85.5		50-150		%	1		12/28/20 18:36

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 12/28/20 18:36
Container ID: 1209876003-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	3.62		0.521	0.156	mg/L	1		12/28/20 18:36
Surrogates								
n-Triacontane-d62 (surr)	99.1		50-150		%	1		12/28/20 18:36

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 12/28/20 18:36
Container ID: 1209876003-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW17-GW**

Client Sample ID: **20MAW-MW17-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876003
Lab Project ID: 1209876

Collection Date: 12/16/20 14:03
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW17

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/28/20 18:41
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	1		12/28/20 18:41

Batch Information

Analytical Batch: VFC15475
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/28/20 18:41
Container ID: 1209876003-C

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		12/28/20 18:41
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/28/20 18:41
o-Xylene	0.330	J	1.00	0.310	ug/L	1		12/28/20 18:41
P & M -Xylene	0.830	J	2.00	0.620	ug/L	1		12/28/20 18:41
Toluene	0.340	J	1.00	0.310	ug/L	1		12/28/20 18:41
Xylenes (total)	1.16	J	3.00	0.930	ug/L	1		12/28/20 18:41
Surrogates								
1,4-Difluorobenzene (surr)	80.7		77-115		%	1		12/28/20 18:41

Batch Information

Analytical Batch: VFC15475
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 12/28/20 18:41
Container ID: 1209876003-C

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW17-GW**

Client Sample ID: **20MAW-MW17-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876003
Lab Project ID: 1209876

Collection Date: 12/16/20 14:03
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW17

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/23/20 03:18
Surrogates								
1,2-Dichloroethane-D4 (surr)	93.7		81-118		%	1		12/23/20 03:18
4-Bromofluorobenzene (surr)	92.6		85-114		%	1		12/23/20 03:18
Toluene-d8 (surr)	103		89-112		%	1		12/23/20 03:18

Batch Information

Analytical Batch: VMS20530
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/23/20 03:18
Container ID: 1209876003-H

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/20 18:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-MW17-GW**

Client Sample ID: **20MAW-MW17-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876003
Lab Project ID: 1209876

Collection Date: 12/16/20 14:03
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW17

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	0.00250	U	0.00500	0.00125	ug/L	1		12/26/20 19:49
Surrogates								
4-Bromofluorobenzene (surr)	89.3		85-114		%	1		12/26/20 19:49
Toluene-d8 (surr)	98.2		89-112		%	1		12/26/20 19:49

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 19:49
Container ID: 1209876003-I

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW17-GWA**

Client Sample ID: **20MAW-MW17-GWA**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876004
Lab Project ID: 1209876

Collection Date: 12/16/20 14:03
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW17

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		12/28/20 18:59
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/28/20 18:59
o-Xylene	0.320	J	1.00	0.310	ug/L	1		12/28/20 18:59
P & M -Xylene	0.760	J	2.00	0.620	ug/L	1		12/28/20 18:59
Toluene	0.340	J	1.00	0.310	ug/L	1		12/28/20 18:59
Xylenes (total)	1.08	J	3.00	0.930	ug/L	1		12/28/20 18:59
Surrogates								
1,4-Difluorobenzene (surr)	80.8		77-115		%	1		12/28/20 18:59

Batch Information

Analytical Batch: VFC15475
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 12/28/20 18:59
Container ID: 1209876004-A

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 01/11/2021 3:45:27PM

J flagging is activated

Results of **20MAW-MW5-GW**

Client Sample ID: **20MAW-MW5-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876005
Lab Project ID: 1209876

Collection Date: 12/16/20 16:21
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Iron	996		500	150	ug/L	5		12/30/20 12:18
Manganese	385		2.00	0.620	ug/L	5		12/30/20 12:18

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 12/30/20 12:18
Container ID: 1209876005-C

Prep Batch: MXX33902
Prep Method: SW3010A
Prep Date/Time: 12/21/20 10:14
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW-MW5-GW**

Client Sample ID: **20MAW-MW5-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876005
Lab Project ID: 1209876

Collection Date: 12/16/20 16:21
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.235	J	0.588	0.176	mg/L	1		12/28/20 18:46
Surrogates								
5a Androstane (surr)	84		50-150		%	1		12/28/20 18:46

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 12/28/20 18:46
Container ID: 1209876005-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.404	J	0.490	0.147	mg/L	1		12/28/20 18:46
Surrogates								
n-Triacontane-d62 (surr)	93.7		50-150		%	1		12/28/20 18:46

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 12/28/20 18:46
Container ID: 1209876005-A

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of **20MAW-MW5-GW**

Client Sample ID: **20MAW-MW5-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876005
Lab Project ID: 1209876

Collection Date: 12/16/20 16:21
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/28/20 19:17
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	1		12/28/20 19:17

Batch Information

Analytical Batch: VFC15475
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/28/20 19:17
Container ID: 1209876005-F

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250	U	0.500	0.150	ug/L	1		12/28/20 19:17
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/28/20 19:17
o-Xylene	0.500	U	1.00	0.310	ug/L	1		12/28/20 19:17
P & M -Xylene	0.710	J	2.00	0.620	ug/L	1		12/28/20 19:17
Toluene	0.500	U	1.00	0.310	ug/L	1		12/28/20 19:17
Xylenes (total)	0.980	J	3.00	0.930	ug/L	1		12/28/20 19:17
Surrogates								
1,4-Difluorobenzene (surr)	81.6		77-115		%	1		12/28/20 19:17

Batch Information

Analytical Batch: VFC15475
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 12/28/20 19:17
Container ID: 1209876005-F

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 01/11/2021 3:45:27PM

J flagging is activated

Results of **20MAW-MW5-GW**

Client Sample ID: **20MAW-MW5-GW**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876005
Lab Project ID: 1209876

Collection Date: 12/16/20 16:21
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Sulfate	11.0		0.200	0.0500	mg/L	1		12/29/20 17:15

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Analyst: A.A
Analytical Date/Time: 12/29/20 17:15
Container ID: 1209876005-D

Prep Batch: WXX13577
Prep Method: METHOD
Prep Date/Time: 12/29/20 10:00
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Nitrate/Nitrite-N	1.39		0.200	0.0500	mg/L	2		12/18/20 18:32

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Analyst: EWW
Analytical Date/Time: 12/18/20 18:32
Container ID: 1209876005-E

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Total Phosphorus	0.0200	U	0.0400	0.0120	mg/L	1		12/23/20 10:51

Batch Information

Analytical Batch: WDA4915
Analytical Method: SM21 4500P-B,E
Analyst: EWW
Analytical Date/Time: 12/23/20 10:51
Container ID: 1209876005-E

Prep Batch: WXX13575
Prep Method: SM21 4500P-B,E
Prep Date/Time: 12/22/20 16:15
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 01/11/2021 3:45:27PM

J flagging is activated

Results of **20MAW-TB02**

Client Sample ID: **20MAW-TB02**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876006
Lab Project ID: 1209876

Collection Date: 12/16/20 08:00
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB02

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500 U		0.100	0.0310	mg/L	1		12/28/20 17:29
Surrogates								
4-Bromofluorobenzene (surr)	94.2		50-150		%	1		12/28/20 17:29

Batch Information

Analytical Batch: VFC15475
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/28/20 17:29
Container ID: 1209876006-A

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250 U		0.500	0.150	ug/L	1		12/28/20 17:29
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		12/28/20 17:29
o-Xylene	0.500 U		1.00	0.310	ug/L	1		12/28/20 17:29
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		12/28/20 17:29
Toluene	0.500 U		1.00	0.310	ug/L	1		12/28/20 17:29
Xylenes (total)	1.50 U		3.00	0.930	ug/L	1		12/28/20 17:29
Surrogates								
1,4-Difluorobenzene (surr)	81.3		77-115		%	1		12/28/20 17:29

Batch Information

Analytical Batch: VFC15475
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 12/28/20 17:29
Container ID: 1209876006-A

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 01/11/2021 3:45:27PM

J flagging is activated

Results of **20MAW-TB02**

Client Sample ID: **20MAW-TB02**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876006
Lab Project ID: 1209876

Collection Date: 12/16/20 08:00
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB02

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/21/20 15:56
Surrogates								
1,2-Dichloroethane-D4 (surr)	93.9		81-118		%	1		12/21/20 15:56
4-Bromofluorobenzene (surr)	94.9		85-114		%	1		12/21/20 15:56
Toluene-d8 (surr)	103		89-112		%	1		12/21/20 15:56

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/21/20 15:56
Container ID: 1209876006-D

Prep Batch: VXX36751
Prep Method: SW5030B
Prep Date/Time: 12/21/20 12:30
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW-TB02**

Client Sample ID: **20MAW-TB02**
Client Project ID: **MarkAir GW Monitoring**
Lab Sample ID: 1209876006
Lab Project ID: 1209876

Collection Date: 12/16/20 08:00
Received Date: 12/18/20 08:47
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB02

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	0.00250	U	0.00500	0.00125	ug/L	1		12/26/20 17:32
Surrogates								
4-Bromofluorobenzene (surr)	96.8		85-114		%	1		12/26/20 17:32
Toluene-d8 (surr)	98.4		89-112		%	1		12/26/20 17:32

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 17:32
Container ID: 1209876006-G

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1814978 [MXX/33902]
Blank Lab ID: 1596297

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876005

Results by **SW6020B**

Parameter	Results	LOQ/CL	DL	Units
Iron	250U	500	150	ug/L
Manganese	1.00U	2.00	0.620	ug/L

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 12/30/2020 10:44:16AM

Prep Batch: MXX33902
Prep Method: SW3010A
Prep Date/Time: 12/21/2020 10:14:11AM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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Member of SGS Group

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [MXX33902]
Blank Spike Lab ID: 1596298
Date Analyzed: 12/30/2020 10:48

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876005

Results by **SW6020B**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Iron	5000	5410	108	(87-118)
Manganese	500	575	115	(87-115)

Batch Information

Analytical Batch: **MMS10977**
Analytical Method: **SW6020B**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **DMM**

Prep Batch: **MXX33902**
Prep Method: **SW3010A**
Prep Date/Time: **12/21/2020 10:14**
Spike Init Wt./Vol.: 5000 ug/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1596299
MS Sample ID: 1596300 MS
MSD Sample ID: 1596301 MSD

Analysis Date: 12/30/2020 10:53
Analysis Date: 12/30/2020 10:58
Analysis Date: 12/30/2020 11:03
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876005

Results by **SW6020B**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Iron	163J	5000	5350	104	5000	5200	101	87-118	2.86	(< 20)
Manganese	1.75J	500	546	109	500	523	104	87-115	4.32	(< 20)

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Instrument: Perkin Elmer NexIon P5
Analyst: DMM
Analytical Date/Time: 12/30/2020 10:58:21AM

Prep Batch: MXX33902
Prep Method: 3010 H20 Digest for Metals ICP-MS
Prep Date/Time: 12/21/2020 10:14:11AM
Prep Initial Wt./Vol.: 25.00mL
Prep Extract Vol: 25.00mL

Print Date: 01/11/2021 3:45:34PM

Method Blank

Blank ID: MB for HBN 1815010 [VXX/36751]
Blank Lab ID: 1596421

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876002, 1209876006

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	96.4	81-118		%
4-Bromofluorobenzene (surr)	93.7	85-114		%
Toluene-d8 (surr)	105	89-112		%

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 12/21/2020 2:58:00PM

Prep Batch: VXX36751
Prep Method: SW5030B
Prep Date/Time: 12/21/2020 12:30:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Leaching Blank

Blank ID: LB for HBN 1814933 [TCLP/10940
Blank Lab ID: 1596105

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876002, 1209876006

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2-Dichloroethane	12.5U	25.0	7.50	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	94.7	81-118		%
4-Bromofluorobenzene (surr)	94.3	85-114		%
Toluene-d8 (surr)	103	89-112		%

Batch Information

Analytical Batch: VMS20529
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 12/21/2020 5:23:00PM

Prep Batch: VXX36751
Prep Method: SW5030B
Prep Date/Time: 12/21/2020 12:30:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [VXX36751]
Blank Spike Lab ID: 1596422
Date Analyzed: 12/21/2020 13:16

Spike Duplicate ID: LCSD for HBN 1209876 [VXX36751]
Spike Duplicate Lab ID: 1596423
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876002, 1209876006

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2-Dichloroethane	30	26.7	89	30	26.6	89	(73-128)	0.56	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	90.5	91	30	90.3	90	(81-118)	0.31	
4-Bromofluorobenzene (surr)	30	92.1	92	30	91.1	91	(85-114)	1.20	
Toluene-d8 (surr)	30	104	104	30	105	105	(89-112)	0.71	

Batch Information

Analytical Batch: **VMS20529**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **NRB**

Prep Batch: **VXX36751**
Prep Method: **SW5030B**
Prep Date/Time: **12/21/2020 12:30**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 18150[8 VX/ / 367] 5[L
Blank ba9 ID: 1547240

Ma,rti : x a,er VS(rfauecEff.cGro(nd)

QC for Samples:
1[048] 7006

Res(l,s 9y **SW8260D**

Parame,er	Res(l,s	bOQ3Cb	Db	Unt,s
1c[-Dtuhloroe,hane	0.[50U	0.500	0.150	(g3b
Surrogates				
1c[-Dtuhloroe,hane-D2 Vs(rr)	41.7	81-118		%
2-Bromofl(oro9enzene Vs(rr)	46.[	85-112		%
Tol(ene-d8 Vs(rr)	105	84-11[		%

Batch Information

Analy,tual Ba,uh: XMS[0560
Analy,tual Me,hod: Sx 8[70D
Ins,r(men,: Agtlen,] 840-] 5MS
Analys,: NRB
Analy,tual Da,e3Ttme: 1[3[[3[0[0 7:01:00PM

Prep Ba,uh: X/ / 67] 5[
Prep Me,hod: Sx 5060B
Prep Da,e3Ttme: 1[3[[3[0[0 7:00:00PM
Prep Int,tal x ,.3Xol.: 5 mb
Prep Ei ,rau, Xol: 5 mb

Leaching Blank

Blank ID: bB for HBN 1812482 VTCbP3l0426
Blank ba9 ID: 15476[5

Ma,rti : x a,er VS(rfauecEff.cGro(nd)

QC for Samples:
1[048] 7006

Res(l,s 9y **SW8260D**

Parame,er	Res(l,s	bOQ3Cb	Db	Unt,s
1c[-Dtuhloroe,hane	1[.5U	[5.0	] .50	(g3b
Surrogates				
1c[-Dtuhloroe,hane-D2 Vs(rr)	42.4	81-118		%
2-Bromofl(oro9enzene Vs(rr)	42	85-112		%
Tol(ene-d8 Vs(rr)	105	84-11[		%

Batch Information

Analy,tual Ba,uh: XMS[0560
Analy,tual Me,hod: Sx 8[70D
Ins,r(men,: Agtlen,] 840-] 5MS
Analys,: NRB
Analy,tual Da,e3Ttme: 1[3[[3[0[0 4:[7:00PM

Prep Ba,uh: X/ / 67] 5[
Prep Me,hod: Sx 5060B
Prep Da,e3Ttme: 1[3[[3[0[0 7:00:00PM
Prep Int,tal x ,.3Xol.: 5 mb
Prep Ei ,rau, Xol: 5 mb

Prtn, Da,e: 013l13[0[1 6:25:2[PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [VXX36752]
Blank Spike Lab ID: 1596491
Date Analyzed: 12/22/2020 18:15

Spike Duplicate ID: LCSD for HBN 1209876 [VXX36752]
Spike Duplicate Lab ID: 1596492
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876003

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2-Dichloroethane	30	25.8	86	30	26.3	88	(73-128)	1.80	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	89.7	90	30	89.9	90	(81-118)	0.17	
4-Bromofluorobenzene (surr)	30	91.8	92	30	91.3	91	(85-114)	0.50	
Toluene-d8 (surr)	30	104	104	30	105	105	(89-112)	0.72	

Batch Information

Analytical Batch: **VMS20590**
Analytical Method: **SW8260D**
Instrument: **Agilent 78- 0N75MS**
Analyst: **RXB**

Prep Batch: **V3396752**
Prep Method: **SW5090B**
Prep Date/Time: **12/22/2020 18:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1815085 [VXX/36757]
Blank Lab ID: 1596606

Ma,rti : x a,mr WQ(rfaumscffEs. ro(nGd

4 2 for QaC Slmp:
1e09876001s1e0987600es1e09876003s1e09876006

) mp(l,p bR **SW8260D-SIM**

QaraCmmr	) mp(l,p	LU4 /2 L	DL	y nt,p
1seFDtbroCom,- anm	0E0e50y	0E0500	0E01e5	(h/L
Surrogates				
gFBroCofl(orobmn%mmWp(rrd	99E3	85P1g		z
Tol(mnmPG8 Wp(rrd	98	89P1e		z

Batch Information

AnalR,tual Ba,u- : VMQe053e
AnalR,tual Mm,- oG: Qx 8e60DRQlM
Inp,r(Cmn,: VQA Ahtlmn, . 2 /MQ 7890B/5977A
AnalRp,: N) B
AnalR,tual Da,m/TtCm 1e/e6/e0e0 g:16:00OM

OrmS Ba,u- : VXX36757
OrmS Mm,- oG: Qx 5030B
OrmS Da,m/TtCm 1e/e6/e0e0 g:00:00OM
OrmS Int,tal x ,EVolE e5 CL
OrmS ci ,rau, Vol: e5 CL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [VXX36757]
Blank Spike Lab ID: 1596607
Da4e t nalAyez: 12d26d2020 16:31

Spike D/ pliua4e ID: LCSD for HBN 1209876 [VXX36757]
Spike D/ pliua4e Lab ID: 1596608
s a4iM x a4er W%/ rfaue(, ffE . ro/ nzG

g C for SaP pleR 1209876001(1209876002(1209876003(1209876006

c eR/ l4RbA **SW8260D-SIM**

	Blank Spike W%dLG			Spike D/ pliua4e W%dLG					
) araP e4er	Spike	c eR/ l4	c eu WhG	Spike	c eR/ l4	c eu WhG	CL	c) D WhG	c) D CL
1(2D)ibroP oe4 ane	0E2	0E195	97	0E2	0E198	99	W77C121 G	1E<0	W 20 G
Surrogates									
<B broP ofl/ orobenyene W%/ rrG	30	95E6	96	30	96E<	96	W85C11< G	0EB8	W 20 G
Tol/ eneQ28 W%/ rrG	30	96E5	97	30	98E3	98	W89C112 G	1EB0	W 20 G

Batch Information

t nalA4ual Ba4u- : **VMS20532**
t nalA4ual s e4 oz: **SW8260D-SIM**
InR4/ P en4 **VSA Agilent GC/MS 7890B/5977A**
t nalAR4 **NRB**

) rep Ba4u- : **VXX36757**
) rep s e4 oz: **SW5030B**
) rep Da4edTiP e: **12/26/2020 16:00**
Spike Ini4x 4dVolE 0E2 / %dL , M4rau4Vol: 25 P L
D/ pe Ini4x 4dVolE 0E2 / %dL , M4rau4Vol: 25 P L

) rin4Da4e: 01df1d2021 3:<5:50) s

Method Blank

Blank ID: MB for HBN 1815119 [VXX/36762]
Blank Lab ID: 1596712

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876002, 1209876003, 1209876004, 1209876005, 1209876006

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	104	50-150		%

Batch Information

Analytical Batch: VFC15475
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 12/28/2020 3:57:00PM

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [VXX36762]
Blank Spike Lab ID: 1596713
Date Analyzed: 12/28/2020 16:51

Spike Duplicate ID: LCSD for HBN 1209876 [VXX36762]
Spike Duplicate Lab ID: 1596714
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876002, 1209876003, 1209876004, 1209876005, 1209876006

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.969	97	1.00	0.982	98	(60-120)	1.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	107	107	0.0500	104	104	(50-150)	2.50	

Batch Information

Analytical Batch: **VFC15475**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX36762**
Prep Method: **SW5030B**
Prep Date/Time: **12/28/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1815119 [VXX/36762]
Blank Lab ID: 1596712

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876002, 1209876003, 1209876004, 1209876005, 1209876006

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	0.930	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	81.9	77-115		%

Batch Information

Analytical Batch: VFC15475
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 12/28/2020 3:57:00PM

Prep Batch: VXX36762
Prep Method: SW5030B
Prep Date/Time: 12/28/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 01/11/2021 3:45:58PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [VXX36762]
Blank Spike Lab ID: 1596715
Date Analyzed: 12/28/2020 16:33

Spike Duplicate ID: LCSD for HBN 1209876 [VXX36762]
Spike Duplicate Lab ID: 1596716
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876002, 1209876003, 1209876004, 1209876005, 1209876006

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	116	116	100	110	110	(80-120)	5.30	(< 20)
Ethylbenzene	100	116	116	100	108	108	(75-125)	6.80	(< 20)
o-Xylene	100	115	115	100	107	107	(80-120)	7.50	(< 20)
P & M -Xylene	200	230	115	200	214	107	(75-130)	7.00	(< 20)
Toluene	100	118	118	100	112	112	(75-120)	5.20	(< 20)
Xylenes (total)	300	345	115	300	321	107	(79-121)	7.20	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	92.8	93	50	101	101	(77-115)	8.00	

Batch Information

Analytical Batch: **VFC15475**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX36762**
Prep Method: **SW5030B**
Prep Date/Time: **12/28/2020 06:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1814964 (WFI/2900)
Blank Lab ID: 1596289

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876005

Results by **SM21 4500NO3-F**

Parameter	Results	LOQ/CL	DL	Units
Nitrate-N	0.100U	0.200	0.0500	mg/L
Nitrite-N	0.100U	0.200	0.0500	mg/L
Total Nitrate/Nitrite-N	0.0502J	0.200	0.0500	mg/L

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 12/18/2020 5:59:24PM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [WFI2900]
Blank Spike Lab ID: 1596288
Date Analyzed: 12/18/2020 17:57

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876005

Results by **SM21 4500NO3-F**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Nitrate-N	2.5	2.32	93	(70-130)
Nitrite-N	2.5	2.51	100	(90-110)
Total Nitrate/Nitrite-N	5	4.83	97	(90-110)

Batch Information

Analytical Batch: **WFI2900**
Analytical Method: **SM21 4500NO3-F**
Instrument: **Astoria segmented flow**
Analyst: **EWW**

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Matrix Spike Summary

Original Sample ID: 1206703002
MS Sample ID: 1596229 MS
MSD Sample ID: 1596230 MSD

Analysis Date: 12/18/2020 17:17
Analysis Date: 12/18/2020 17:19
Analysis Date: 12/18/2020 17:20
Matrix: Drinking Water

QC for Samples:

Results by **SM21 4500NO3-F**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	0.200U	5.00	5.64	113 *	5.00	5.70	114 *	90-110	1.20	(< 25)

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 12/18/2020 5:19:08PM

Print Date: 01/11/2021 3:46:08PM

Matrix Spike Summary

Original Sample ID: 1206738001
MS Sample ID: 1596233 MS
MSD Sample ID: 1596234 MSD

Analysis Date: 12/18/2020 18:02
Analysis Date: 12/18/2020 18:04
Analysis Date: 12/18/2020 18:06
Matrix: Drinking Water

QC for Samples: 1209876001, 1209876005

Results by **SM21 4500NO3-F**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Nitrate/Nitrite-N	0.100U	5.00	5.21	104	5.00	5.21	104	90-110	0.03	(< 25)

Batch Information

Analytical Batch: WFI2900
Analytical Method: SM21 4500NO3-F
Instrument: Astoria segmented flow
Analyst: EWW
Analytical Date/Time: 12/18/2020 6:04:39PM

Print Date: 01/11/2021 3:46:08PM

Method Blank

Blank ID: MB for HBN 1815024 [WXX/13575]
Blank Lab ID: 1596472

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876005

Results by **SM21 4500P-B,E**

Parameter	Results	LOQ/CL	DL	Units
Total Phosphorus	0.0200U	0.0400	0.0120	mg/L

Batch Information

Analytical Batch: WDA4915
Analytical Method: SM21 4500P-B,E
Instrument: Discrete Analyzer 2
Analyst: EWW
Analytical Date/Time: 12/23/2020 10:36:39AM

Prep Batch: WXX13575
Prep Method: SM21 4500P-B,E
Prep Date/Time: 12/22/2020 4:15:00PM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [V XX13575]
Blank Spike Lab ID: 1596473
Date Analyzed: 12/23/2020 10:37

Spike Duplicate ID: LCSD for HBN 1209876 [V XX13575]
Spike Duplicate Lab ID: 1596474
Matrix: V ater WSurface(, ffE . roundG

g C for SaP ples: 1209876001(1209876005

Results by **SM21 4500P-B,E**

	Blank Spike WP %LG			Spike Duplicate WP %LG					
) araP eter	Spike	Result	Rec WhG	Spike	Result	Rec WhG	CL	R) D WhG	R) D CL
Qotal) - osp- orus	0E2	0E204	102	0E2	0E195	98	W75h125 G	4E60	W 25 G

Batch Information

Analytical Batc- : **WDA4915**
Analytical Met- od: **SM21 4500P-B,E**
InstruP ent: **Discrete Analyzer 2**
Analyst: **EWW**

) rep Batc- : **WXX13575**
) rep Met- od: **SM21 4500P-B,E**
) rep Date/QP e: **12/22/2020 16:15**
Spike Init V tE TolE 0E2 P %L , xtract Tol: 25 P L
Dupe Init V tE TolE 0E2 P %L , xtract Tol: 25 P L

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t 907E562E2343 f 907E561E5301 wwwEusEs%sEcoP

Matrix Spike Summary

Original Sample ID: 1209876005
MS Sample ID: 1596475 MS
MSD Sample ID: 1596476 MSD

Analysis Date: 12/23/2020 10:51
Analysis Date: 12/23/2020 10:52
Analysis Date: 12/23/2020 10:53
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876005

Results by **SM21 4500P-B,E**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Total Phosphorus	0.0200U	0.200	.203	102	0.200	0.378	189 *	75-125	60.30 *	(< 25)

Batch Information

Analytical Batch: WDA4915
Analytical Method: SM21 4500P-B,E
Instrument: Discrete Analyzer 2
Analyst: EWW
Analytical Date/Time: 12/23/2020 10:52:16AM

Prep Batch: WXX13575
Prep Method: Total Phosphorus (W) Ext.
Prep Date/Time: 12/22/2020 4:15:00PM
Prep Initial Wt./Vol.: 25.00mL
Prep Extract Vol: 25.00mL

Print Date: 01/11/2021 3:46:13PM

Method Blank

Blank ID: MB for HBN 1814194 7[XX/134002
Blank] aL ID: 14b5818

MairxW[aipr (Curfacpt Eff.t Ground)

6 Q for CaS mpe:
1s, b805, , 1t 1s, b805, , 4

Rpeulie Ly **EPA 300.0**

ParaS pipr	Rpeulie	] O6 /Q]	D]	Unxie
Culfaip	, .1, , U	, .s, ,	, ., 4, ,	S g/]

Batch Information

Analyixcal Baich: [IQ51s5
Analyixcal Mpihod: EPA 3, , .,
IneiruS pni: b3, MpirohS coS maci IQ flpW
Analyei: A.A
Analyixcal Daip/TxS p: 1s/sb/s, s, s:s4:, , PM

PrpmBaich: [XX13400
PrpmMpihod: METHOD
PrpmDaip/TxS p: 1s/sb/s, s, 1, :, , :, , AM
PrpmInxixal [i./Vol.: 1, S]
PrpmEWiraci Vol: 1, S]

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [MXX13] 77b
Blank Spike La5 ID: 1] 96819
Date Analyzed: 12/29/2020 14:43

x atriW Mater (Surface, Eff., Ground)

QC for Samples: 1209876001, 120987600]

Results 5y **EPA 300.0**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Sulfate	]	] .11	102	(90-110)

Batch Information

Analytical Batch: **WIC6126**
Analytical x ethod: **EPA 300.0**
Instrument: **930 Metrohm compact IC flex**
Analyst: **A.A**

Prep Batch: **WXX13577**
Prep x ethod: **METHOD**
Prep Date/Time: **12/29/2020 10:00**
Spike Init Mt./Vol.:] mg/L EWtract Vol: 10 mL
Dupe Init Mt./Vol.: EWtract Vol:

SGS North America Inc.
200 Mest Potter Drive Anchorage, AK 9]] 18
t 907.] 62.2343 f 907.] 61.] 301 www.us.sgs.com
x em5er of SGS Group

Matrix Spike Summary

Original Sample ID: 1596821
MS Sample ID: 1596822 MS
MSD Sample ID:

Analysis Date: 12/29/2020 18:12
Analysis Date: 12/29/2020 18:31
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876005

Results by **EPA 300.0**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Sulfate	2.23	5.00	7.07	97				90-110		

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: A.A
Analytical Date/Time: 12/29/2020 6:31:07PM

Prep Batch: WXX13577
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 12/29/2020 10:00:00AM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

Print Date: 01/11/2021 3:46:19PM

Matrix Spike Summary

Original Sample ID: 1596823
MS Sample ID: 1596824 MS
MSD Sample ID:

Analysis Date: 12/29/2020 21:02
Analysis Date: 12/29/2020 21:21
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209876001, 1209876005

Results by **EPA 300.0**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Sulfate	1.93	5.00	6.8	98				90-110		

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: A.A
Analytical Date/Time: 12/29/2020 9:21:40PM

Prep Batch: WXX13577
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 12/29/2020 10:00:00AM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Method Blank

Blank ID: MB for HBN 1815008 [XXX/44331]
Blank Lab ID: 1596415

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876002, 1209876003, 1209876005

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	92.7	60-120		%

Batch Information

Analytical Batch: XFC15834
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 12/28/2020 4:58:00PM

Prep Batch: XXX44331
Prep Method: SW3520C
Prep Date/Time: 12/22/2020 4:15:50PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Member of SGS Group

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [VVVXX331]
Blank Spike Lab ID: 1596X16
Date Analyzed: 12/28/2020 17:08

Spike Duplicate ID: LCSD for HBN 1209876 [VVVXX331]
Spike Duplicate Lab ID: 1596X17
s atriM x ater WSurface(, ffE . roundG

g C for SaP pleR 1209876001(1209876002(1209876003(1209876005

4 eRultR by **AK102**

	Blank Spike WP %LG			Spike Duplicate WP %LG					
) araP eter	Spike	4 eRult	4 ec WhG	Spike	4 eRult	4 ec WhG	CL	4) D WhG	4) D CL
DieRel 4 an%e Qr%anicR	20	20E6	103	20	19E9	100	W75C125 G	3E30	W 20 G
Surrogates									
5a AndroRtane WRurrG	0EX	102	102	0EX	10X	10X	W60C120 G	1E90	

Batch Information

Analytical Batc<: **XFC15834**
Analytical s et<od: **AK102**
InRtruP ent: **Agilent 7890B F**
AnalyRt: **IVM**

) rep Batc<: **XXX44331**
) rep s et<od: **SW3520C**
) rep Date/hiP e: **12/22/2020 16:15**
Spike Init x tEToIE 20 P %L , Mract Tol: 1 P L
Dupe Init x tEToIE 20 P %L , Mract Tol: 1 P L

S. S Nort< AP erica IncE
200 x eRt) otter Drive Anc<ora%e(AK 95518
t 907E562E23X3 f 907E561E5301 wwwEuRER%REcoP

Method Blank

Blank ID: MB for HBN 1815008 [XXX/44331]
Blank Lab ID: 1596415

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209876001, 1209876002, 1209876003, 1209876005

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.250U	0.500	0.150	mg/L
Surrogates				
nA riacontaneAd62 (surr)	98.4	60A120		%

Batch Information

hnalytical BatcF: XKC15834
hnalytical MetFod: hV103
Instrument: hgilent 7890B K
hnalyst: ITM
hnalytical Date/- ime: 12/28/2020 4:58:00PM

Prep BatcF: XXX44331
Prep MetFod: SW3520C
Prep Date/- ime: 12/22/2020 4:15:50PM
Prep Initial Wt./Tol.: 250 mL
Prep Extract Tol: 1 mL

Print Date: 01/11/2021 3:46:27PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209876 [VVVXX331]
Blank Spike Lab ID: 1596X16
Date Analyzed: 12/28/2020 17:08

Spike Duplicate ID: LCSD for HBN 1209876 [VVVXX331]
Spike Duplicate Lab ID: 1596X17
s atriM x ater WSurface(, ffE . roundG

g C for SaP pleR 1209876001(1209876002(1209876003(1209876005

4 eRultR by **AK102**

	Blank Spike WP %LG			Spike Duplicate WP %LG					
) araP eter	Spike	4 eRult	4 ec WhG	Spike	4 eRult	4 ec WhG	CL	4) D WhG	4) D CL
4 eRdual 4 an%e Qr%anicR	20	19E5	97	20	19E	96	W60C120 G	1E70	W 20 G
Surrogates									
nGriacontaneQ162 WRurrG	0EX	97E7	98	0EX	96EX	96	W60C120 G	1E30	

Batch Information

Analytical Batch: **XFC15823**
Analytical s ethod: **AK102**
InRtruP ent: **Agilent 4870B F**
AnalyRt: **I9V**

) rep Batch: **XXX33221**
) rep s ethod: **SM25W0C**
) rep Date/<iP e: **1WWWW0W0 16:15**
Spike Init x tE TolE 20 P %L , Mract Tol: 1 P L
Dupe Init x tE TolE 20 P %L , Mract Tol: 1 P L

Chain-of-Custody Report

Collection Organization: Jacobs | **Chain-of-Custody:** 20ADOT-MAW07 | **Cooler ID:** | **NPDL Number:** NA
Project Number: MarkAir GW Monitoring | **Laboratory:** SGS | **Bill To:** Jacobs | **Report To:** Jacobs

	COC Sample ID	Loc ID	Collection Date	Collection Time	Sampler	Quantity	Container Type	Volume	Preservative	Matrix	Analyses Requested Group	QC	TAT (days)	Notes:
1AB	20MAW-MW12-GW	MW12	12/16/2020	0945	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	1AB	14 Day	DRO/RRO
1C	20MAW-MW12-GW	MW12	12/16/2020	0945	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A	1C	14 Day	Fe, Mn
1D	20MAW-MW12-GW	MW12	12/16/2020	0945	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0	1D	14 Day	Sulfate
1E	20MAW-MW12-GW	MW12	12/16/2020	0945	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E	1E	14 Day	NO2/NO3, Total Phos
2AB	20MAW-MW9-GW	MW9	12/16/2020	1230	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	2AB	14 Day	DRO/RRO
3AB	20MAW-MW17-GW	MW17	12/16/2020	1403	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	3AB	14 Day	DRO/RRO
	20MAW-MW5-GW	MW5	12/16/2020	1621	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	5AB	14 Day	DRO/RRO
	20MAW-MW5-GW	MW5	12/16/2020	1621	GW/KS	1	Poly	125mL	HNO3	GW	SW6020A	5C	14 Day	Fe, Mn
	20MAW-MW5-GW	MW5	12/16/2020	1621	GW/KS	1	Poly	60mL	<6°C	GW	EPA 300.0	5D	14 Day	Sulfate
	20MAW-MW5-GW	MW5	12/16/2020	1621	GW/KS	1	Poly	250mL	<6°C, H2SO4	GW	SM 4500 NO3-F, SM 4500-B,E	5E	14 Day	NO2/NO3, Total Phos

Special Instructions:

Relinquish By: Kari Hagen /Kari Hagen — Signature/Printed Name — 12/17/2020 1435 — Date/Time

Received By: Cecelia I Missik — Signature/Printed Name — 12/17/20 1520 — Date/Time

Relinquish By: Cecelia I Missik — Signature/Printed Name — 12/17/20 1600 — Date/Time

Received By: Michelle Albarran — Signature/Printed Name — 12:18:20 0847 — Date/Time

1209876

ANC: 1F, 1B 2B DSQ

Profile # 365105 JM

Chain-of-Custody Report

Collection Organization: Jacobs | **Chain-of-Custody:** 20ADOT-MAW06 | **Cooler ID:** | **NPDL Number:** NA
Project Number: MarkAir GW Monitoring | **Laboratory:** SGS | **Bill To:** Jacobs | **Report To:** Jacobs

COC Sample ID	Loc ID	Collection Date	Collection Time	Sampler	Quantity	Container Type	Volume	Preservative	Matrix	Analyses Requested Group	QC	TAT (days)	Notes:
20MAW-MW12-GW	MW12	12/16/2020	0945	GW/KS	12	VOA	40mL	<6°C; HCl	GW	AK101, SW8021, SW8260, SW8260 SIM, RSK 175	1FQ	14 Day	GRO, BTEX, 1,2-dichloroethane (EDC) Only, EDB, Methane
20MAW-MW9-GW	MW9	12/16/2020	1230	GW/KS	7	VOA	40mL	<6°C; HCl	GW	AK101, SW8021, SW8260, SW8260 SIM	2CI	14 Day	Limited Volume GRO, BTEX, EDC Only, EDB
20MAW-MW17-GW	MW17	12/16/2020	1403	GW/KS	9	VOA	40mL	<6°C; HCl	GW	AK101, SW8021, SW8260, SW8260 SIM	3CK	14 Day	GRO, BTEX, EDC Only, EDB
20MAW-MW17-GWA	MW17	12/16/2020	1403	GW/KS	3	VOA	40mL	<6°C; HCl	GW	SW8021	4AC	14 Day	BTEX Only
20MAW-MW5-GW	MW5	12/16/2020	1621	GW/KS	6	VOA	40mL	<6°C; HCl	GW	AK101, SW8021, RSK 175	5FK	14 Day	GRO, BTEX, Methane
20MAW-TB02	MAW-TB02	12/16/2020	0800	GW/KS	9	VOA	40mL	<6°C; HCl	W	AK101, SW8021, SW8260, SW8260 SIM	TB 6AT	14 Day	GRO, BTEX, EDC Only, EDB

Special Instructions:

Relinquish By: Kari Hagen /Kari Hagen 12/17/2020 1435 Relinquish By: Cecilia I Misik 12/17/20 1600
Signature/Printed Name Date/Time Signature/Printed Name Date/Time

Received By: Cecilia I Misik 12/17/20 1520 Received By: MA Michelle Albarran 12.18.20 0847
Signature/Printed Name Date/Time Signature/Printed Name Date/Time

ANC: IF, IB 2.8 052

e-Sample Receipt Form

SGS Workorder #: **1209876** | 1209876

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		N/A — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1F1B
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?		
N/A — **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 2.8 °C Therm. ID: D52
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
		N/A — ***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	**Preservative insufficent for sample MW17 added 2ml HCL from lot: LW09-0463-17-03**
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	**Bubbles in 1 vial from MW12 and 2 vials from MW9**
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	No	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

e-Sample Receipt Form FBK

SGS Workorder #:	1209876	1209876

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	Yes	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	Yes	
☐ **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 4.3 °C Therm. ID: D23
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?		
If <0°C, were sample containers ice free?		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	N/C	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were samples in good condition (no leaks/cracks/breakage)?	Yes	
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
For Rush/Short Hold Time, was RUSH/Short HT email sent?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

SGS Profile #		0

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1209876001-A	HCL to pH < 2	OK
1209876001-B	HCL to pH < 2	OK
1209876001-C	HNO3 to pH < 2	OK
1209876001-D	No Preservative Required	OK
1209876001-E	No Preservative Required	OK
1209876001-F	HCL to pH < 2	OK
1209876001-G	HCL to pH < 2	OK
1209876001-H	HCL to pH < 2	OK
1209876001-I	HCL to pH < 2	OK
1209876001-J	HCL to pH < 2	OK
1209876001-K	HCL to pH < 2	OK
1209876001-L	HCL to pH < 2	OK
1209876001-M	HCL to pH < 2	OK
1209876001-N	HCL to pH < 2	OK
1209876001-O	HCL to pH < 2	OK
1209876001-P	HCL to pH < 2	OK
1209876001-Q	HCL to pH < 2	OK
1209876002-A	HCL to pH < 2	OK
1209876002-B	HCL to pH < 2	OK
1209876002-C	HCL to pH < 2	OK
1209876002-D	HCL to pH < 2	OK
1209876002-E	HCL to pH < 2	OK
1209876002-F	HCL to pH < 2	OK
1209876002-G	HCL to pH < 2	OK
1209876002-H	HCL to pH < 2	OK
1209876002-I	HCL to pH < 2	OK
1209876003-A	HCL to pH < 2	OK
1209876003-B	HCL to pH < 2	OK
1209876003-C	HCL to pH < 2	OK
1209876003-D	HCL to pH < 2	OK
1209876003-E	HCL to pH < 2	OK
1209876003-F	HCL to pH < 2	OK
1209876003-G	HCL to pH < 2	OK
1209876003-H	HCL to pH < 2	OK
1209876003-I	HCL to pH < 2	OK
1209876003-J	HCL to pH < 2	OK
1209876003-K	HCL to pH < 2	OK
1209876004-A	HCL to pH < 2	OK
1209876004-B	HCL to pH < 2	OK
1209876004-C	HCL to pH < 2	OK
1209876005-A	HCL to pH < 2	OK
1209876005-B	HCL to pH < 2	OK
1209876005-C	HNO3 to pH < 2	OK
1209876005-D	No Preservative Required	OK
1209876005-E	H2SO4 to pH < 2	OK
1209876005-F	HCL to pH < 2	OK
1209876005-G	HCL to pH < 2	OK
1209876005-H	HCL to pH < 2	OK
1209876005-I	HCL to pH < 2	OK
1209876005-J	HCL to pH < 2	OK
1209876005-K	HCL to pH < 2	OK
1209876006-A	HCL to pH < 2	OK
1209876006-B	HCL to pH < 2	OK
1209876006-C	HCL to pH < 2	OK
1209876006-D	HCL to pH < 2	OK
1209876006-E	HCL to pH < 2	OK
1209876006-F	HCL to pH < 2	OK
1209876006-G	HCL to pH < 2	OK
1209876006-H	HCL to pH < 2	OK
1209876006-I	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

SGS North America, Inc

1209876

SGS Job Number: FA82049

Sampling Date: 12/16/20

Report to:

SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com

ATTN: Julie Shumway

Total number of pages in report: 17

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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EHS.US.CustomerCare@sgs.com

Sections:

1 2 3 4 5 6

Table of Contents

-1-

Sample Summary

SGS North America, Inc

1209876

Job No: FA82049

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
FA82049-1	12/16/20	09:45	12/24/20	AQ	Water	20MAW-MW12-GW
FA82049-2	12/16/20	16:21	12/24/20	AQ	Water	20MAW-MW5-GW

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: SGS North America, Inc **Job No:** FA82049

Site: 1209876 **Report Date** 12/31/2020 3:38:03

2 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 12/16/2020 and were received at SGS North America Inc - Orlando on 12/24/2020 properly preserved, at 5.2 Deg. C and intact. These Samples received an SGS Orlando job number of FA82049. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

GC Volatiles By Method RSKSOP-147/175

Matrix: AQ **Batch ID:** G1R153

All samples were analyzed within the recommended method holding time.

Sample(s) LA68517-2DUP, LA68517-3MS were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision,accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

_____

Ellen Pampel, LogIn/Safety (signature on file)

Summary of Hits

Job Number: FA82049
Account: SGS North America, Inc
Project: 1209876
Collected: 12/16/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA82049-1	**20MAW-MW12-GW**					
Methane		568	0.50	0.25	ug/l	RSKSOP-147/175
FA82049-2	**20MAW-MW5-GW**					
Methane		77.2	0.50	0.25	ug/l	RSKSOP-147/175

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	20MAW-MW12-GW		
Lab Sample ID:	FA82049-1	**Date Sampled:**	12/16/20
Matrix:	AQ - Water	**Date Received:**	12/24/20
Method:	RSKSOP-147/175	**Percent Solids:**	n/a
Project:	1209876		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1R4175.D	1	12/28/20 12:18	KB	n/a	n/a	G1R153
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	38.0 ml	5.0 ml	500 ul	25 Deg. C
Run #2				

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
74-82-8	Methane	568	0.50	0.25	0.16	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	20MAW-MW5-GW		
Lab Sample ID:	FA82049-2	**Date Sampled:**	12/16/20
Matrix:	AQ - Water	**Date Received:**	12/24/20
Method:	RSKSOP-147/175	**Percent Solids:**	n/a
Project:	1209876		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1R4176.D	1	12/28/20 12:25	KB	n/a	n/a	G1R153
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	38.0 ml	5.0 ml	500 ul	25 Deg. C
Run #2				

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
74-82-8	Methane	77.2	0.50	0.25	0.16	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

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Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

FA82049

SGS North America Inc.
CHAIN OF CUSTODY RECORD

Locations Nationwide
Alaska, Florida, New Jersey, Colorado, Texas, North Carolina, Virginia, Louisiana
www.us.sgs.com

CLIENT:	SGS North America Inc. - Alaska Division	SGS Reference:	SGS FL
CONTACT:	Julie Shumway	PHONE NO:	(907) 562-2343
PROJECT NAME:	1209876	PWSID#: / NPDL#:	
REPORTS TO:	Julie Shumway	E-MAIL:	Julie.Shumway@sgs.com, Env.Alaska.RefLabTeam@sgs.com
INVOICE TO:	SGS - Alaska	QUOTE #: / P.O. #:	1209876

Page 1 of 1

Additional Comments: All soils report out in dry weight unless

Preservative Used: HCl

TYPE: C = COMP, G = GRAB, MI = Multi Incremental Soils

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/ MATRIX CODE	# CONTAINERS	TYPE	Light Gases by RSK-175 (Methane only)				MS	MSD	SGS lab #	Location ID
1	20MAW-MW12-GW	12/16/2020	09:45:00	Water	3		X						1209876001	MW12
2	20MAW-MW5-GW	12/16/2020	16:21:00	Water	3		X						1209876005	MW5

Relinquished By: (1)	Date	Time	Received By:
J. Shumway	12/21/20	0908	Fx
Relinquished By: (2)	**Date**	**Time**	**Received By:**
FX			Maywlis Kgllu 12/24/20 16:30
Relinquished By: (3)	**Date**	**Time**	**Received By:**
Relinquished By: (4)	**Date**	**Time**	**Received For Laboratory By:**

DOD Project? YES JS NO

Report to DL (J Flags)? YES
If J- Report as DL/LOD/LOQ.

Data Deliverable Requirements: Level 2 + DV

Cooler ID:

Requested Turnaround Time and-or Special Instructions:

Temp Blank °C:

or Ambient [ ]

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

5.2

F088_COC_REF_LAB_20190411

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FA82049: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA82049 **Client:** SGS ALASKA **Project:** 1209876

Date / Time Received: 12/24/2020 10:30:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 148348012438

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (5.0);

Cooler Temps (Corrected) °C: Cooler 1: (5.2);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☑	☐
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: MAGALEAK Date: 12/24/2020 10:30:00 Reviewer: _____ Date: _____

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FA82049: Chain of Custody
Page 2 of 2

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA82049
Account: SGSAKA SGS North America, Inc
Project: 1209876

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
G1R153-MB	1R4159.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82049-1, FA82049-2

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.16	ug/l	

Blank Spike/Blank Spike Duplicate Summary

Job Number: FA82049
Account: SGSAKA SGS North America, Inc
Project: 1209876

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
G1R153-BS	1R4161.D	1	12/28/20	KB	n/a	n/a	G1R153
G1R153-BSD	1R4162.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82049-1, FA82049-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
74-82-8	Methane	108	105	97	111	103	6	62-139/30

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA82049
Account: SGSAKA SGS North America, Inc
Project: 1209876

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
LA68517-3MS	1R4172.D	1	12/28/20	KB	n/a	n/a	G1R153
LA68517-3	1R4165.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82049-1, FA82049-2

CAS No.	Compound	LA68517-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	0.59		108	132	122	62-139

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA82049
Account: SGSAKA SGS North America, Inc
Project: 1209876

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
LA68517-2DUP	1R4171.D	1	12/28/20	KB	n/a	n/a	G1R153
LA68517-2	1R4164.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82049-1, FA82049-2

CAS No.	Compound	LA68517-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	9.6		8.0		18	30

* = Outside of Control Limits.

Laboratory Report of Analysis

To: Jacobs Technology Inc.
794 University Ave #201
Fairbanks, AK 99709

Report Number: **1209879**

Client Project: **Brooks Fuel Site GW Monitoring**

Dear Kari Hagen,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson
2021.01.13
11:58:37 -09'00'

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

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Case Narrative

SGS Client: **Jacobs Technology Inc.**
SGS Project: **1209879**
Project Name/Site: **Brooks Fuel Site GW Monitoring**
Project Contact: **Kari Hagen**

Refer to sample receipt form for information on sample condition.

20MAW/BFS-EB (1209879005) PS

Light Gases by RSK 175 were analyzed by SGS of Orlando, FL.

LCS for HBN 1815125 [MXX/33912 (1596736) LCS

6020B- Metals LCS recoveries for iron and manganese do not meet QC criteria. The associated sample concentrations are less than the LOQ.

1209879005MS (1596737) MS

6020B- Metals MS recovery for manganese does not meet QC criteria. The post digestion spike was successful.

1209879005MSD (1596738) MSD

6020B- Metals MSD recoveries for iron and manganese do not meet QC criteria. The post digestion spike was successful.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8260D				
1209879003	20BFS-MW5-GW	VMS20530	4-Isopropyltoluene	SP
1209879003	20BFS-MW5-GW	VMS20530	n-Butylbenzene	SP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Print Date: 01/11/2021 3:48:05PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 DW Chemistry & Microbiology (Provisionally Certified as of 12/03/2020 for Turbidity by SM2130B, Copper & Mercury by EPA200.8 and Trihalomethanes by EPA 524.2) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
20BFS-MW2-GW	1209879001	12/17/2020	12/22/2020	Water (Surface, Eff., Ground)
20BFS-MW2-GWA	1209879002	12/17/2020	12/22/2020	Water (Surface, Eff., Ground)
20BFS-MW5-GW	1209879003	12/17/2020	12/22/2020	Water (Surface, Eff., Ground)
20BFS-MW8-GW	1209879004	12/17/2020	12/22/2020	Water (Surface, Eff., Ground)
20MAW/BFS-EB	1209879005	12/18/2020	12/22/2020	Water (Surface, Eff., Ground)
20MAW/BFS-TB01	1209879006	12/17/2020	12/22/2020	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS LV
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
AK101	Gasoline Range Organics (W)
EPA 300.0	Ion Chromatographic Analysis (W)
SW6020B	Metals by ICP-MS
SW8260D-SIM	SW8260-SIM (W)
SW8260D	Volatile Organic Compounds (W) FULL

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200 West Potter Drive, Anchorage, AK 99518
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Detectable Results Summary

Client Sample ID: **20BFS-MW2-GW**
Lab Sample ID: 1209879001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.376J	mg/L
	Residual Range Organics	0.306J	mg/L

Client Sample ID: **20BFS-MW2-GWA**
Lab Sample ID: 1209879002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.430J	mg/L
	Residual Range Organics	0.483J	mg/L

Client Sample ID: **20BFS-MW5-GW**
Lab Sample ID: 1209879003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	5.57	mg/L
	Residual Range Organics	1.38	mg/L
Volatile Fuels	Gasoline Range Organics	1.02	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	158	ug/L
	1,3,5-Trimethylbenzene	28.9	ug/L
	4-Isopropyltoluene	5.10	ug/L
	Benzene	308	ug/L
	Ethylbenzene	8.35	ug/L
	Isopropylbenzene (Cumene)	10.4	ug/L
	Naphthalene	18.3	ug/L
	n-Butylbenzene	4.48	ug/L
	n-Propylbenzene	12.6	ug/L
	o-Xylene	29.6	ug/L
	P & M -Xylene	106	ug/L
	sec-Butylbenzene	5.68	ug/L
	tert-Butylbenzene	0.502J	ug/L
	Xylenes (total)	136	ug/L

Client Sample ID: **20BFS-MW8-GW**
Lab Sample ID: 1209879004

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.20	mg/L
	Residual Range Organics	1.09	mg/L
Volatile Fuels	Gasoline Range Organics	0.0430J	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	0.383J	ug/L
	4-Isopropyltoluene	1.80	ug/L
	Naphthalene	0.979J	ug/L
	P & M -Xylene	2.08	ug/L
	sec-Butylbenzene	1.30	ug/L
	Xylenes (total)	2.08J	ug/L

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Detectable Results Summary

Client Sample ID: **20MAW/BFS-EB**
Lab Sample ID: 1209879005

	Parameter	Result	Units
Metals by ICP/MS	Manganese	0.761J	ug/L
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.0319J	ug/L
	2-Methylnaphthalene	0.0415J	ug/L
	Phenanthrene	0.0693	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.417J	mg/L
	Residual Range Organics	0.325J	mg/L

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Results of **20BFS-MW2-GW**

Client Sample ID: **20BFS-MW2-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879001
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.376	J	0.625	0.188	mg/L	1		01/06/21 18:01
Surrogates								
5a Androstane (surr)	95.7		50-150		%	1		01/06/21 18:01

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 01/06/21 18:01
Container ID: 1209879001-F

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.306	J	0.521	0.156	mg/L	1		01/06/21 18:01
Surrogates								
n-Triacontane-d62 (surr)	107		50-150		%	1		01/06/21 18:01

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 01/06/21 18:01
Container ID: 1209879001-F

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Results of **20BFS-MW2-GW**

Client Sample ID: **20BFS-MW2-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879001
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/23/20 18:08
Surrogates								
4-Bromofluorobenzene (surr)	102		50-150		%	1		12/23/20 18:08

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 18:08
Container ID: 1209879001-A

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20BFS-MW2-GW**

Client Sample ID: **20BFS-MW2-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879001
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
1,1,1-Trichloroethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,1,2,2-Tetrachloroethane	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
1,1,2-Trichloroethane	0.200 U		0.400	0.120	ug/L	1		12/22/20 21:55
1,1-Dichloroethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,1-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,1-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,2,3-Trichlorobenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,2,3-Trichloropropane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,2,4-Trichlorobenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,2,4-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,2-Dibromo-3-chloropropane	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		12/22/20 21:55
1,2-Dichlorobenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
1,2-Dichloropropane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,3-Dichlorobenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
1,3-Dichloropropane	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
1,4-Dichlorobenzene	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
2,2-Dichloropropane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
2-Butanone (MEK)	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
2-Chlorotoluene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
2-Hexanone	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
4-Chlorotoluene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
4-Isopropyltoluene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
4-Methyl-2-pentanone (MIBK)	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
Benzene	0.200 U		0.400	0.120	ug/L	1		12/22/20 21:55
Bromobenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Bromochloromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Bromodichloromethane	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
Bromoform	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Bromomethane	2.50 U		5.00	2.00	ug/L	1		12/22/20 21:55
Carbon disulfide	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
Carbon tetrachloride	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Chlorobenzene	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
Chloroethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55

Print Date: 01/11/2021 3:48:11PM

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Results of **20BFS-MW2-GW**

Client Sample ID: **20BFS-MW2-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879001
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Chloromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:55
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Freon-113	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Methylene chloride	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
Naphthalene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
o-Xylene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		12/22/20 21:55
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Styrene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Toluene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:55
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:55
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		12/22/20 21:55
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		12/22/20 21:55
Surrogates								
1,2-Dichloroethane-D4 (surr)	93.9		81-118		%	1		12/22/20 21:55
4-Bromofluorobenzene (surr)	93.9		85-114		%	1		12/22/20 21:55
Toluene-d8 (surr)	104		89-112		%	1		12/22/20 21:55

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Results of **20BFS-MW2-GW**

Client Sample ID: **20BFS-MW2-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879001
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20530
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/22/20 21:55
Container ID: 1209879001-A

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/20 18:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20BFS-MW2-GWA**

Client Sample ID: **20BFS-MW2-GWA**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879002
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.430	J	0.625	0.188	mg/L	1		01/06/21 18:11
Surrogates								
5a Androstane (surr)	97.5		50-150		%	1		01/06/21 18:11

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 01/06/21 18:11
Container ID: 1209879002-F

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.483	J	0.521	0.156	mg/L	1		01/06/21 18:11
Surrogates								
n-Triacontane-d62 (surr)	107		50-150		%	1		01/06/21 18:11

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 01/06/21 18:11
Container ID: 1209879002-F

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Results of **20BFS-MW2-GWA**

Client Sample ID: **20BFS-MW2-GWA**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879002
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/23/20 18:26
Surrogates								
4-Bromofluorobenzene (surr)	94.9		50-150		%	1		12/23/20 18:26

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 18:26
Container ID: 1209879002-A

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20BFS-MW2-GWA**

Client Sample ID: **20BFS-MW2-GWA**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879002
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:10
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:10
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		12/22/20 22:10
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:10
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		12/22/20 22:10
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:10
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:10
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:10
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:10
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:10
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:10
Benzene	0.200	U	0.400	0.120	ug/L	1		12/22/20 22:10
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:10
Bromoform	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
Bromomethane	2.50	U	5.00	2.00	ug/L	1		12/22/20 22:10
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:10
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:10
Chloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:10

Print Date: 01/11/2021 3:48:11PM

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Results of **20BFS-MW2-GWA**

Client Sample ID: **20BFS-MW2-GWA**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879002
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Chloromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		12/22/20 22:10
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		12/22/20 22:10
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Freon-113	5.00 U		10.0	3.10	ug/L	1		12/22/20 22:10
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Methylene chloride	5.00 U		10.0	3.10	ug/L	1		12/22/20 22:10
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		12/22/20 22:10
Naphthalene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
o-Xylene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		12/22/20 22:10
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Styrene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Toluene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:10
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		12/22/20 22:10
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		12/22/20 22:10
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		12/22/20 22:10
Surrogates								
1,2-Dichloroethane-D4 (surr)	93.7		81-118		%	1		12/22/20 22:10
4-Bromofluorobenzene (surr)	92.6		85-114		%	1		12/22/20 22:10
Toluene-d8 (surr)	104		89-112		%	1		12/22/20 22:10

Print Date: 01/11/2021 3:48:11PM

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Results of **20BFS-MW2-GWA**

Client Sample ID: **20BFS-MW2-GWA**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879002
Lab Project ID: 1209879

Collection Date: 12/17/20 09:50
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW2

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20530
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/22/20 22:10
Container ID: 1209879002-A

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/20 18:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20BFS-MW5-GW**

Client Sample ID: **20BFS-MW5-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879003
Lab Project ID: 1209879

Collection Date: 12/17/20 11:55
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	5.57		0.588	0.176	mg/L	1		01/06/21 18:21
Surrogates								
5a Androstane (surr)	98.8		50-150		%	1		01/06/21 18:21

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 01/06/21 18:21
Container ID: 1209879003-G

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.38		0.490	0.147	mg/L	1		01/06/21 18:21
Surrogates								
n-Triacontane-d62 (surr)	106		50-150		%	1		01/06/21 18:21

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 01/06/21 18:21
Container ID: 1209879003-G

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 01/11/2021 3:48:11PM

J flagging is activated

Results of **20BFS-MW5-GW**

Client Sample ID: **20BFS-MW5-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879003
Lab Project ID: 1209879

Collection Date: 12/17/20 11:55
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.02		0.500	0.155	mg/L	5		12/23/20 18:44
Surrogates								
4-Bromofluorobenzene (surr)	112		50-150		%	5		12/23/20 18:44

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 18:44
Container ID: 1209879003-A

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20BFS-MW5-GW**

Client Sample ID: **20BFS-MW5-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879003
Lab Project ID: 1209879

Collection Date: 12/17/20 11:55
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:25
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:25
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		12/22/20 22:25
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,2,4-Trimethylbenzene	158		1.00	0.310	ug/L	1		12/22/20 22:25
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:25
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		12/22/20 22:25
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:25
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,3,5-Trimethylbenzene	28.9		1.00	0.310	ug/L	1		12/22/20 22:25
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:25
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:25
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:25
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:25
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
4-Isopropyltoluene	5.10		1.00	0.310	ug/L	1		12/22/20 22:25
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:25
Benzene	308		4.00	1.20	ug/L	10		12/23/20 23:07
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:25
Bromoform	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
Bromomethane	2.50	U	5.00	2.00	ug/L	1		12/22/20 22:25
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:25
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:25
Chloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:25

Print Date: 01/11/2021 3:48:11PM

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Results of **20BFS-MW5-GW**

Client Sample ID: **20BFS-MW5-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879003
Lab Project ID: 1209879

Collection Date: 12/17/20 11:55
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
Chloromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		12/22/20 22:25
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		12/22/20 22:25
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
Ethylbenzene	8.35		1.00	0.310	ug/L	1		12/22/20 22:25
Freon-113	5.00 U		10.0	3.10	ug/L	1		12/22/20 22:25
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
Isopropylbenzene (Cumene)	10.4		1.00	0.310	ug/L	1		12/22/20 22:25
Methylene chloride	5.00 U		10.0	3.10	ug/L	1		12/22/20 22:25
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		12/22/20 22:25
Naphthalene	18.3		1.00	0.310	ug/L	1		12/22/20 22:25
n-Butylbenzene	4.48		1.00	0.310	ug/L	1		12/22/20 22:25
n-Propylbenzene	12.6		1.00	0.310	ug/L	1		12/22/20 22:25
o-Xylene	29.6		1.00	0.310	ug/L	1		12/22/20 22:25
P & M -Xylene	106		2.00	0.620	ug/L	1		12/22/20 22:25
sec-Butylbenzene	5.68		1.00	0.310	ug/L	1		12/22/20 22:25
Styrene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
tert-Butylbenzene	0.502 J		1.00	0.310	ug/L	1		12/22/20 22:25
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
Toluene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 22:25
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		12/22/20 22:25
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		12/22/20 22:25
Xylenes (total)	136		3.00	1.00	ug/L	1		12/22/20 22:25
Surrogates								
1,2-Dichloroethane-D4 (surr)	90.5		81-118		%	1		12/22/20 22:25
4-Bromofluorobenzene (surr)	91.7		85-114		%	1		12/22/20 22:25
Toluene-d8 (surr)	104		89-112		%	1		12/22/20 22:25

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Results of **20BFS-MW5-GW**

Client Sample ID: **20BFS-MW5-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879003
Lab Project ID: 1209879

Collection Date: 12/17/20 11:55
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW5

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20530
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/22/20 22:25
Container ID: 1209879003-A

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/20 18:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS20533
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/23/20 23:07
Container ID: 1209879003-C

Prep Batch: VXX36758
Prep Method: SW5030B
Prep Date/Time: 12/23/20 16:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20BFS-MW8-GW**

Client Sample ID: **20BFS-MW8-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879004
Lab Project ID: 1209879

Collection Date: 12/17/20 15:06
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.20		0.612	0.184	mg/L	1		01/06/21 18:31
Surrogates								
5a Androstane (surr)	98.9		50-150		%	1		01/06/21 18:31

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 01/06/21 18:31
Container ID: 1209879004-G

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.09		0.510	0.153	mg/L	1		01/06/21 18:31
Surrogates								
n-Triacontane-d62 (surr)	106		50-150		%	1		01/06/21 18:31

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 01/06/21 18:31
Container ID: 1209879004-G

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Results of **20BFS-MW8-GW**

Client Sample ID: **20BFS-MW8-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879004
Lab Project ID: 1209879

Collection Date: 12/17/20 15:06
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0430	J	0.100	0.0310	mg/L	1		12/23/20 19:02
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	1		12/23/20 19:02

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 19:02
Container ID: 1209879004-A

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20BFS-MW8-GW**

Client Sample ID: **20BFS-MW8-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879004
Lab Project ID: 1209879

Collection Date: 12/17/20 15:06
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		12/22/20 22:39
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,2,4-Trimethylbenzene	0.383	J	1.00	0.310	ug/L	1		12/23/20 18:59
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		12/22/20 22:39
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
4-Isopropyltoluene	1.80		1.00	0.310	ug/L	1		12/23/20 18:59
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
Benzene	0.200	U	0.400	0.120	ug/L	1		12/23/20 18:59
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
Bromoform	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Bromomethane	2.50	U	5.00	2.00	ug/L	1		12/22/20 22:39
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
Chloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39

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Results of **20BFS-MW8-GW**

Client Sample ID: **20BFS-MW8-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879004
Lab Project ID: 1209879

Collection Date: 12/17/20 15:06
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Chloromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 22:39
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Freon-113	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Methylene chloride	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
Naphthalene	0.979	J	1.00	0.310	ug/L	1		12/23/20 18:59
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
o-Xylene	0.500	U	1.00	0.310	ug/L	1		12/23/20 18:59
P & M -Xylene	2.08		2.00	0.620	ug/L	1		12/23/20 18:59
sec-Butylbenzene	1.30		1.00	0.310	ug/L	1		12/23/20 18:59
Styrene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Toluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 22:39
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		12/22/20 22:39
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		12/22/20 22:39
Xylenes (total)	2.08	J	3.00	1.00	ug/L	1		12/23/20 18:59
Surrogates								
1,2-Dichloroethane-D4 (surr)	92.2		81-118		%	1		12/22/20 22:39
4-Bromofluorobenzene (surr)	92		85-114		%	1		12/22/20 22:39
Toluene-d8 (surr)	104		89-112		%	1		12/22/20 22:39

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Results of **20BFS-MW8-GW**

Client Sample ID: **20BFS-MW8-GW**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879004
Lab Project ID: 1209879

Collection Date: 12/17/20 15:06
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MW8

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20533
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/23/20 18:59
Container ID: 1209879004-D

Prep Batch: VXX36758
Prep Method: SW5030B
Prep Date/Time: 12/23/20 16:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS20530
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/22/20 22:39
Container ID: 1209879004-A

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/20 18:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Iron	250	U	500	150	ug/L	5		12/30/20 14:39
Manganese	0.761	J	2.00	0.620	ug/L	5		12/30/20 14:39

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 12/30/20 14:39
Container ID: 1209879005-Q

Prep Batch: MXX33912
Prep Method: SW3010A
Prep Date/Time: 12/29/20 09:33
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Print Date: 01/11/2021 3:48:11PM

J flagging is activated

Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0319	J	0.0568	0.0170	ug/L	1		12/23/20 20:12
2-Methylnaphthalene	0.0415	J	0.0568	0.0170	ug/L	1		12/23/20 20:12
Acenaphthene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Acenaphthylene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Anthracene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Benzo(a)Anthracene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Benzo[a]pyrene	0.0114	U	0.0227	0.00705	ug/L	1		12/23/20 20:12
Benzo[b]Fluoranthene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Benzo[g,h,i]perylene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Benzo[k]fluoranthene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Chrysene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Dibenzo[a,h]anthracene	0.0114	U	0.0227	0.00705	ug/L	1		12/23/20 20:12
Fluoranthene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Fluorene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Indeno[1,2,3-c,d] pyrene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Naphthalene	0.0570	U	0.114	0.0352	ug/L	1		12/23/20 20:12
Phenanthrene	0.0693		0.0568	0.0170	ug/L	1		12/23/20 20:12
Pyrene	0.0284	U	0.0568	0.0170	ug/L	1		12/23/20 20:12
Surrogates								
2-Methylnaphthalene-d10 (surr)	58.7		37-78		%	1		12/23/20 20:12
Fluoranthene-d10 (surr)	72.6		24-116		%	1		12/23/20 20:12

Batch Information

Analytical Batch: XMS12453
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 12/23/20 20:12
Container ID: 1209879005-O

Prep Batch: XXX44333
Prep Method: SW3535A
Prep Date/Time: 12/23/20 08:55
Prep Initial Wt./Vol.: 220 mL
Prep Extract Vol: 1 mL

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Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.417	J	0.652	0.196	mg/L	1		01/06/21 18:41
Surrogates								
5a Androstane (surr)	95.9		50-150		%	1		01/06/21 18:41

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 01/06/21 18:41
Container ID: 1209879005-M

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.325	J	0.543	0.163	mg/L	1		01/06/21 18:41
Surrogates								
n-Triacontane-d62 (surr)	105		50-150		%	1		01/06/21 18:41

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 01/06/21 18:41
Container ID: 1209879005-M

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/20 15:44
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/23/20 17:50
Surrogates								
4-Bromofluorobenzene (surr)	98.5		50-150		%	1		12/23/20 17:50

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 17:50
Container ID: 1209879005-A

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 21:41
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 21:41
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		12/22/20 21:41
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		12/22/20 21:41
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		12/22/20 21:41
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 21:41
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		12/22/20 21:41
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 21:41
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 21:41
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		12/22/20 21:41
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 21:41
Benzene	0.200	U	0.400	0.120	ug/L	1		12/22/20 21:41
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 21:41
Bromoform	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
Bromomethane	2.50	U	5.00	2.00	ug/L	1		12/22/20 21:41
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		12/22/20 21:41
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 21:41
Chloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 21:41

Print Date: 01/11/2021 3:48:11PM

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Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Chloromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:41
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		12/22/20 21:41
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Freon-113	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:41
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Methylene chloride	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:41
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:41
Naphthalene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
o-Xylene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		12/22/20 21:41
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Styrene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Toluene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		12/22/20 21:41
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		12/22/20 21:41
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		12/22/20 21:41
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		12/22/20 21:41
Surrogates								
1,2-Dichloroethane-D4 (surr)	94.3		81-118		%	1		12/22/20 21:41
4-Bromofluorobenzene (surr)	94.7		85-114		%	1		12/22/20 21:41
Toluene-d8 (surr)	104		89-112		%	1		12/22/20 21:41

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Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20530
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/22/20 21:41
Container ID: 1209879005-A

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/20 18:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	0.00250	U	0.00500	0.00125	ug/L	1		12/26/20 20:04
Surrogates								
4-Bromofluorobenzene (surr)	89.9		85-114		%	1		12/26/20 20:04
Toluene-d8 (surr)	98.9		89-112		%	1		12/26/20 20:04

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 20:04
Container ID: 1209879005-C

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Results of **20MAW/BFS-EB**

Client Sample ID: **20MAW/BFS-EB**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879005
Lab Project ID: 1209879

Collection Date: 12/18/20 15:30
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW/BFS-EB

Results by **Waters Department**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Sulfate	0.100	U	0.200	0.0500	mg/L	1		12/29/20 17:53

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Analyst: A.A
Analytical Date/Time: 12/29/20 17:53
Container ID: 1209879005-R

Prep Batch: WXX13577
Prep Method: METHOD
Prep Date/Time: 12/29/20 10:00
Prep Initial Wt./Vol.: 10 mL
Prep Extract Vol: 10 mL

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Results of **20MAW/BFS-TB01**

Client Sample ID: **20MAW/BFS-TB01**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879006
Lab Project ID: 1209879

Collection Date: 12/17/20 08:00
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		12/23/20 16:02
Surrogates								
4-Bromofluorobenzene (surr)	101		50-150		%	1		12/23/20 16:02

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 12/23/20 16:02
Container ID: 1209879006-A

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW/BFS-TB01**

Client Sample ID: **20MAW/BFS-TB01**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879006
Lab Project ID: 1209879

Collection Date: 12/17/20 08:00
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		12/22/20 20:42
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		12/22/20 20:42
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
Benzene	0.200	U	0.400	0.120	ug/L	1		12/22/20 20:42
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
Bromoform	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Bromomethane	2.50	U	5.00	2.00	ug/L	1		12/22/20 20:42
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
Chloroethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42

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J flagging is activated

Results of **20MAW/BFS-TB01**

Client Sample ID: **20MAW/BFS-TB01**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879006
Lab Project ID: 1209879

Collection Date: 12/17/20 08:00
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Chloromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		12/22/20 20:42
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Freon-113	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Methylene chloride	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
Naphthalene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
o-Xylene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		12/22/20 20:42
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Styrene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Toluene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		12/22/20 20:42
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		12/22/20 20:42
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		12/22/20 20:42
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		12/22/20 20:42
Surrogates								
1,2-Dichloroethane-D4 (surr)	92.7		81-118		%	1		12/22/20 20:42
4-Bromofluorobenzene (surr)	94		85-114		%	1		12/22/20 20:42
Toluene-d8 (surr)	104		89-112		%	1		12/22/20 20:42

Print Date: 01/11/2021 3:48:11PM

J flagging is activated

Results of **20MAW/BFS-TB01**

Client Sample ID: **20MAW/BFS-TB01**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879006
Lab Project ID: 1209879

Collection Date: 12/17/20 08:00
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS20530
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 12/22/20 20:42
Container ID: 1209879006-A

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/20 18:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **20MAW/BFS-TB01**

Client Sample ID: **20MAW/BFS-TB01**
Client Project ID: **Brooks Fuel Site GW Monitoring**
Lab Sample ID: 1209879006
Lab Project ID: 1209879

Collection Date: 12/17/20 08:00
Received Date: 12/22/20 10:32
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location: MAW-TB01

Results by **Volatile-SIM**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dibromoethane	0.00250	U	0.00500	0.00125	ug/L	1		12/26/20 17:48
Surrogates								
4-Bromofluorobenzene (surr)	93.7		85-114		%	1		12/26/20 17:48
Toluene-d8 (surr)	98.5		89-112		%	1		12/26/20 17:48

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Analyst: NRB
Analytical Date/Time: 12/26/20 17:48
Container ID: 1209879006-C

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/20 16:00
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1815125 [MXX/33912]
Blank Lab ID: 1596735

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879005

Results by **SW6020B**

Parameter	Results	LOQ/CL	DL	Units
Iron	250U	500	150	ug/L
Manganese	1.00U	2.00	0.620	ug/L

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 12/30/2020 2:29:39PM

Prep Batch: MXX33912
Prep Method: SW3010A
Prep Date/Time: 12/29/2020 9:33:36AM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [MXX33912]
Blank Spike Lab ID: 1596736
Date Analyzed: 12/30/2020 14:34

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879005

Results by **SW6020B**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)		CL
Iron	5000	5970	119	*	(87-118)
Manganese	500	632	126	*	(87-115)

Batch Information

Analytical Batch: **MMS10977**
Analytical Method: **SW6020B**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **DMM**

Prep Batch: **MXX33912**
Prep Method: **SW3010A**
Prep Date/Time: **12/29/2020 09:33**
Spike Init Wt./Vol.: 5000 ug/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
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Matrix Spike Summary

Original Sample ID: 1209879005
MS Sample ID: 1596737 MS
MSD Sample ID: 1596738 MSD

QC for Samples: 1209879005

Analysis Date: 12/30/2020 14:39
Analysis Date: 12/30/2020 14:43
Analysis Date: 12/30/2020 14:48
Matrix: Water (Surface, Eff., Ground)

Results by **SW6020B**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Iron	250U	5000	5540	111	5000	6060	121 *	87-118	9.01	(< 20)
Manganese	0.761J	500	588	118 *	500	641	128 *	87-115	8.52	(< 20)

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 12/30/2020 2:43:57PM

Prep Batch: MXX33912
Prep Method: 3010 H20 Digest for Metals ICP-MS
Prep Date/Time: 12/29/2020 9:33:36AM
Prep Initial Wt./Vol.: 25.00mL
Prep Extract Vol: 25.00mL

Print Date: 01/11/2021 3:48:19PM

Bench Spike Summary

Original Sample ID: 1209879005
MS Sample ID: 1596739 BND
MSD Sample ID:

QC for Samples: 1209879005

Analysis Date: 12/30/2020 14:39
Analysis Date: 12/30/2020 14:53
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

Results by **SW6020B**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Iron	250U	25000	30000	120				75-125		
Manganese	0.761J	1250	1400	112				75-125		

Batch Information

Analytical Batch: MMS10977
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 12/30/2020 2:53:21PM

Prep Batch: MXX33912
Prep Method: 3010 H20 Digest for Metals ICP-MS
Prep Date/Time: 12/29/2020 9:33:36AM
Prep Initial Wt./Vol.: 25.00mL
Prep Extract Vol: 25.00mL

Print Date: 01/11/2021 3:48:19PM

Method Blank

Blank ID: MB for HBN 1815028 [VXX/36752]
Blank Lab ID: 1596490

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	2.00	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Method Blank

Blank ID: MB for HBN 1815028 [VXX/36752]
Blank Lab ID: 1596490

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	5.00U	10.0	3.10	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	91.6	81-118		%
4-Bromofluorobenzene (surr)	93.2	85-114		%
Toluene-d8 (surr)	105	89-112		%

Method Blank

Blank ID: MB for HBN 1815028 [VXX/36752]
Blank Lab ID: 1596490

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS20530
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 12/22/2020 6:01:00PM

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/2020 6:00:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Leaching Blank

Blank ID: LB for HBN 1814984 [TCLP/10943
Blank Lab ID: 1596325

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,1-Dichloroethene	25.0U	50.0	15.5	ug/L
1,2-Dichloroethane	12.5U	25.0	7.50	ug/L
1,4-Dichlorobenzene	12.5U	25.0	7.50	ug/L
2-Butanone (MEK)	250U	500	155	ug/L
Benzene	10.0U	20.0	6.00	ug/L
Carbon tetrachloride	25.0U	50.0	15.5	ug/L
Chlorobenzene	12.5U	25.0	7.50	ug/L
Chloroform	25.0U	50.0	15.5	ug/L
Hexachlorobutadiene	25.0U	50.0	15.5	ug/L
Tetrachloroethene	25.0U	50.0	15.5	ug/L
Trichloroethene	25.0U	50.0	15.5	ug/L
Vinyl chloride	25.0U	50.0	15.5	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	94.9	81-118		%
4-Bromofluorobenzene (surr)	94	85-114		%
Toluene-d8 (surr)	105	89-112		%

Batch Information

Analytical Batch: VMS20530
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 12/22/2020 9:26:00PM

Prep Batch: VXX36752
Prep Method: SW5030B
Prep Date/Time: 12/22/2020 6:00:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [VXX36752]
Blank Spike Lab ID: 1596491
Date Analyzed: 12/22/2020 18:15

Spike Duplicate ID: LCSD for HBN 1209879 [VXX36752]
Spike Duplicate Lab ID: 1596492
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	31.6	105	30	31.8	106	(78-124)	0.78	(< 20)
1,1,1-Trichloroethane	30	28.7	96	30	27.9	93	(74-131)	2.90	(< 20)
1,1,2,2-Tetrachloroethane	30	27.8	93	30	29.4	98	(71-121)	5.50	(< 20)
1,1,2-Trichloroethane	30	30.5	102	30	31.8	106	(80-119)	4.20	(< 20)
1,1-Dichloroethane	30	29.4	98	30	28.9	96	(77-125)	1.80	(< 20)
1,1-Dichloroethene	30	30.5	102	30	29.2	97	(71-131)	4.30	(< 20)
1,1-Dichloropropene	30	30.2	101	30	29.2	97	(79-125)	3.50	(< 20)
1,2,3-Trichlorobenzene	30	29.9	100	30	33.0	110	(69-129)	9.80	(< 20)
1,2,3-Trichloropropane	30	27.8	93	30	29.1	97	(73-122)	4.40	(< 20)
1,2,4-Trichlorobenzene	30	30.0	100	30	32.5	108	(69-130)	8.00	(< 20)
1,2,4-Trimethylbenzene	30	28.3	94	30	28.0	93	(79-124)	1.00	(< 20)
1,2-Dibromo-3-chloropropane	30	26.2	88	30	28.2	94	(62-128)	7.30	(< 20)
1,2-Dibromoethane	30	32.0	107	30	33.2	111	(77-121)	3.90	(< 20)
1,2-Dichlorobenzene	30	29.6	99	30	30.2	101	(80-119)	2.00	(< 20)
1,2-Dichloroethane	30	25.8	86	30	26.3	88	(73-128)	1.80	(< 20)
1,2-Dichloropropane	30	30.8	103	30	30.9	103	(78-122)	0.52	(< 20)
1,3,5-Trimethylbenzene	30	28.0	93	30	27.8	93	(75-124)	0.84	(< 20)
1,3-Dichlorobenzene	30	29.7	99	30	30.3	101	(80-119)	1.90	(< 20)
1,3-Dichloropropane	30	30.1	100	30	31.2	104	(80-119)	3.40	(< 20)
1,4-Dichlorobenzene	30	29.7	99	30	30.0	100	(79-118)	1.00	(< 20)
2,2-Dichloropropane	30	25.2	84	30	24.3	81	(60-139)	3.90	(< 20)
2-Butanone (MEK)	90	94.1	105	90	98.3	109	(56-143)	4.40	(< 20)
2-Chlorotoluene	30	29.2	97	30	28.9	97	(79-122)	0.87	(< 20)
2-Hexanone	90	84.4	94	90	90.7	101	(57-139)	7.20	(< 20)
4-Chlorotoluene	30	28.0	93	30	27.7	92	(78-122)	0.99	(< 20)
4-Isopropyltoluene	30	28.6	96	30	28.9	96	(77-127)	0.89	(< 20)
4-Methyl-2-pentanone (MIBK)	90	89.9	100	90	95.5	106	(67-130)	6.10	(< 20)
Benzene	30	31.3	104	30	31.4	105	(79-120)	0.31	(< 20)
Bromobenzene	30	30.3	101	30	30.2	101	(80-120)	0.30	(< 20)
Bromochloromethane	30	31.9	106	30	32.3	108	(78-123)	1.40	(< 20)
Bromodichloromethane	30	29.6	99	30	29.8	100	(79-125)	0.74	(< 20)
Bromoform	30	32.3	108	30	33.5	112	(66-130)	3.70	(< 20)
Bromomethane	30	26.3	88	30	24.8	83	(53-141)	5.90	(< 20)
Carbon disulfide	45	44.4	99	45	41.9	93	(64-133)	5.80	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [VXX36752]
Blank Spike Lab ID: 1596491
Date Analyzed: 12/22/2020 18:15

Spike Duplicate ID: LCSD for HBN 1209879 [VXX36752]
Spike Duplicate Lab ID: 1596492
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	30.3	101	30	29.4	98	(72-136)	3.10	(< 20)
Chlorobenzene	30	31.3	104	30	31.2	104	(82-118)	0.15	(< 20)
Chloroethane	30	29.9	100	30	25.8	86	(60-138)	14.60	(< 20)
Chloroform	30	29.4	98	30	29.0	97	(79-124)	1.40	(< 20)
Chloromethane	30	29.0	97	30	27.6	92	(50-139)	5.00	(< 20)
cis-1,2-Dichloroethene	30	31.7	106	30	31.3	104	(78-123)	1.30	(< 20)
cis-1,3-Dichloropropene	30	30.4	101	30	30.6	102	(75-124)	0.74	(< 20)
Dibromochloromethane	30	31.4	105	30	32.3	108	(74-126)	2.90	(< 20)
Dibromomethane	30	29.9	100	30	30.8	103	(79-123)	2.70	(< 20)
Dichlorodifluoromethane	30	30.3	101	30	28.8	96	(32-152)	5.00	(< 20)
Ethylbenzene	30	31.6	105	30	30.9	103	(79-121)	2.10	(< 20)
Freon-113	45	45.3	101	45	43.5	97	(70-136)	3.90	(< 20)
Hexachlorobutadiene	30	29.3	98	30	28.0	93	(66-134)	4.70	(< 20)
Isopropylbenzene (Cumene)	30	30.8	103	30	30.6	102	(72-131)	0.81	(< 20)
Methylene chloride	30	30.0	100	30	29.9	100	(74-124)	0.27	(< 20)
Methyl-t-butyl ether	45	44.6	99	45	45.8	102	(71-124)	2.60	(< 20)
Naphthalene	30	27.9	93	30	30.9	103	(61-128)	10.30	(< 20)
n-Butylbenzene	30	28.2	94	30	28.6	95	(75-128)	1.20	(< 20)
n-Propylbenzene	30	28.2	94	30	28.2	94	(76-126)	0.06	(< 20)
o-Xylene	30	31.3	104	30	31.2	104	(78-122)	0.33	(< 20)
P & M -Xylene	60	62.7	104	60	61.9	103	(80-121)	1.20	(< 20)
sec-Butylbenzene	30	28.9	96	30	28.9	96	(77-126)	0.09	(< 20)
Styrene	30	31.1	104	30	31.1	104	(78-123)	0.12	(< 20)
tert-Butylbenzene	30	29.2	97	30	29.0	97	(78-124)	0.85	(< 20)
Tetrachloroethene	30	32.2	107	30	31.7	106	(74-129)	1.80	(< 20)
Toluene	30	30.6	102	30	30.6	102	(80-121)	0.12	(< 20)
trans-1,2-Dichloroethene	30	31.4	105	30	30.5	102	(75-124)	3.20	(< 20)
trans-1,3-Dichloropropene	30	28.7	96	30	29.6	99	(73-127)	3.00	(< 20)
Trichloroethene	30	30.8	103	30	30.0	100	(79-123)	2.50	(< 20)
Trichlorofluoromethane	30	29.8	100	30	28.2	94	(65-141)	5.50	(< 20)
Vinyl acetate	30	32.6	109	30	33.9	113	(54-146)	3.90	(< 20)
Vinyl chloride	30	29.0	97	30	27.5	92	(58-137)	5.40	(< 20)
Xylenes (total)	90	94.0	104	90	93.1	103	(79-121)	0.91	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [VXX36752]
Blank Spike Lab ID: 1596491
Date Analyzed: 12/22/2020 18:15

Spike Duplicate ID: LCSD for HBN 1209879 [VXX36752]
Spike Duplicate Lab ID: 1596492
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **SW8260D**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	89.7	90	30	89.9	90	(81-118)	0.17	
4-Bromofluorobenzene (surr)	30	91.8	92	30	91.3	91	(85-114)	0.50	
Toluene-d8 (surr)	30	104	104	30	105	105	(89-112)	0.72	

Batch Information

Analytical Batch: **VMS20530**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **NRB**

Prep Batch: **VXX36752**
Prep Method: **SW5030B**
Prep Date/Time: **12/22/2020 18:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1815085 [VXX/36757]
Blank Lab ID: 1596606

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879005, 1209879006

Results by **SW8260D-SIM**

Parameter	Results	LOQ/CL	DL	Units
1,2-Dibromoethane	0.00250U	0.00500	0.00125	ug/L
Surrogates				
4-Bromofluorobenzene (surr)	99.3	85-114		%
Toluene-d8 (surr)	98	89-112		%

Batch Information

Analytical Batch: VMS20532
Analytical Method: SW8260D-SIM
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: NRB
Analytical Date/Time: 12/26/2020 4:16:00PM

Prep Batch: VXX36757
Prep Method: SW5030B
Prep Date/Time: 12/26/2020 4:00:00PM
Prep Initial Wt./Vol.: 25 mL
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [VXX36757]
Blank Spike Lab ID: 1596607
Date Analyzed: 12/26/2020 16:31

Spike Duplicate ID: LCSD for HBN 1209879 [VXX36757]
Spike Duplicate Lab ID: 1596608
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879005, 1209879006

Results by **SW8260D-SIM**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2-Dibromoethane	0.2	0.195	97	0.2	0.198	99	(77-121)	1.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	30	95.6	96	30	96.4	96	(85-114)	0.88	(< 20)
Toluene-d8 (surr)	30	96.5	97	30	98.3	98	(89-112)	1.80	(< 20)

Batch Information

Analytical Batch: **VMS20532**
Analytical Method: **SW8260D-SIM**
Instrument: **VSA Agilent GC/MS 7890B/5977A**
Analyst: **NRB**

Prep Batch: **VXX36757**
Prep Method: **SW5030B**
Prep Date/Time: **12/26/2020 16:00**
Spike Init Wt./Vol.: 0.2 ug/L Extract Vol: 25 mL
Dupe Init Wt./Vol.: 0.2 ug/L Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1815094 [VXX/36758]
Blank Lab ID: 1596639

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879003, 1209879004

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	91.7	81-118		%
4-Bromofluorobenzene (surr)	92	85-114		%
Toluene-d8 (surr)	105	89-112		%

Batch Information

Analytical Batch: VMS20533
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 12/23/2020 4:03:00PM

Prep Batch: VXX36758
Prep Method: SW5030B
Prep Date/Time: 12/23/2020 4:00:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [VXX36758]
Blank Spike Lab ID: 1596640
Date Analyzed: 12/23/2020 16:18

Spike Duplicate ID: LCSD for HBN 1209879 [VXX36758]
Spike Duplicate Lab ID: 1596641
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879003, 1209879004

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2,4-Trimethylbenzene	30	28.3	94	30	29.0	97	(79-124)	2.20	(< 20)
4-Isopropyltoluene	30	29.1	97	30	30.2	101	(77-127)	3.70	(< 20)
Benzene	30	31.6	105	30	31.6	105	(79-120)	0.24	(< 20)
Naphthalene	30	27.5	92	30	31.6	105	(61-128)	14.00	(< 20)
o-Xylene	30	31.9	106	30	32.3	108	(78-122)	1.30	(< 20)
P & M -Xylene	60	63.4	106	60	64.6	108	(80-121)	1.80	(< 20)
sec-Butylbenzene	30	29.3	98	30	30.3	101	(77-126)	3.30	(< 20)
Xylenes (total)	90	95.3	106	90	96.9	108	(79-121)	1.60	(< 20)
Surrt f aœg									
1,2-Dichloroethane-D4 (surr)	30	88.9	89	30	89	89	(81-118)	0.14	
4-Bromofluorobenzene (surr)	30	90.6	91	30	90.7	91	(85-114)	0.10	
Toluene-d8 (surr)	30	105	105	30	106	106	(89-112)	1.00	

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Analytical Batch: **VMS20533**
Analytical Method: **SW8260D**
Instrument: **Af ileno7890-75MS**
Analyst: **NRB**

Prep Batch: **VXX36758**
Prep Method: **SW5030B**
Prep Date/Time: **12/23/2020 16:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1815114 [VXX/36761]
Blank Lab ID: 1596704

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	99.6	50-150		%

Batch Information

Analytical Batch: VFC15474
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 12/23/2020 12:02:00PM

Prep Batch: VXX36761
Prep Method: SW5030B
Prep Date/Time: 12/23/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [VXX36761]
Blank Spike Lab ID: 1596705
Date Analyzed: 12/23/2020 12:56

Spike Duplicate ID: LCSD for HBN 1209879 [VXX36761]
Spike Duplicate Lab ID: 1596706
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879001, 1209879002, 1209879003, 1209879004, 1209879005, 1209879006

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.01	101	1.00	0.991	99	(60-120)	2.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	106	106	0.0500	103	103	(50-150)	2.80	

Batch Information

Analytical Batch: **VFC15474**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX36761**
Prep Method: **SW5030B**
Prep Date/Time: **12/23/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1815125 [X / / 3195]] L
Blank ba6 ID: 157Q818

CS for map els0:
1t i 78] 7i i 5

MaxrW: X axsr umcrfa, sE. ffGEd rocn) R

y s0clx0 6U EPA 300.0

garap sxsr	y s0clx0	bP C3Sb	Db	OnW0
mclfaxs	i G3i i O	i G1i i	i G5i i	p A3b

Batch Information

hnalUxWal Bax T: X ISQ1t Q
hnalUxWal MsxTo) : . gh 9i i G
In0xrcp snx 79i MsxroTp , op ea, xIS fls(
hnalU0x hG
hnalUxWal Daxs3Wp s: 1t 3 73 i t i t :t 5:i i gM

grse Bax T: X / / 195]]
grse MsxTo) : M. VHPD
grse Daxs3Wp s: 1t 3 73 i t i 1i :i i :i i hM
grse InWM X x34 olG 1i p b
grse . (xra, x4 ol: 1i p b

grWxDaxs: i 13113 i t 1 9:28:29gM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [WXX13577]
Blank Spike Lab ID: 1596819
Date Analyzed: 12/29/2020 14:43

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879005

Results by **EPA 300.0**

Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Sulfate	5	5.11	102	(90-110)

Batch Information

Analytical Batch: **WIC6126**
Analytical Method: **EPA 300.0**
Instrument: **930 Metrohm compact IC flex**
Analyst: **A.A**

Prep Batch: **WXX13577**
Prep Method: **METHOD**
Prep Date/Time: **12/29/2020 10:00**
Spike Init Wt./Vol.: 5 mg/L Extract Vol: 10 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1596821
MS Sample ID: 1596822 MS
MSD Sample ID:

QC for Samples: 1209879005

Analysis Date: 12/29/2020 18:12
Analysis Date: 12/29/2020 18:31
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

Results by **EPA 300.0**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Sulfate	2.23	5.00	7.07	97				90-110		

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: A.A
Analytical Date/Time: 12/29/2020 6:31:07PM

Prep Batch: WXX13577
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 12/29/2020 10:00:00AM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

Print Date: 01/11/2021 3:48:47PM

Matrix Spike Summary

Original Sample ID: 1596823
MS Sample ID: 1596824 MS
MSD Sample ID:

QC for Samples: 1209879005

Analysis Date: 12/29/2020 21:02
Analysis Date: 12/29/2020 21:21
Analysis Date:
Matrix: Water (Surface, Eff., Ground)

Results by **EPA 300.0**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Sulfate	1.93	5.00	6.8	98				90-110		

Batch Information

Analytical Batch: WIC6126
Analytical Method: EPA 300.0
Instrument: 930 Metrohm compact IC flex
Analyst: A.A
Analytical Date/Time: 12/29/2020 9:21:40PM

Prep Batch: WXX13577
Prep Method: EPA 300.0 Extraction Waters/Liquids
Prep Date/Time: 12/29/2020 10:00:00AM
Prep Initial Wt./Vol.: 10.00mL
Prep Extract Vol: 10.00mL

Print Date: 01/11/2021 3:48:47PM

SGS

Method Blank

Blank ID: MB for HBN 181541[VXXX/336667
Blank] aL ID: 15b[334

Ma2r,t : i a2mr xQWrfa(muc ffEu. roWrhGd

9 0 for QaC Slmp:
1e4b8sb445

) mpW2p LR 8270D SIM LV (PAH)

QaraCm2mr	) mpW2p	] U9 /0]	D]	y n,2p
1PMm2gRnaSg2galmmm	4E4e54y	4E4544	4E4154	W/]
ePMm2gRnaSg2galmmm	4E4e54y	4E4544	4E4154	W/]
z (mnaSg2gmmm	4E4e54y	4E4544	4E4154	W/]
z (mnaSg2gRmmm	4E4e54y	4E4544	4E4154	W/]
z n2gra(mmm	4E4e54y	4E4544	4E4154	W/]
Bmn%oxadz n2gra(mmm	4E4e54y	4E4544	4E4154	W/]
Bmn%o\a7SRmmm	4E4144y	4E4e44	4E44[e4	W/]
Bmn%oVL7AlWbran2gmmm	4E4e54y	4E4544	4E4154	W/]
Bmn%oV ugu7SmrRmmm	4E4e54y	4E4544	4E4154	W/]
Bmn%oVk7flWbran2gmnm	4E4e54y	4E4544	4E4154	W/]
0 grRpmnm	4E4e54y	4E4544	4E4154	W/]
D,Lmn%oVaug7an2gra(mmm	4E4144y	4E4e44	4E44[e4	W/]
AlWbran2gmnm	4E4e54y	4E4544	4E4154	W/]
AlWbrmnm	4E4e54y	4E4544	4E4154	W/]
InGmnoVlueu6P(uG7SRmnm	4E4e54y	4E4544	4E4154	W/]
NaSg2galmnm	4E4544y	4E144	4E4614	W/]
Ogmnan2grmnm	4E4e54y	4E4544	4E4154	W/]
ORmnm	4E4e54y	4E4544	4E4154	W/]
Surrogates				
ePMm2gRnaSg2galmnmPG14 xpWrd	53E	6sR8		h
AlWbran2gmnmPG14 xpWrd	[sEs	e3P1[		h

Batch Information

znalR2(al Ba2(g: XMQ1e356
znalR2(al Mm2goG 8es4D QIM] F xOz Hd
Inp2WCmn2 QFz z - ,lmn2s84/5bs5 . 0 /MQ
znalRp2] z i
znalR2(al Da2rlK,Cm 1e/e6/e4e4 s:11:44OM

OrmS Ba2(g: XXX33666
OrmS Mm2goG Qi 6565z
OrmS Da2rlK,Cm 1e/e6/e4e4 8:55:e4z M
OrmS In,2al i 2ZFolE e54 C]
OrmS ct 2a(2Fol: 1 C]

Or,n2Da2n 41/11/e4e1 6:38:3bOM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [XXX44333]
Blank Spike Lab ID: 1596441
Date Analyzed: 12/23/2020 19:31

Spike Duplicate ID: LCSD for HBN 1209879 [XXX44333]
Spike Duplicate Lab ID: 1596442
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879005

Results by **8270D SIM LV (PAH)**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	2	1.17	58	2	1.26	63	(41-115)	7.50	(< 20)
2-Methylnaphthalene	2	1.18	59	2	1.25	63	(39-114)	6.10	(< 20)
Acenaphthene	2	1.19	59	2	1.30	65	(48-114)	9.00	(< 20)
Acenaphthylene	2	1.30	65	2	1.39	70	(35-121)	6.70	(< 20)
Anthracene	2	1.28	64	2	1.37	68	(53-119)	7.00	(< 20)
Benzo(a)Anthracene	2	1.23	62	2	1.35	68	(59-120)	9.20	(< 20)
Benzo[a]pyrene	2	1.43	72	2	1.55	78	(53-120)	8.30	(< 20)
Benzo[b]Fluoranthene	2	1.37	68	2	1.52	76	(53-126)	10.50	(< 20)
Benzo[g,h,i]perylene	2	1.45	72	2	1.56	78	(44-128)	7.60	(< 20)
Benzo[k]fluoranthene	2	1.40	70	2	1.50	75	(54-125)	7.00	(< 20)
Chrysene	2	1.36	68	2	1.47	74	(57-120)	8.30	(< 20)
Dibenzo[a,h]anthracene	2	1.40	70	2	1.49	75	(44-131)	6.30	(< 20)
Fluoranthene	2	1.38	69	2	1.53	76	(58-120)	10.20	(< 20)
Fluorene	2	1.28	64	2	1.40	70	(50-118)	8.60	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.49	75	2	1.61	80	(48-130)	7.50	(< 20)
Naphthalene	2	1.27	63	2	1.34	67	(43-114)	5.30	(< 20)
Phenanthrene	2	1.33	67	2	1.43	72	(53-115)	7.00	(< 20)
Pyrene	2	1.36	68	2	1.50	75	(53-121)	9.90	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2	53.5	54	2	59.7	60	(37-78)	11.00	
Fluoranthene-d10 (surr)	2	65.7	66	2	73.5	74	(24-116)	11.20	

Batch Information

Analytical Batch: **XMS12453**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **LAW**

Prep Batch: **XXX44333**
Prep Method: **SW3535A**
Prep Date/Time: **12/23/2020 08:55**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Print Date: 01/11/2021 3:48:52PM

Method Blank

Blank ID: MB for HBN 1815100 [XXX/44342]
Blank Lab ID: 1596663

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879001, 1209879002, 1209879003, 1209879004, 1209879005

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	97.4	60-120		%

Batch Information

Analytical Batch: XFC15839
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 1/6/2021 5:32:00PM

Prep Batch: XXX44342
Prep Method: SW3520C
Prep Date/Time: 12/28/2020 3:44:30PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 01/11/2021 3:48:54PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [VVVXX3X26
Blank Spike La] ID: 1b9555X
Date Analyzed: 01/05/2021 17:X1

Spike Duplicate ID: LCSD for HBN 1209879 [VVVXX3X26
Spike Duplicate La] ID: 1b9555b
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879001, 1209879002, 1209879003, 120987900X, 120987900b

Results] y **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range 4 rganics	20	19.3	95	20	18.b	92	(7bC12b)	X.20	(- 20)
Surrogates									
ba Androstane (surr)	0.X	107	107	0.X	105	105	(50C120)	1.00	

Batch Information

Analytical Batc<: **XFC15839**
Analytical Met<od: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **IVM**

Prep Batc<: **XXX44342**
Prep Met<od: **SW3520C**
Prep Date/hime: **12/28/2020 15:44**
Spike Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL
Dupe Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL

Method Blank

Blank ID: MB for HBN 1815100 [XXX/44342]
Blank Lab ID: 1596663

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1209879001, 1209879002, 1209879003, 1209879004, 1209879005

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.250U	0.500	0.150	mg/L
Surrogates				
nA riacontaneAd62 (surr)	105	60A120		%

Batch Information

hnalytical BatcF: XKC15839
hnalytical MetFod: hV103
Instrument: hgilent 7890B K
hnalyst: ITM
hnalytical Date/- ime: 1/6/2021 5:32:00PM

Prep BatcF: XXX44342
Prep MetFod: SW3520C
Prep Date/- ime: 12/28/2020 3:44:30PM
Prep Initial Wt./Tol.: 250 mL
Prep Extract Tol: 1 mL

Print Date: 01/11/2021 3:49:00PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1209879 [VVVXX3X26
Blank Spike La] ID: 1b9555X
Date Analyzed: 01/05/2021 17:X1

Spike Duplicate ID: LCSD for HBN 1209879 [VVVXX3X26
Spike Duplicate La] ID: 1b9555b
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1209879001, 1209879002, 1209879003, 120987900X, 120987900b

Results] y **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range 4 rganics	20	20.X	102	20	19.9	100	(50C120)	2.20	(- 20)
Surrogates									
nCriacontaneCl52 (surr)	0.X	103	103	0.X	102	102	(50C120)	0.55	

Batch Information

Analytical Batch: **XFC15823**
Analytical Method: **AK102**
Instrument: **Agilent 9830B F**
Analyst: **I7V**

Prep Batch: **XXXMM2M4**
Prep Method: **SW2540C**
Prep Date/<ime: **14/48/4040 15:MM**
Spike Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL
Dupe Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL

Print Date: 01/11/2021 3:X9:03PM

Chain-of-Custody Report

Collection Organization: Jacobs | **Chain-of-Custody:** 20ADOT-BFS01 | **Cooler ID:** | **NPDL Number:** NA
Project Number: Brooks Fuel Site GW Monitoring | **Laboratory:** SGS | **Bill To:** Jacobs | **Report To:** Jacobs

COC Sample ID	Loc ID	Collection Date	Collection Time	Sampler	Quantity	Container Type	Volume	Preservative	Matrix	Analyses Requested Group	QC	TAT (days)	Notes:
20BFS-MW2-GW (1AE)	MW2	12/17/2020	0950	GW/KS	5	VOA	40mL	<6°C; HCl	GW	AK101, SW8260		14 Day	Limited Volume GRO, VOCs
20BFS-MW2-GW (1F6)	MW2	12/17/2020	0950	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
20BFS-MW2-GWA (2AE)	MW2	12/17/2020	0950	GW/KS	5	VOA	40mL	<6°C; HCl	GW	AK101, SW8260		14 Day	Limited Volume GRO, VOCs
20BFS-MW2-GWA (2F6)	MW2	12/17/2020	0950	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
20BFS-MW5-GW (3AF)	MW5	12/17/2020	1155	GW/KS	6	VOA	40mL	<6°C; HCl	GW	AK101, SW8260		14 Day	GRO, VOCs
20BFS-MW5-GW (3GH)	MW5	12/17/2020	1155	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
20BFS-MW8-GW (4AF)	MW8	12/17/2020	1506	GW/KS	6	VOA	40mL	<6°C; HCl	GW	AK101, SW8260		14 Day	GRO, VOCs
20BFS-MW8-GW (4GH)	MW8	12/17/2020	1506	GW/KS	2	GA	250mL	<6°C; HCl	GW	AK102/103		14 Day	DRO/RRO
20MAW/BFS-EB (5AL)	MAW/BFS-EB	12/18/2020	1530	KS	12	VOA	40mL	<6°C; HCl	GW	AK101, SW8260, SW8260 SIM, RSK 175	EB	14 Day	GRO, VOCs, EDB, Methane
20MAW/BFS-EB (5MN)	MAW/BFS-EB	12/18/2020	1530	KS	2	GA	250mL	<6°C; HCl	GW	AK102/103	EB	14 Day	DRO/RRO
20MAW/BFS-EB (5OP)	MAW/BFS-EB	12/18/2020	1530	KS	2	GA	250mL	<6°C	GW	SW8270 SIM	EB	14 Day	PAHs
20MAW/BFS-EB (5Q)	MAW/BFS-EB	12/18/2020	1530	KS	1	Poly	125mL	HNO3	GW	SW6020A	EB	14 Day	Fe, Mn
20MAW/BFS-EB (5R)	MAW/BFS-EB	12/18/2020	1530	KS	1	Poly	60mL	<6°C	GW	EPA 300.0	EB	14 Day	Sulfate
20MAW/BFS-TB01 (6AI)	MAW-TB01	12/17/2020	0800	GW/KS	9	VOA	40mL	<6°C; HCl	W	AK101, SW8260, SW8260 SIM	TB	14 Day	GRO, VOCs, EDB

Special Instructions:

Relinquish By: Kari Hagen /Kari Hagen 12/21/2020 1530 Relinquish By: Jen Dawkins 12-21-20 1530
Signature/Printed Name Date/Time Signature/Printed Name Date/Time

Received By: Jen Dawkins 12-21-20 1606 Received By: Castilleja Kurs 12/22/20 10:32
Signature/Printed Name Date/Time Signature/Printed Name Date/Time

#365109 ND

1209879

TB=4.1°C

AWC TB-3.3 DZ1
CS-1FIB
Lynden

e-Sample Receipt Form FBK

SGS Workorder #:	1209879	1209879

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	Yes	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	Yes	
**Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 4.1 °C Therm. ID: D23
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?		
If <0°C, were sample containers ice free?		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	N/C	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were samples in good condition (no leaks/cracks/breakage)?	Yes	
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/C	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
For Rush/Short Hold Time, was RUSH/Short HT email sent?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

SGS Profile #		0

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1209879001-A	HCL to pH < 2	OK	1209879006-B	HCL to pH < 2	OK
1209879001-B	HCL to pH < 2	OK	1209879006-C	HCL to pH < 2	OK
1209879001-C	HCL to pH < 2	OK	1209879006-D	HCL to pH < 2	OK
1209879001-D	HCL to pH < 2	OK	1209879006-E	HCL to pH < 2	OK
1209879001-E	HCL to pH < 2	OK	1209879006-F	HCL to pH < 2	OK
1209879001-F	HCL to pH < 2	OK	1209879006-G	HCL to pH < 2	OK
1209879001-G	HCL to pH < 2	OK	1209879006-H	HCL to pH < 2	OK
1209879002-A	HCL to pH < 2	OK	1209879006-I	HCL to pH < 2	OK
1209879002-B	HCL to pH < 2	OK			
1209879002-C	HCL to pH < 2	OK			
1209879002-D	HCL to pH < 2	OK			
1209879002-E	HCL to pH < 2	OK			
1209879002-F	HCL to pH < 2	OK			
1209879002-G	HCL to pH < 2	OK			
1209879003-A	HCL to pH < 2	OK			
1209879003-B	HCL to pH < 2	OK			
1209879003-C	HCL to pH < 2	OK			
1209879003-D	HCL to pH < 2	OK			
1209879003-E	HCL to pH < 2	OK			
1209879003-F	HCL to pH < 2	OK			
1209879003-G	HCL to pH < 2	OK			
1209879003-H	HCL to pH < 2	OK			
1209879004-A	HCL to pH < 2	OK			
1209879004-B	HCL to pH < 2	OK			
1209879004-C	HCL to pH < 2	OK			
1209879004-D	HCL to pH < 2	OK			
1209879004-E	HCL to pH < 2	OK			
1209879004-F	HCL to pH < 2	OK			
1209879004-G	HCL to pH < 2	OK			
1209879004-H	HCL to pH < 2	OK			
1209879005-A	HCL to pH < 2	OK			
1209879005-B	HCL to pH < 2	OK			
1209879005-C	HCL to pH < 2	OK			
1209879005-D	HCL to pH < 2	OK			
1209879005-E	HCL to pH < 2	OK			
1209879005-F	HCL to pH < 2	OK			
1209879005-G	HCL to pH < 2	OK			
1209879005-H	HCL to pH < 2	OK			
1209879005-I	HCL to pH < 2	OK			
1209879005-J	HCL to pH < 2	OK			
1209879005-K	HCL to pH < 2	OK			
1209879005-L	HCL to pH < 2	OK			
1209879005-M	HCL to pH < 2	OK			
1209879005-N	HCL to pH < 2	OK			
1209879005-O	No Preservative Required	OK			
1209879005-P	No Preservative Required	OK			
1209879005-Q	HNO3 to pH < 2	OK			
1209879005-R	No Preservative Required	OK			
1209879006-A	HCL to pH < 2	OK			

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

SGS North America, Inc

1209879

SGS Job Number: FA82047

Sampling Date: 12/18/20

Report to:

SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com

ATTN: Julie Shumway

Total number of pages in report: **16**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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EHS.US.CustomerCare@sgs.com

Sections: 1 2 3 4 5 6

Table of Contents

-1-

Sample Summary

SGS North America, Inc

1209879

Job No: FA82047

Sample Number	Collected Date	Time By	Received	Matrix Code	Matrix Type	Client Sample ID
FA82047-1	12/18/20	15:30	12/24/20	AQ	Water	20MAW/BFS-EB

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: SGS North America, Inc **Job No:** FA82047

Site: 1209879 **Report Date** 12/31/2020 10:40:10

1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on 12/18/2020 and were received at SGS North America Inc - Orlando on 12/24/2020 properly preserved, at 2.2 Deg. C and intact. These Samples received an SGS Orlando job number of FA82047. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

GC Volatiles By Method RSKSOP-147/175

Matrix: AQ **Batch ID:** G1R153

All samples were analyzed within the recommended method holding time.

Sample(s) LA68517-2DUP, LA68517-3MS were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

_____

Ellen Pampel, LogIn/Safety (signature on file)

Summary of Hits

Job Number: FA82047
Account: SGS North America, Inc
Project: 1209879
Collected: 12/18/20

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA82047-1	**20MAW/BFS-EB**					
Methane		0.22 J	0.50	0.25	ug/l	RSKSOP-147/175

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	20MAW/BFS-EB		
Lab Sample ID:	FA82047-1	**Date Sampled:**	12/18/20
Matrix:	AQ - Water	**Date Received:**	12/24/20
Method:	RSKSOP-147/175	**Percent Solids:**	n/a
Project:	1209879		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	1R4174.D	1	12/28/20 12:09	KB	n/a	n/a	G1R153
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	38.0 ml	5.0 ml	500 ul	25 Deg. C
Run #2				

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
74-82-8	Methane	0.22	0.50	0.25	0.16	ug/l	J
74-84-0	Ethane	0.50 U	1.0	0.50	0.32	ug/l	
74-85-1	Ethene	0.50 U	1.0	0.50	0.43	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

5

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

FA82047

SGS North America Inc.
CHAIN OF CUSTODY RECORD

Locations Nationwide
Alaska Florida
New Jersey Colorado
Texas North Carolina
Virginia Louisiana
www.us.sgs.com

CLIENT:	SGS North America Inc. - Alaska Division			SGS Reference:	**SGS Orlando**
CONTACT:	Julie Shumway	PHONE NO:	(907) 562-2343	Additional Comments:	All soils report out in dry weight unless
PROJECT NAME:	1209879	PWSID#:			
		NPDL#:			
REPORTS TO: Julie Shumway		E-MAIL:	Julie.Shumway@sgs.com		
			Env.Alaska.RefLabTeam@sgs.com		
INVOICE TO:		QUOTE #:			
	SGS - Alaska	P.O. #:	1209879		

Page 1 of 1

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/ MATRIX CODE	# CONTAINERS	Preservative Used:	TYPE C = COMP G = GRAB MI = Multi Incremental Soils	Light Gases by RSK-175					MS	MSD	SGS lab #	Location ID
								HCl								
1	20MAW/BFS-EB	12/18/2020	15:30:00	Water	3		X	X							1209879005	MAW/BFS-EB

Relinquished By: (1)	Date	Time	Received By:	DOD Project? YES	Data Deliverable Requirements:
Relinquished By: (2)	Date	Time	Received By:	Report to DL (J Flags)? YES If J- Report as DL/LOD/LOQ.	Level 2 + SGS EDD
Relinquished By: (3)	Date	Time	Received By:	Cooler ID:	Requested Turnaround Time and-or Special Instructions:
Relinquished By: (4)	Date	Time	Received For Laboratory By:	Temp Blank °C: 2.2 or Ambient [ ]	Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

[X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

F088_COC_REF_LAB_20190411

FA82047: Chain of Custody
Page 1 of 2

SGS Sample Receipt Summary

Job Number: FA82047 **Client:** SGS ALASKA **Project:** 1209879

Date / Time Received: 12/24/2020 10:30:00 AM **Delivery Method:** FEDEX **Airbill #'s:** 148348012471

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 1

Cooler Temps (Raw Measured) °C: Cooler 1: (2.0);

Cooler Temps (Corrected) °C: Cooler 1: (2.2);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☑	☐
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: MAGALEAK Date: 12/24/2020 10:30:00 Reviewer: _____ Date: _____

5.1
5

FA82047: Chain of Custody
Page 2 of 2

QC Evaluation: DOD QSM5.x Limits

Job Number: FA82047
Account: SGS North America, Inc
Project: 1209879
Collected: 12/18/20

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
G1R153	RSKSOP-147/175						
G1R153-BS	74-82-8	Methane	BSP	REC	97	%	73-125
G1R153-BS	74-84-0	Ethane	BSP	REC	96	%	74-131
G1R153-BS	74-85-1	Ethene	BSP	REC	97	%	72-133
G1R153-BSD	74-82-8	Methane	BSD	REC	103	%	73-125
G1R153-BSD	74-82-8	Methane	BSD	RPD	6	%	30
G1R153-BSD	74-84-0	Ethane	BSD	REC	100	%	74-131
G1R153-BSD	74-84-0	Ethane	BSD	RPD	4	%	30
G1R153-BSD	74-85-1	Ethene	BSD	REC	102	%	72-133
G1R153-BSD	74-85-1	Ethene	BSD	RPD	5	%	30
LA68517-3MS*	74-82-8	Methane	MS	REC	122	%	73-125
LA68517-3MS*	74-84-0	Ethane	MS	REC	120	%	74-131
LA68517-3MS*	74-85-1	Ethene	MS	REC	121	%	72-133
LA68517-2DUP*	74-82-8	Methane	DUP	RPD	18	%	30
LA68517-2DUP*	74-84-0	Ethane	DUP	RPD	0	%	30
LA68517-2DUP*	74-85-1	Ethene	DUP	RPD	0	%	30

* Sample used for QC is not from job FA82047

GC Volatiles

6

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA82047
Account: SGSAKA SGS North America, Inc
Project: 1209879

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
G1R153-MB	1R4159.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82047-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.16	ug/l	
74-84-0	Ethane	ND	1.0	0.32	ug/l	
74-85-1	Ethene	ND	1.0	0.43	ug/l	

Blank Spike/Blank Spike Duplicate Summary

Job Number: FA82047
Account: SGSAKA SGS North America, Inc
Project: 1209879

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
G1R153-BS	1R4161.D	1	12/28/20	KB	n/a	n/a	G1R153
G1R153-BSD	1R4162.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82047-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	BSD ug/l	BSD %	RPD	Limits Rec/RPD
74-82-8	Methane	108	105	97	111	103	6	62-139/30
74-84-0	Ethane	219	210	96	219	100	4	67-141/30
74-85-1	Ethene	290	282	97	295	102	5	68-141/30

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA82047
Account: SGSAKA SGS North America, Inc
Project: 1209879

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
LA68517-3MS	1R4172.D	1	12/28/20	KB	n/a	n/a	G1R153
LA68517-3	1R4165.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82047-1

CAS No.	Compound	LA68517-3 ug/l	Q	Spike ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	0.59		108	132	122	62-139
74-84-0	Ethane	ND		219	263	120	67-141
74-85-1	Ethene	ND		290	352	121	68-141

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA82047
Account: SGSAKA SGS North America, Inc
Project: 1209879

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
LA68517-2DUP	1R4171.D	1	12/28/20	KB	n/a	n/a	G1R153
LA68517-2	1R4164.D	1	12/28/20	KB	n/a	n/a	G1R153

The QC reported here applies to the following samples: **Method:** RSKSOP-147/175

FA82047-1

CAS No.	Compound	LA68517-2 ug/l	Q	DUP ug/l	Q	RPD	Limits
74-82-8	Methane	9.6		8.0		18	30
74-84-0	Ethane	ND		ND		nc	30
74-85-1	Ethene	ND		ND		nc	30

* = Outside of Control Limits.

Attachment F-2

Genetic Analysis Results

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SITE LOGIC Report

QuantArray®-Petro Study

Contact: Guy Wade
Phone: 907-762-1022

Address: Jacobs
949 E. 36th Avenue
Suite 500
Anchorage, AK 99508

Email: guy.wade@jacobs.com

MI Identifier: 096RL

Report Date: 12/30/2020

Project: MarkAir Groundwater - D3414000, D3414000
Comments:

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The QuantArray®-Petro Approach

Comprehensive evaluation of biodegradation potential at petroleum impacted sites is inherently problematic due to two factors:

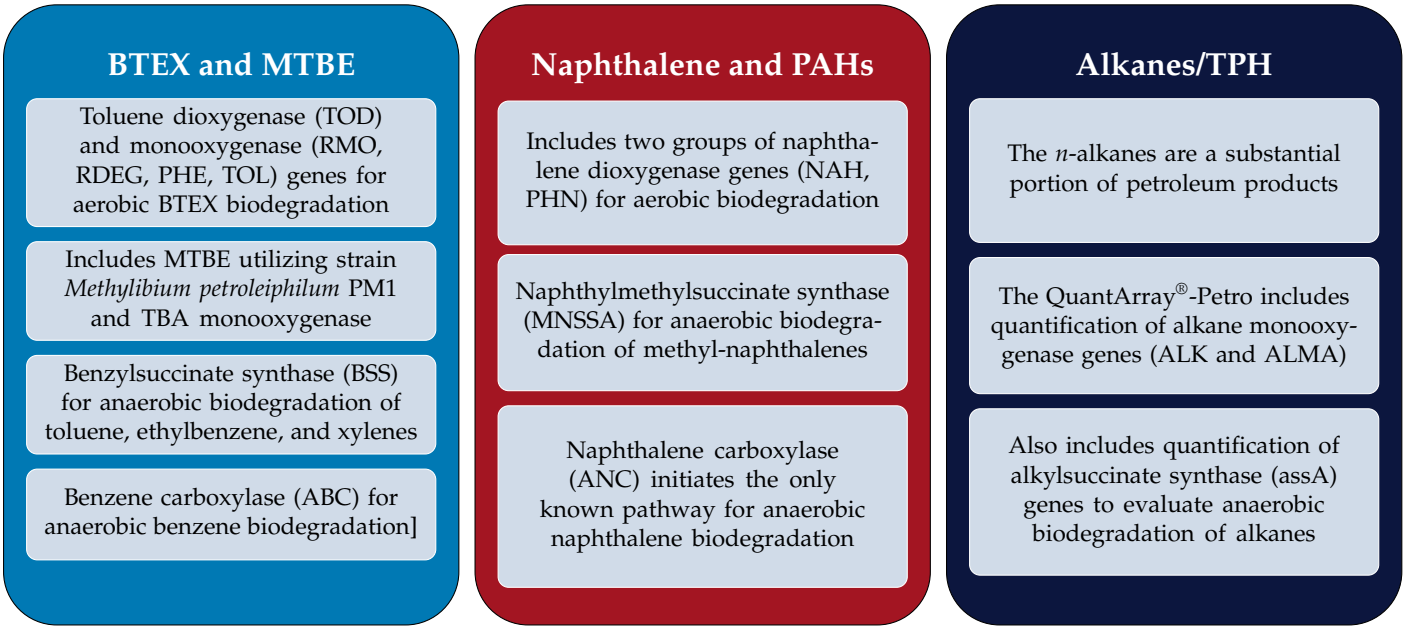
(1) Petroleum products are complex mixtures of hundreds of aliphatic, aromatic, cyclic, and heterocyclic compounds.

(2) Even for common classes of contaminants like benzene, toluene, ethylbenzene, and xylenes (BTEX), biodegradation can proceed by a multitude of pathways.

The QuantArray®-Petro has been designed to address both of these issues by providing the simultaneous quantification of the specific functional genes responsible for both aerobic and anaerobic biodegradation of BTEX, PAHs, and a variety of short and long chain alkanes.

Thus, when combined with chemical and geochemical groundwater monitoring programs, the QuantArray®-Petro allows site managers to simultaneously yet economically evaluate the potential for biodegradation of a spectrum of petroleum hydrocarbons through a multitude of aerobic and anaerobic pathways to give a much clearer and comprehensive view of contaminant biodegradation.

The QuantArray®-Petro is used to quantify specific microorganisms and functional genes to evaluate aerobic and anaerobic biodegradation of the following classes of compounds present in petroleum products:



How do QuantArrays® work?

The QuantArray®-Petro in many respects is a hybrid technology combining the highly parallel detection of microarrays with the accurate and precise quantification provided by qPCR into a single platform. The key to highly parallel qPCR reactions is the nanoliter fluidics platform for low volume, solution phase qPCR reactions.

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How are QuantArray® results reported?

One of the primary advantages of the QuantArray®-Petro is the simultaneous quantification of a broad spectrum of different microorganisms and key functional genes involved in a variety of pathways for hydrocarbon biodegradation. However, highly parallel quantification combined with various metabolic and cometabolic capabilities of different target organisms can complicate data presentation. Therefore, in addition to Summary Tables, QuantArray®-Petro results will be presented as Microbial Population Summary and Comparison Figures to aid in the data interpretation and subsequent evaluation of site management activities.

Types of Tables and Figures:

Microbial Population Summary	Figure presenting the concentrations of QuantArray®-Petro target gene concentrations (e.g. toluene dioxygenase) relative to typically observed values.
Summary Tables	Tables of target population concentrations grouped by biodegradation pathway and contaminant type.
Comparison Figures	Depending on the project, sample results can be presented to compare changes over time or examine differences in microbial populations along a transect of the dissolved plume.

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Results

Table 1: Summary of the QuantArray®-Petro results obtained for samples 20MAW-MW8-GW, 20MAW-MW10-GW, 20MAW-MW12-GW, and 20MAW-MW5-GW.

Sample Name Sample Date	20MAW-MW8-GW 12/15/2020	20MAW-MW10-GW 12/15/2020	20MAW-MW12-GW 12/16/2020	20MAW-MW5-GW 12/16/2020
Aerobic BTEX and MTBE	cells/mL	cells/mL	cells/mL	cells/mL
Toluene/Benzene Dioxygenase (TOD)	<5.00E+00	**2.43E+01**	<5.00E+00	<4.50E+00
Phenol Hydroxylase (PHE)	**5.07E+03**	**4.71E+04**	**2.28E+02**	<4.50E+00
Toluene 2 Monooxygenase/Phenol Hydroxylase (RDEG)	**2.70E+03**	**9.34E+04**	<5.00E+00	<4.50E+00
Toluene Ring Hydroxylating Monooxygenases (RMO)	**7.17E+03**	**5.09E+04**	**1.17E+02**	<4.50E+00
Xylene/Toluene Monooxygenase (TOL)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Ethylbenzene/Isopropylbenzene Dioxygenase (EDO)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Biphenyl/Isopropylbenzene Dioxygenase (BPH4)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Methylibium petroleiphilum PM1 (PM1)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
TBA Monooxygenase (TBA)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Aerobic PAHs and Alkanes				
Naphthalene Dioxygenase (NAH)	**5.80E+00**	<7.10E+00	<5.00E+00	<4.50E+00
Naphthalene-inducible Dioxygenase (NidA)	**3.99E+01**	<7.10E+00	<5.00E+00	<4.50E+00
Phenanthrene Dioxygenase (PHN)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Alkane Monooxygenase (ALK)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Alkane Monooxygenase (ALMA)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Anaerobic BTEX				
Benzoyl Coenzyme A Reductase (BCR)	**2.12E+03**	**9.37E+02**	**1.58E+03**	**2.13E+02**
Benzylsuccinate Synthase (BSS)	**6.40E+03**	**1.17E+04**	**3.80E+02**	**8.22E+01**
Benzene Carboxylase (ABC)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Anaerobic PAHs and Alkanes				
Naphthylmethylsuccinate Synthase (MNSSA)	**5.16E+03**	**1.33E+03**	**8.86E+02**	<4.50E+00
Naphthalene Carboxylase (ANC)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Alkylsuccinate Synthase (ASSA)	**3.90E+01**	**1.65E+02**	**6.86E+02**	<4.50E+00
Other				
Total Eubacteria (EBAC)	**2.87E+06**	**3.63E+07**	**1.01E+06**	**4.39E+05**
Sulfate Reducing Bacteria (APS)	**5.29E+04**	**4.09E+04**	**4.54E+04**	**3.49E+03**

Legend:
NA = Not Analyzed
I = Inhibited
NS = Not Sampled
< = Result Not Detected
J = Estimated Gene Copies Below PQL but Above LQL

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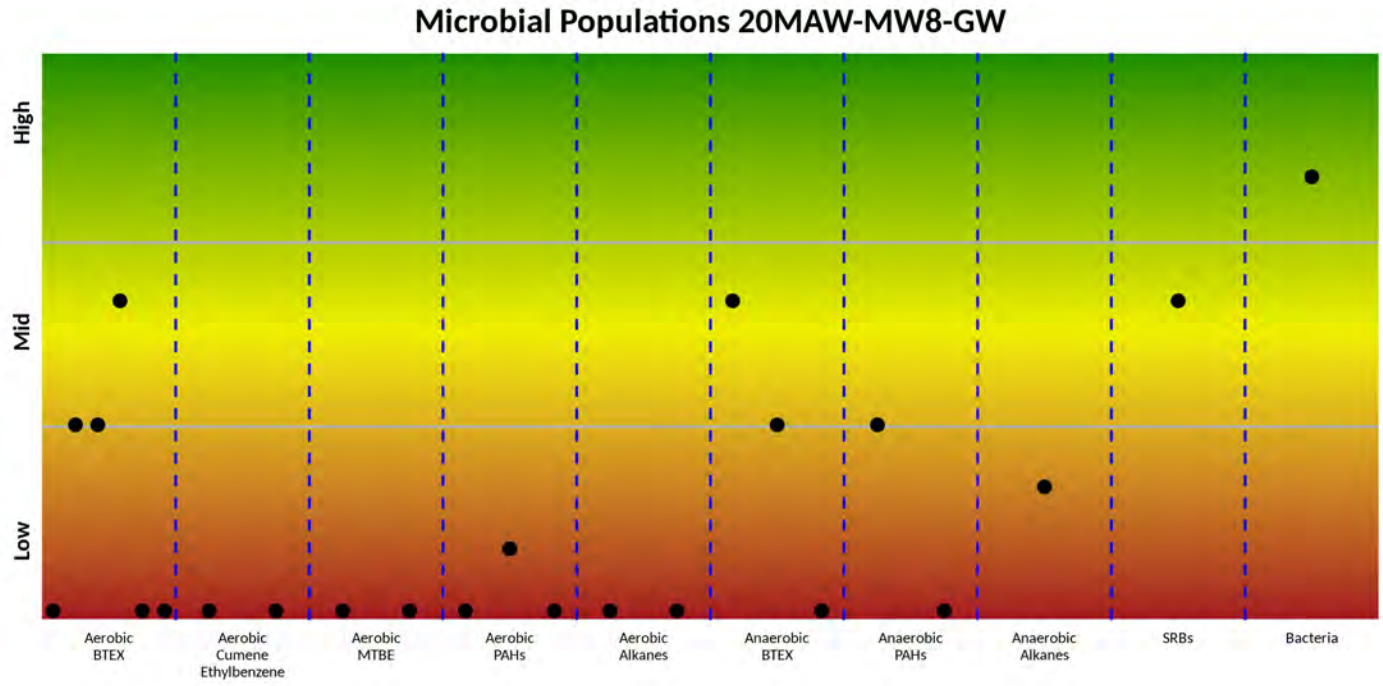

Figure 1: Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

Aerobic		Anaerobic	
BTEX	TOD, PHE, RDEG, RMO, TOL, EDO	BTEX	BCR, BSS, ABC
Cumene, Ethylbenzene	EDO, BPH4	Naphthalene/Methylnaphthalene	MNSSA, ANC
MTBE/TBA	PM1, TBA	Alkanes	assA
Naphthalene	NAH, NidA		
Phenanthrene	PHN		
Alkanes	ALK, ALMA		

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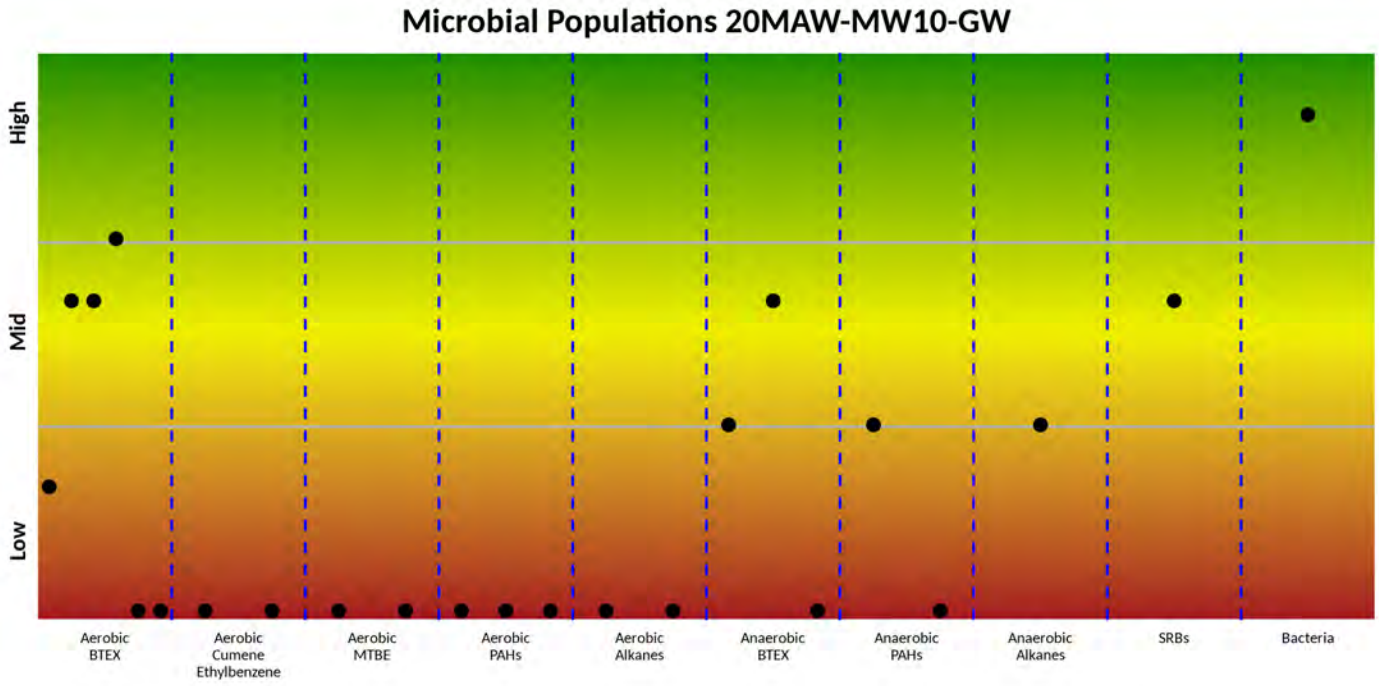

Figure 2: Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

Aerobic		Anaerobic	
BTEX	TOD, PHE, RDEG, RMO, TOL, EDO	BTEX	BCR, BSS, ABC
Cumene, Ethylbenzene	EDO, BPH4	Naphthalene/Methylnaphthalene	MNSSA, ANC
MTBE/TBA	PM1, TBA	Alkanes	assA
Naphthalene	NAH, NidA		
Phenanthrene	PHN		
Alkanes	ALK, ALMA		

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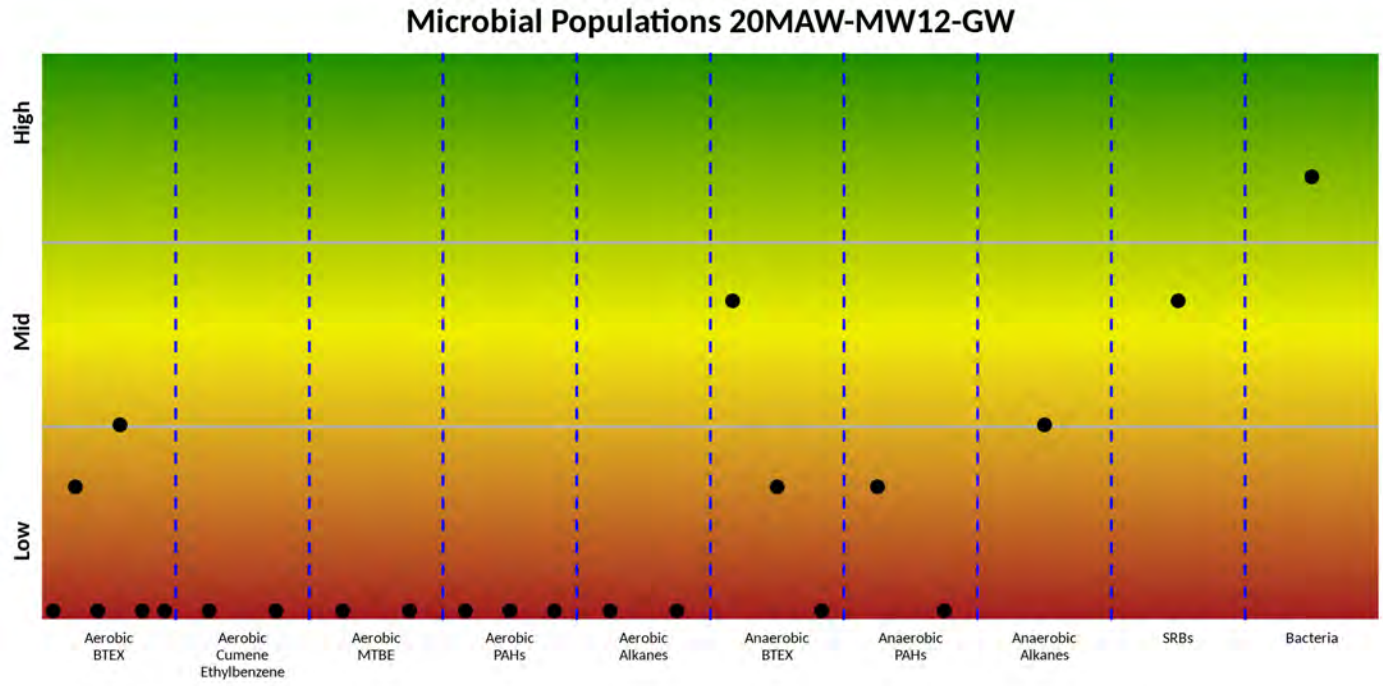

Figure 3: Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

Aerobic		Anaerobic	
BTEX	TOD, PHE, RDEG, RMO, TOL, EDO	BTEX	BCR, BSS, ABC
Cumene, Ethylbenzene	EDO, BPH4	Naphthalene/Methylnaphthalene	MNSSA, ANC
MTBE/TBA	PM1, TBA	Alkanes	assA
Naphthalene	NAH, NidA		
Phenanthrene	PHN		
Alkanes	ALK, ALMA		

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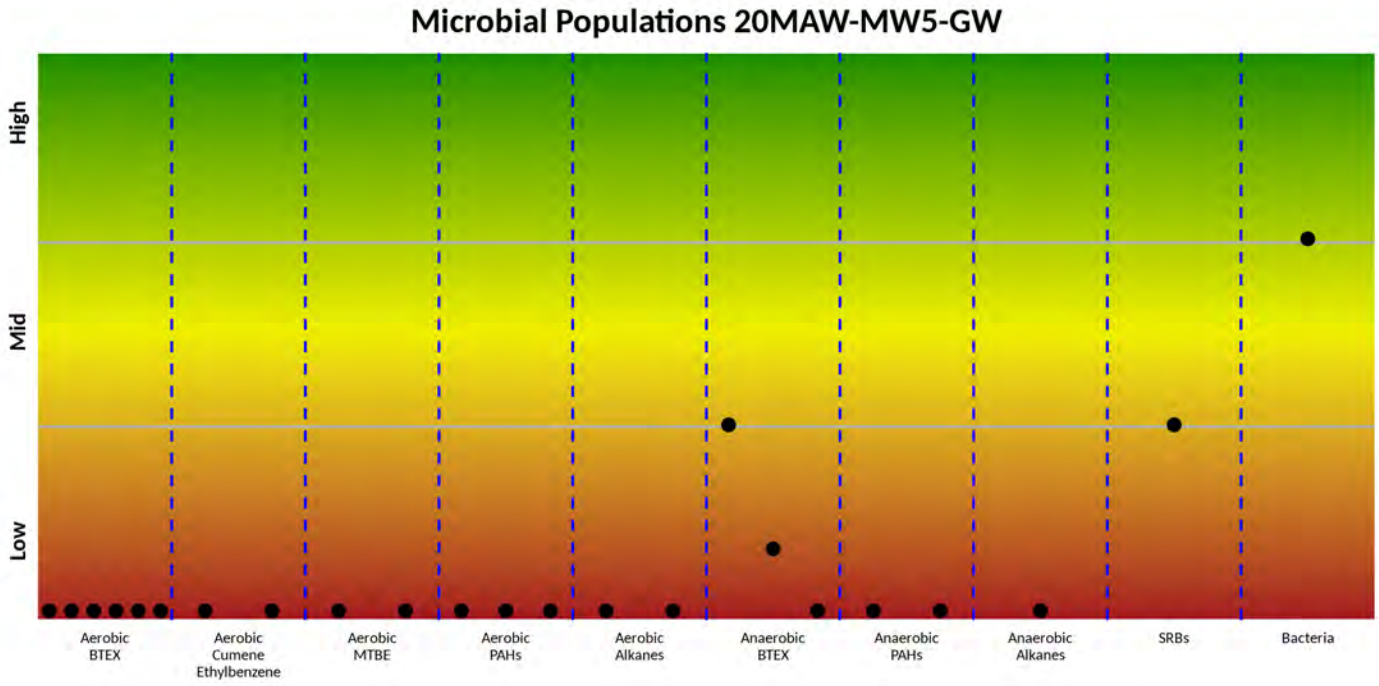

Figure 4: Microbial population summary to aid in evaluating potential pathways and biodegradation of specific contaminants.

Aerobic		Anaerobic	
BTEX	TOD, PHE, RDEG, RMO, TOL, EDO	BTEX	BCR, BSS, ABC
Cumene, Ethylbenzene	EDO, BPH4	Naphthalene/Methylnaphthalene	MNSSA, ANC
MTBE/TBA	PM1, TBA	Alkanes	assA
Naphthalene	NAH, NidA		
Phenanthrene	PHN		
Alkanes	ALK, ALMA		

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Table 2: Summary of the QuantArray®-Petro results for microorganisms responsible for aerobic biodegradation of BTEX and MTBE for samples 20MAW-MW8-GW, 20MAW-MW10-GW, 20MAW-MW12-GW, and 20MAW-MW5-GW.

Sample Name Sample Date	20MAW-MW8-GW 12/15/2020	20MAW-MW10-GW 12/15/2020	20MAW-MW12-GW 12/16/2020	20MAW-MW5-GW 12/16/2020
Aerobic BTEX and MTBE	cells/mL	cells/mL	cells/mL	cells/mL
Toluene/Benzene Dioxygenase (TOD)	<5.00E+00	**2.43E+01**	<5.00E+00	<4.50E+00
Phenol Hydroxylase (PHE)	**5.07E+03**	**4.71E+04**	**2.28E+02**	<4.50E+00
Toluene 2 Monooxygenase/Phenol Hydroxylase (RDEG)	**2.70E+03**	**9.34E+04**	<5.00E+00	<4.50E+00
Toluene Ring Hydroxylating Monooxygenases (RMO)	**7.17E+03**	**5.09E+04**	**1.17E+02**	<4.50E+00
Xylene/Toluene Monooxygenase (TOL)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Ethylbenzene/Isopropylbenzene Dioxygenase (EDO)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Biphenyl/Isopropylbenzene Dioxygenase (BPH4)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Methylibium petroleiphilum PM1 (PM1)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
TBA Monooxygenase (TBA)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00

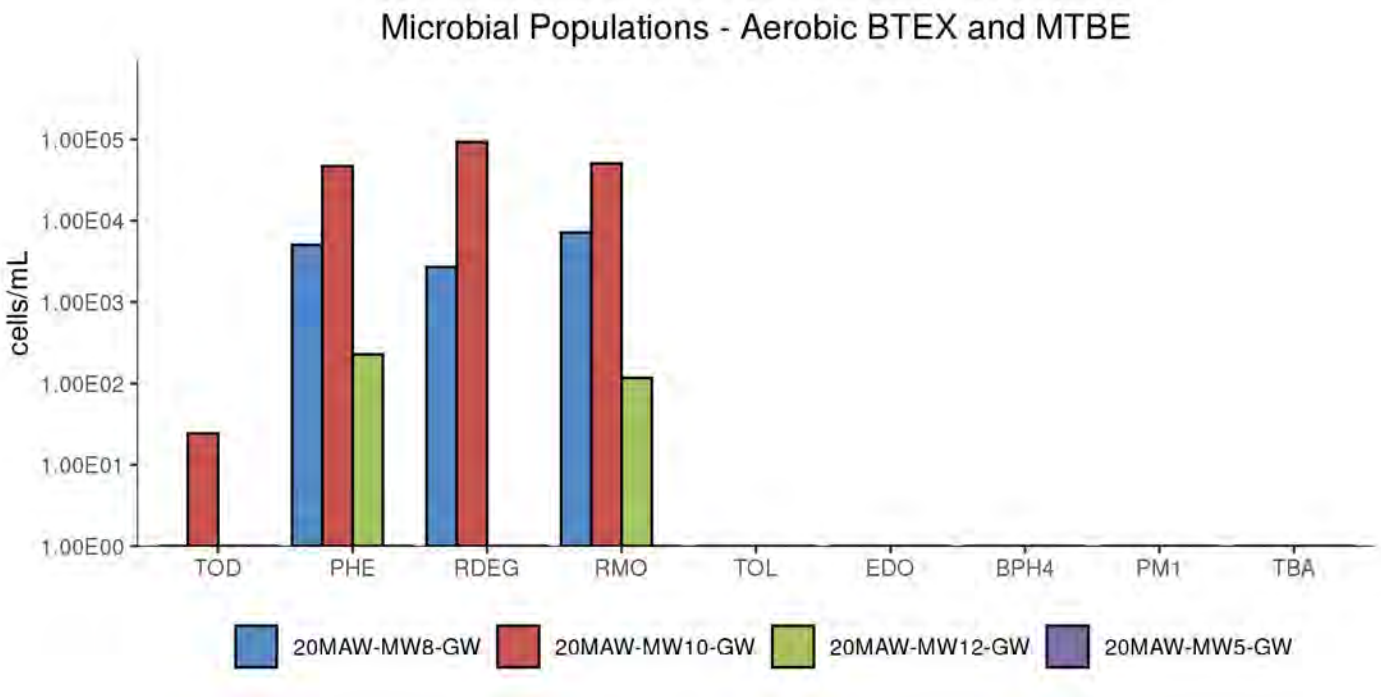

Figure 5: Comparison - microbial populations involved in aerobic biodegradation of BTEX and MTBE.

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Table 3: Summary of the QuantArray®-Petro results for microorganisms responsible for aerobic biodegradation of PAHs and alkanes for samples 20MAW-MW8-GW, 20MAW-MW10-GW, 20MAW-MW12-GW, and 20MAW-MW5-GW.

Sample Name Sample Date	20MAW-MW8-GW 12/15/2020	20MAW-MW10-GW 12/15/2020	20MAW-MW12-GW 12/16/2020	20MAW-MW5-GW 12/16/2020
Aerobic PAHs and Alkanes	cells/mL	cells/mL	cells/mL	cells/mL
Naphthalene Dioxygenase (NAH)	**5.80E+00**	<7.10E+00	<5.00E+00	<4.50E+00
Naphthalene-inducible Dioxygenase (NidA)	**3.99E+01**	<7.10E+00	<5.00E+00	<4.50E+00
Phenanthrene Dioxygenase (PHN)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Alkane Monooxygenase (ALK)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Alkane Monooxygenase (ALMA)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00

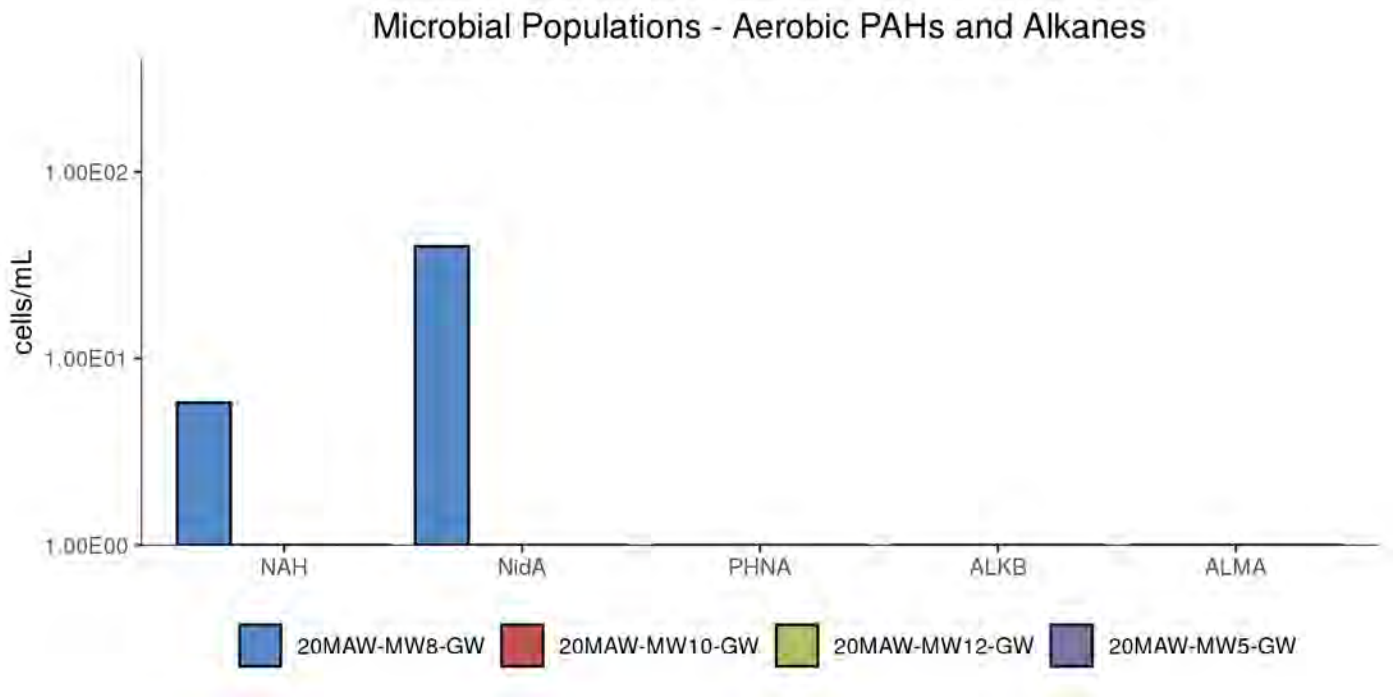

Figure 6: Comparison - microbial populations involved in aerobic biodegradation of PAHs and alkanes.

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Table 4: Summary of the QuantArray®-Petro results for microorganisms responsible for anaerobic biodegradation of BTEX, PAHs and alkanes for samples 20MAW-MW8-GW, 20MAW-MW10-GW, 20MAW-MW12-GW, and 20MAW-MW5-GW.

Sample Name Sample Date	20MAW-MW8-GW 12/15/2020	20MAW-MW10-GW 12/15/2020	20MAW-MW12-GW 12/16/2020	20MAW-MW5-GW 12/16/2020
Anaerobic BTEX	cells/mL	cells/mL	cells/mL	cells/mL
Benzoyl Coenzyme A Reductase (BCR)	**2.12E+03**	**9.37E+02**	**1.58E+03**	**2.13E+02**
Benzylsuccinate Synthase (BSS)	**6.40E+03**	**1.17E+04**	**3.80E+02**	**8.22E+01**
Benzene Carboxylase (ABC)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Anaerobic PAHs and Alkanes				
Naphthylmethylsuccinate Synthase (MNSSA)	**5.16E+03**	**1.33E+03**	**8.86E+02**	<4.50E+00
Naphthalene Carboxylase (ANC)	<5.00E+00	<7.10E+00	<5.00E+00	<4.50E+00
Alkylsuccinate Synthase (ASS)	**3.90E+01**	**1.65E+02**	**6.86E+02**	<4.50E+00

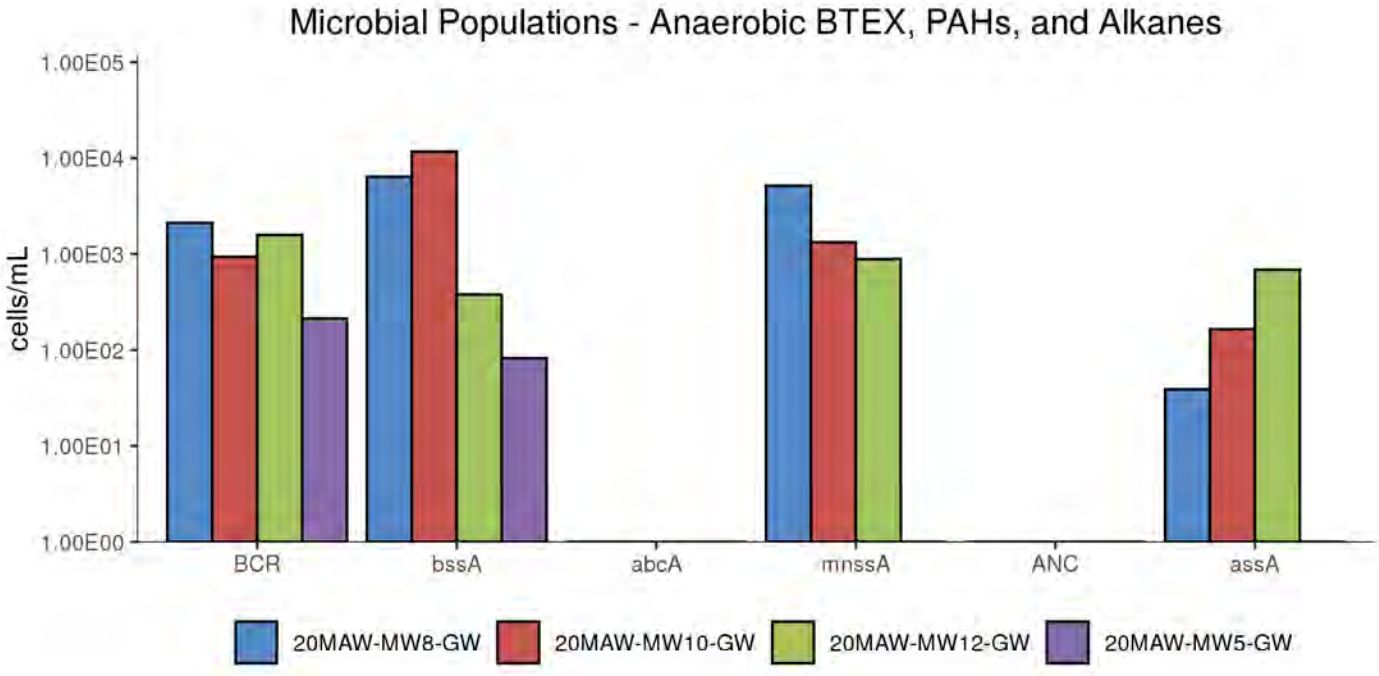

Figure 7: Comparison - microbial populations involved in anaerobic biodegradation of BTEX, PAHs and alkanes.

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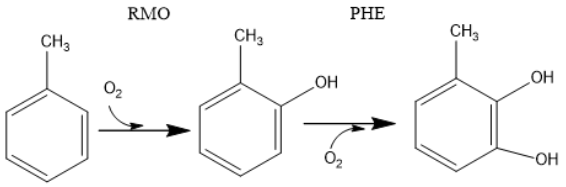
Interpretation

The overall purpose of the QuantArray®-Petro is to give site managers the ability to simultaneously yet economically evaluate the potential for biodegradation of a spectrum of contaminants found in petroleum products through a multitude of aerobic and anaerobic pathways to give a much more clear and comprehensive view of contaminant biodegradation. The following discussion describes interpretation of results in general terms and is meant to serve as a guide.

Aerobic Biodegradation - Benzene Toluene, Ethylbenzene, and Xylenes (BTEX): At sites impacted by petroleum products, aromatic hydrocarbons including BTEX are often contaminants of concern. Aerobic biodegradation of aromatic hydrocarbons has been intensively studied and multiple catabolic pathways have been well characterized. The substrate specificity of each pathway (range of compounds biodegraded via each pathway) is largely determined by the specificity of the initial oxygenase enzyme. The QuantArray®-Petro includes a suite of assays targeting the initial oxygenase genes of the known pathways for aerobic BTEX biodegradation.

Toluene/Benzene Dioxygenase (TOD): Toluene/benzene dioxygenase (TOD) incorporates both atoms of molecular oxygen into the aromatic ring. Although commonly called toluene dioxygenase, the substrate specificity of this enzyme is relaxed, allowing growth on toluene and benzene along with co-oxidation of a variety of compounds including ethylbenzene, *o*-xylene, *m*-xylene, and trichloroethene (TCE) when expressed.

Toluene/Benzene Monooxygenases (RMO/RDEG) and Phenol Hydroxylases (PHE): The next three known pathways for aerobic biodegradation of toluene (as well as benzene and xylenes) involve two steps: (1) an initial oxidation mediated by a toluene monooxygenase and (2) a second oxidation step catalyzed by a phenol hydroxylase. In these pathways, the toluene monooxygenases have been referred to as "ring hydroxylating monooxygenases" because they initiate biodegradation of toluene by incorporating oxygen directly into the aromatic ring rather than at a methyl group. The ring hydroxylating monooxygenases (RMOs) can be further described as toluene-2-monooxygenases, toluene-3-monooxygenases, or toluene-4-monooxygenases based upon where they attack the aromatic ring.



In General, phenol hydroxylases (PHE) catalyze the continued oxidation of phenols produced by RMOs. However, the difference between toluene monooxygenases (RMOs) and phenol hydroxylases (PHEs) is not absolute in terms of substrate specificity and catabolic function. For example, the TbmD toluene/benzene-2-monooxygenase [1] may be responsible for both the initial and second oxidation step [2].

The RMO, RDEG, and PHE assays target groups of genes encoding enzymes which perform the critical first and/or second steps in the aerobic biodegradation of BTEX compounds. In general terms, the RMO assay quantifies families of toluene-3-monooxygenase and toluene-4-monooxygenase genes. The RDEG assay is used to quantify groups of toluene-2-monooxygenase and phenol hydroxylase genes. Similarly, the PHE assay targets phenol hydroxylase genes and several benzene monooxygenase genes which catalyze both oxidation steps.

Toluene/Xylene Monooxygenase (TOL): The final known pathway for aerobic toluene biodegradation involves initial monooxygenase attack at the methyl group by a toluene/xylene monooxygenase.

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Ethylbenzene Dioxygenase (EDO): Similar to TOD, this group of aromatic oxygenases exhibits relatively broad specificity and is responsible for aerobic biodegradation of alkylbenzenes including ethylbenzene and isopropylbenzene or cumene [3].

Biphenyl Dioxygenase (BPH4): In environmental restoration, biphenyl dioxygenases are best known for cometabolism of polychlorinated biphenyls (PCBs). However, this subfamily includes benzene [4] and isopropylbenzene [5] dioxygenases from *Rhodococcus* spp.

Aerobic Biodegradation - MTBE and TBA: With increased use in the 1990s, the fuel oxygenate methyl *tert*-butyl ether (MTBE) has become one of the most commonly detected groundwater contaminants at gasoline contaminated sites. Pure cultures capable of utilizing MTBE as a growth supporting substrate have been isolated [6] and aerobic biodegradation of MTBE and the intermediate *tert*-butyl alcohol (TBA) has been reasonably well characterized. The QuantArray®-Petro includes quantification of two gene targets to assess the potential for aerobic biodegradation of MTBE and TBA.

Methylibium petroleiphilum PM1 (PM1): One of the few organisms isolated to date which is capable of utilizing MTBE and TBA as growth supporting substrates [6].

TBA Monooxygenase (TBA): Targets the TBA monooxygenase gene responsible for oxidation of TBA by *Methylibium petroleiphilum* PM1 [7].

Aerobic Biodegradation - Naphthalene and Other PAHs:

Naphthalene Dioxygenase (NAH): Naphthalene dioxygenase incorporates both atoms of molecular oxygen into naphthalene to initiate aerobic metabolism of the compound. However, the broad substrate specificity of naphthalene dioxygenase has been widely noted. When expressed, naphthalene dioxygenase is capable of catalyzing the oxidation of larger PAHs like anthracene, phenanthrene, acenaphthylene, fluorene, and acenaphthene. For a more comprehensive list of reactions mediated by naphthalene dioxygenases, see the University of Minnesota Biocatalysis/Biodegradation Database. (http://eawag-bbd.ethz.ch/naph/ndo.html, [8]).

Phenanthrene Dioxygenases (PHN): The PHN assays quantify phenanthrene/naphthalene dioxygenase genes from a diverse collection of microorganisms including *Pseudomonas*, *Burkholderia*, *Sphingomonas*, and *Acidovorax* spp. As with other naphthalene dioxygenases, substrate specificity is relatively broad and phenanthrene dioxygenases have been implicated in the biodegradation of naphthalene, phenanthrene, and anthracene and the co-oxidation of larger PAHs. Moreover, at least one research group has suggested that the PHN group of phenanthrene/naphthalene dioxygenases may be more environmentally relevant than the classical *nah*-like naphthalene dioxygenase [9].

Aerobic Biodegradation - *n*-alkanes: The *n*-alkanes are a substantial portion of petroleum products and are a component of TPH concentrations. The QuantArray®-Petro also includes quantification of alkane monooxygenase genes (ALK) which allow a wide range of *Proteobacteria* and *Actinomycetals* to grow on *n*-alkanes with carbon lengths from C_5 to C_{16} [10]. The QuantArray®-Petro also includes a second type of alkane hydroxylase (almA) which catalyzes the aerobic biodegradation of longer chain alkanes (C_{20}-C_{32}) by some *Alcanivorax* spp. considered dominant in marine systems [11].

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Anaerobic Biodegradation - Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX): BTEX compounds are also susceptible to biodegradation under anoxic and anaerobic conditions although biodegradation pathways for each compound are not as well characterized as aerobic pathways. The QuantArray®-Petro includes sets of assays targeting a number of upper and lower pathway functional genes involved in the anaerobic catabolism of BTEX compounds for better evaluation of anaerobic biodegradation at petroleum contaminated sites.

Benzylsuccinate Synthase (BSS): Of the BTEX compounds, toluene biodegradation under anaerobic conditions is the most extensively studied and best characterized. The first step in this pathway, mediated by benzylsuccinate synthase (*bss*A) is the addition of fumarate onto the toluene methyl group to form benzylsuccinate. While additional pathways are possible, some bacterial isolates capable of anaerobic biodegradation of ethylbenzene and xylenes follow the same metabolic approach where the first step is the addition of fumarate.

Anaerobic Benzene Carboxylase (ABC): Although additional pathways are possible, the only pathway for anaerobic biodegradation of benzene elucidated to date is initiated by a benzene carboxylase enzyme.

Benzoyl Coenzyme A Reductase (BCR): Benzoyl-CoA is the central intermediate in the anaerobic biodegradation of many aromatic hydrocarbons. Benzoyl-CoA Reductase (BCR) is the essential enzyme for reducing the benzene ring structure.

Anaerobic Biodegradation - PAHs: The anaerobic biodegradation of PAHs involves analogous mechanisms to those described for anaerobic biodegradation of BTEX compounds. For example, the anaerobic biodegradation of methyl-substituted PAHs like 2-methylnaphthalene is initiated by fumarate addition to the methyl group while the only characterized pathway for anaerobic naphthalene biodegradation is initiated by a carboxylase.

Naphthylmethylsuccinate Synthase (MNSSA): MNSSA is analogous to the benzylsuccinate synthase described above for anaerobic biodegradation of toluene. Naphthylmethylsuccinate synthase catalyzes the addition of fumarate onto the methyl group of 2-methylnaphthalene [12].

Anaerobic Naphthalene Carboxylase (ANC): To date, the only pathway that has been characterized for anaerobic biodegradation of naphthalene is initiated by a naphthalene carboxylase enzyme [13].

Anaerobic Biodegradation - *n*-alkanes: As mentioned previously, the *n*-alkanes are a substantial portion of petroleum products and should be considered particularly when site cleanup goals include TPH reduction. The addition of fumarate is a common mechanism for activating and initiating biodegradation of a variety of petroleum hydrocarbons under anaerobic conditions including *n*-alkanes. The QuantArray®-Petro includes quantification of alkyl succinate synthase genes (assA) which have been characterized in nitrate reducing and sulfate reducing isolates utilizing *n*-alkanes from C_6 to at least C_{18} [14].

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2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-2.1 Summary of Microorganisms Present In Wells

Lab Name	Sample Name	Sample Date	Date Received	Sample Matrix	LIMS Identifier	Extraction Date	Analysis Date	Analysis Method	Parameter	Result	Result Qualifier	Units	Detection Limit	Report Limit
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	abcA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	ALKB	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	ALMA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	ANC	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	APS	5.29E+04	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	assA	3.90E+01	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	BCR	2.12E+03	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	BPH4	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	bssA	6.40E+03	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	EBAC	2.87E+06	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	EDO	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	mnssA	5.16E+03	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	NAH	5.80E+00	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	NidA	3.99E+01	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	PHE	5.07E+03	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	PHNA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	PM1	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	RDEG	2.70E+03	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	RMO	7.17E+03	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	TBA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	TOD	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW8-GW	12/15/2020	12/16/2020	Water	096RL-1	12/16/2020	12/30/2020	Quantarray	TOL	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	abcA	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	ALKB	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	ALMA	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	ANC	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	APS	4.09E+04	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	assA	1.65E+02	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	BCR	9.37E+02	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	BPH4	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	bssA	1.17E+04	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	EBAC	3.63E+07	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	EDO	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	mnssA	1.33E+03	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	NAH	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	NidA	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	PHE	4.71E+04	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	PHNA	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	PM1	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	RDEG	9.34E+04	=	cells/mL	1.00E-01	7.10E+00

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
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Lab Name	Sample Name	Sample Date	Date Received	Sample Matrix	LIMS Identifier	Extraction Date	Analysis Date	Analysis Method	Parameter	Result	Result Qualifier	Units	Detection Limit	Report Limit
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	RMO	5.09E+04	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	TBA	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	TOD	2.43E+01	=	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW10-GW	12/15/2020	12/17/2020	Water	096RL-2	12/17/2020	12/30/2020	Quantarray	TOL	7.10E+00	<	cells/mL	1.00E-01	7.10E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	abcA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	ALKB	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	ALMA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	ANC	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	APS	4.54E+04	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	assA	6.86E+02	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	BCR	1.58E+03	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	BPH4	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	bssA	3.80E+02	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	EBAC	1.01E+06	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	EDO	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	mnssA	8.86E+02	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	NAH	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	NidA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	PHE	2.28E+02	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	PHNA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	PM1	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	RDEG	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	RMO	1.17E+02	=	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	TBA	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	TOD	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW12-GW	12/16/2020	12/17/2020	Water	096RL-3	12/17/2020	12/30/2020	Quantarray	TOL	5.00E+00	<	cells/mL	1.00E-01	5.00E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	abcA	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	ALKB	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	ALMA	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	ANC	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	APS	3.49E+03	=	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	assA	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	BCR	2.13E+02	=	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	BPH4	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	bssA	8.22E+01	=	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	EBAC	4.39E+05	=	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	EDO	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	mnssA	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	NAH	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	NidA	4.50E+00	<	cells/mL	9.10E-02	4.50E+00

2020 MarkAir Warehouse Groundwater Monitoring – Fairbanks International Airport, Fairbanks, Alaska
Table F-2.1 Summary of Microorganisms Present In Wells

Lab Name	Sample Name	Sample Date	Date Received	Sample Matrix	LIMS Identifier	Extraction Date	Analysis Date	Analysis Method	Parameter	Result	Result Qualifier	Units	Detection Limit	Report Limit
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	PHE	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	PHNA	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	PM1	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	RDEG	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	RMO	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	TBA	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	TOD	4.50E+00	<	cells/mL	9.10E-02	4.50E+00
MI	20MAW-MW5-GW	12/16/2020	12/18/2020	Water	096RL-4	12/18/2020	12/30/2020	Quantarray	TOL	4.50E+00	<	cells/mL	9.10E-02	4.50E+00

QA Data						
Component	Date Received	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
QA PETRO POS	12/16/2020	12/30/2020	1	110	0	0
Component	Date Received	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
QA PETRO POS	12/17/2020	12/30/2020	0	110	0	0
Component	Date Received	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
QA PETRO POS	12/18/2020	12/30/2020	0	110	0	0

REPORT TO:

Name: Guy Wade
Company: Jacobs Engineering / CH2M HILL
Address: 949 E. 36th Ave, Suite 500
Anchorage, AK 99508 USA
email: guy.wade@jacobs.com
Phone: 907-382-7774
Fax:

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)

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Company: Jacobs Engineering / CH2M Hill
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Phone: 907-382-7774
Fax:

microbialinsights
10515 Research Dr
Knoxville, TN 37932
865-573-8188
www.microbe.com

Project Manager: Guy Wade
Project Name: Mark Air / Airport DOT
Project No.: D3414000

Purchase Order No. D3414000
Subcontract No.
MI Quote No. Q202619.0009

Please Check One:
☑ More samples to follow
☐ No Additional Samples

Report Type: ☑ Standard (default) ☐ Microbial Insights Level III raw data (15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive (15%) ☐ Historical Interpretive (35%)

EDD type: ☑ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information						Analyses				CENSUS: Please select the target organism/gene																						
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	NGS	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (Dve, tce, vcr)	DHBt (Dehalobacter)	DHG (Dehalogenimonas)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Denitrifiers-nirS and nirK)	AMO (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add qPCR	RNA (Expression Option)*	Other:	Other:	Other:
096RL 1	20MAW-MW8-GW	12/15/20	1036	GW	1				1																							
	20MAW-MW ~~12/15/20~~ Void 12/15/20																															

Relinquished by: Kai Hagen Date 12/15/20 1200
Received by: MJ Hume Date 12/16/20 1450

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

REPORT TO:

Name: Guy Wade
Company: Jacobs Engineering / CH2M HILL
Address: 949 E. 36th Ave, Suite 500
Anchorage, AK 99508 USA
email: guy.wade@jacobs.com
Phone: 907-382-7774
Fax:

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Please Check One:
☑ More samples to follow
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Report Type: ☑ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (35%)

EDD type: ☑ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information						Analyses				CENSUS: Please select the target organism/gene																					
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	NGS	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DHG (Dehalogenimonas)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Denitrifiers-nirS and nirK)	AMO (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
096RL2	20MAW-MW10-GW	12/15/20	15:36	GW	2				1																						
3	20MAW-MW12-GW	12/16/20	0945	GW	1				1																						
	~~20MAW-MW5-GW~~	12/16/20							1																						
	lost 12/16/20																														

Relinquished by: [signature] Date 12/16/2020 1200
Received by: [signature] Date 12/17/2020 1130

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REPORT TO:

Name: Guy Wade
Company: Jacobs / CH2m Hill
Address: 949 E. 36th Ave Ste. 500
Anchorage, AK 99508

email: guy.wade@jacobs.com
Phone: 907-382-7774
Fax:

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)

Name: Guy Wade
Company: Jacobs
Address: same

email: guy.wade@jacobs.com
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865-573-8188
www.microbe.com

Project Manager: Guy Wade
Project Name: Mark Air / FAI
Project No.: D3414000

Purchase Order No. D3414000
Subcontract No.
MI Quote No. Q202619.0009

Please Check One:
☐ More samples to follow
☑ No Additional Samples

Report Type: ☑ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (35%)

EDD type: ☑ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type: _____

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information						Analyses				CENSUS: Please select the target organism/gene																						
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	NGS	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DHG (Dehalogenimonas)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirK)	AMO (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
0916RL4	20MAW-MW5-GW	12/16/20	16:21	GW	1				1																							

Relinquished by: Kari Hayes Date 12/17/20 1200
Received by: Date 12/18/2020 1200

It is vital that chain of custody is filled out correctly & that all relative information is provided.
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Appendix G
Mann-Kendall Time-Series Plots

APPENDIX G
Mann-Kendall Time Series Plots

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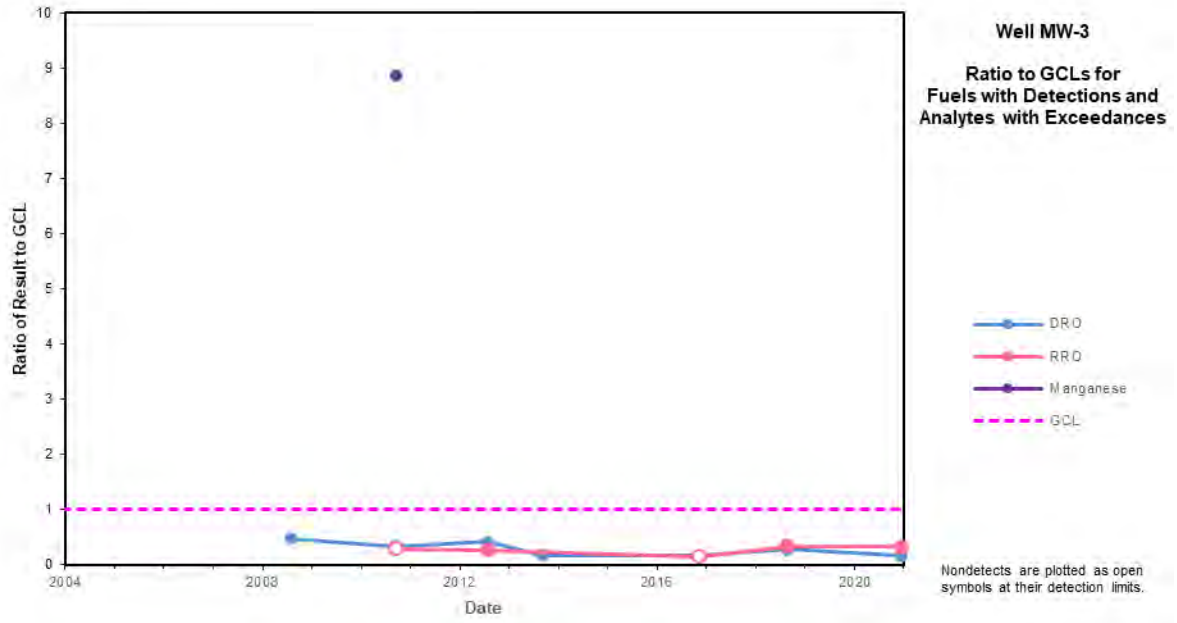
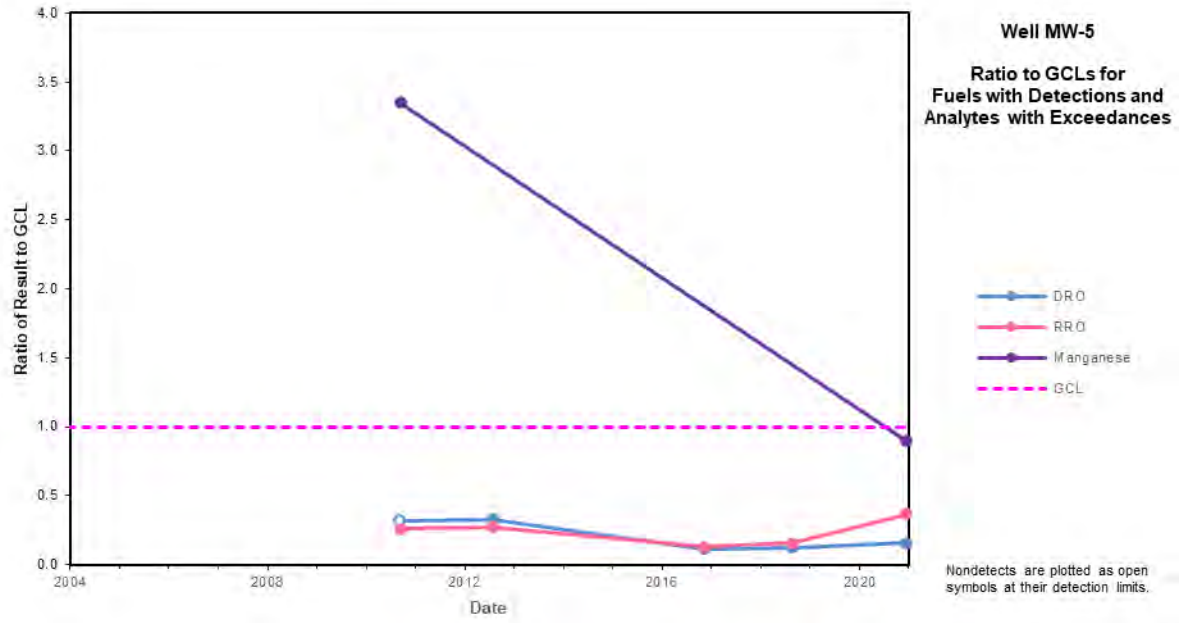
Plot MW-3
Monitoring Well MW-3 Time Series Ratio to GCLs for Contaminants



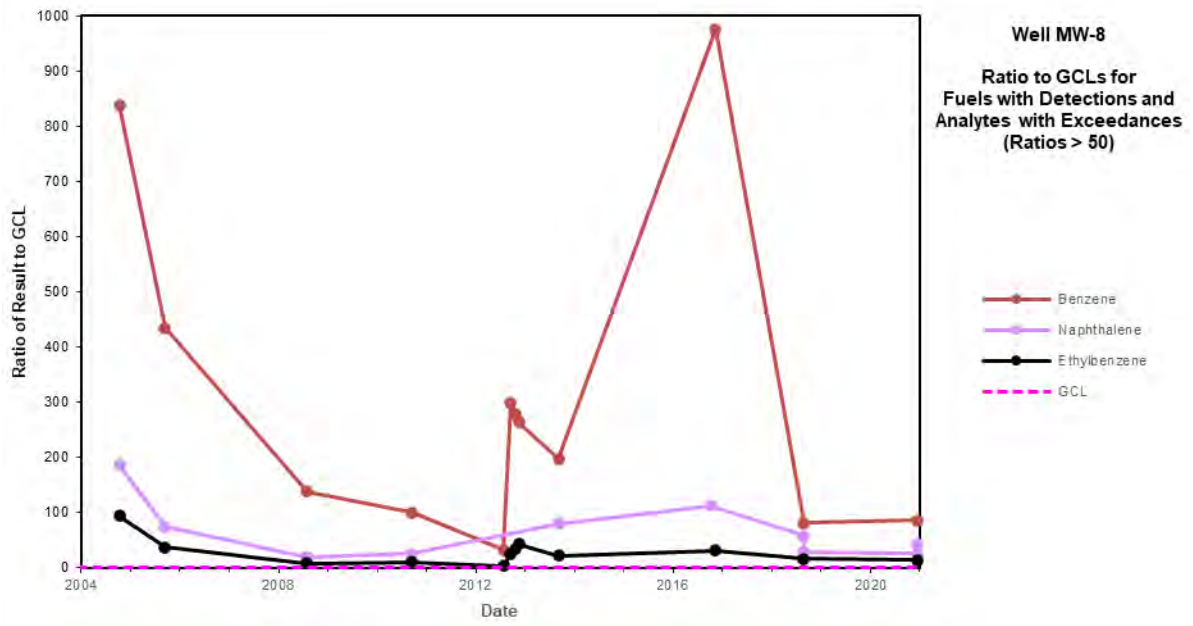
Notes:
GCLs are based on 18 AAC 75. Table C Groundwater Cleanup Levels (ADEC 2020b)
For definitions, refer to the Acronyms and Abbreviations section.

Plot MW-5
Monitoring Well MW-5 Time Series Ratio to GCLs for Contaminants

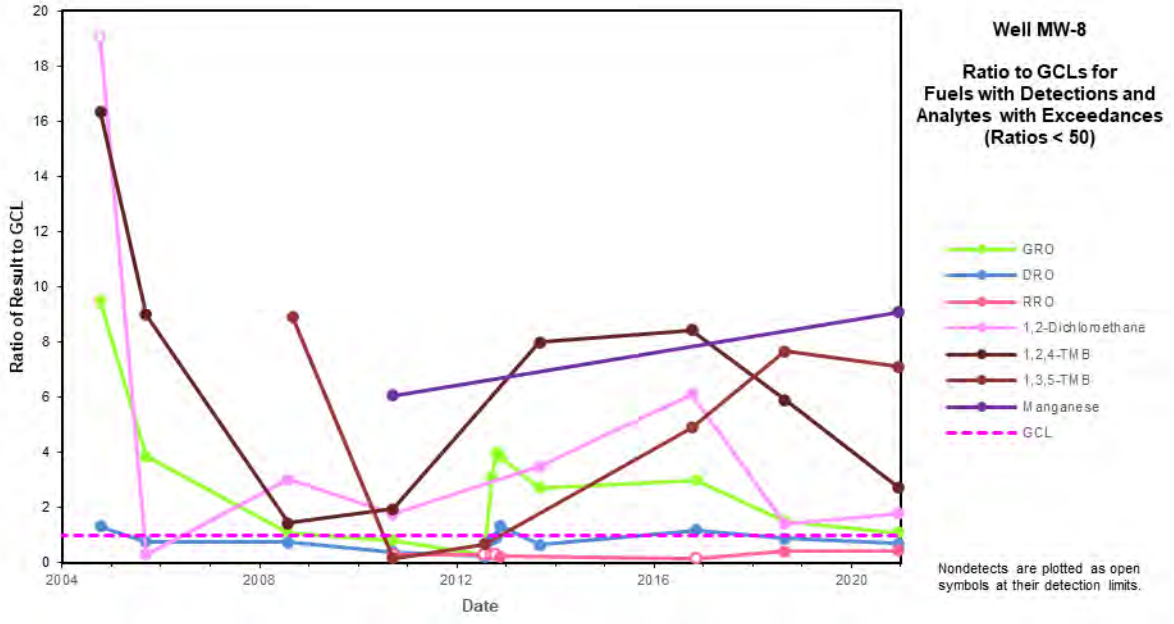


Notes:
GCLs are based on 18 AAC 75. Table C Groundwater Cleanup Levels (ADEC 2020b)
For definitions, refer to the Acronyms and Abbreviations section.

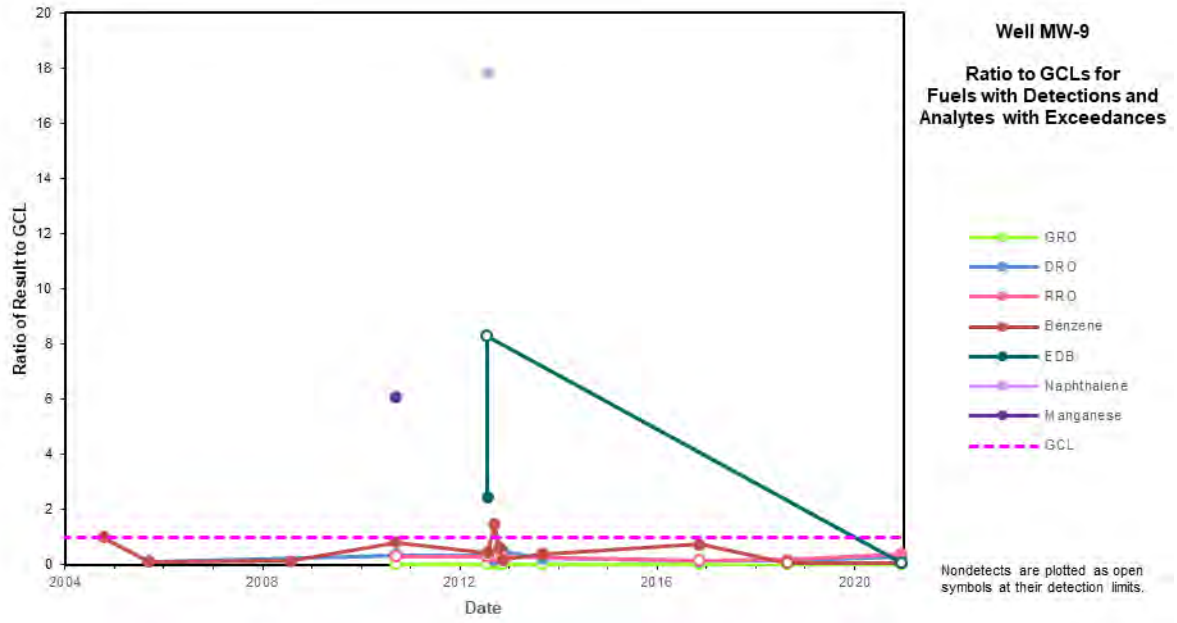
Plot MW-8.1
Monitoring Well MW-8 Time Series Ratio to GCLs for Contaminants for Ratios > 50



Plot MW-8.2
Monitoring Well MW-8 Time Series Ratio to GCLs for Contaminants for Ratios < 50

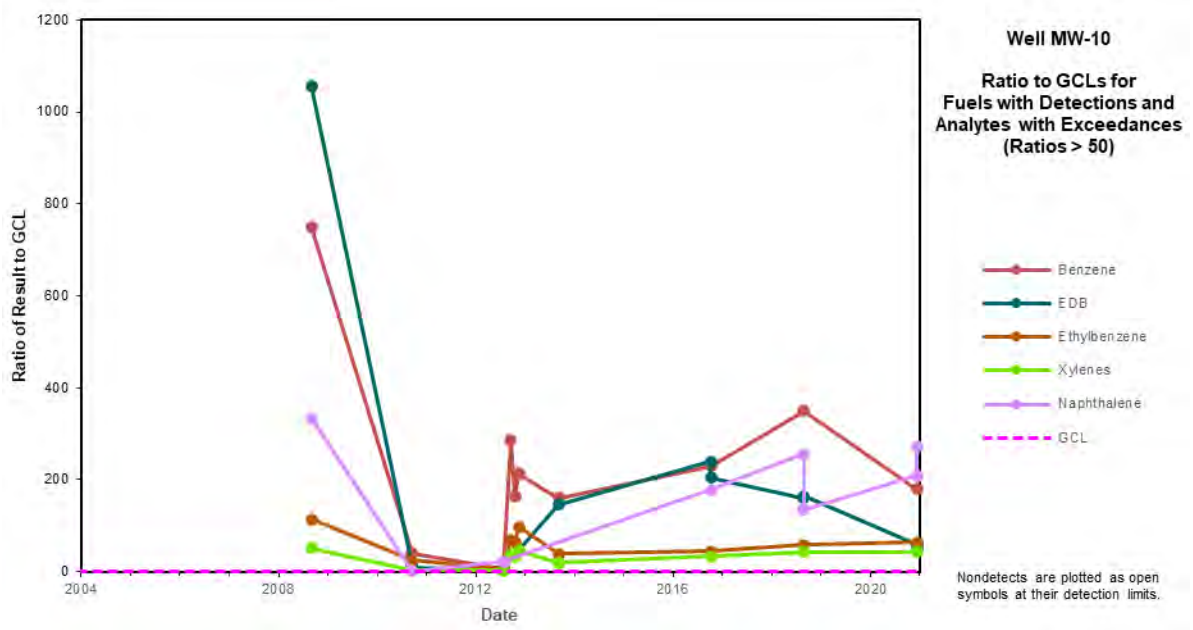


Plot MW-9
Monitoring Well MW-9 Time Series Ratio to GCLs for Contaminants

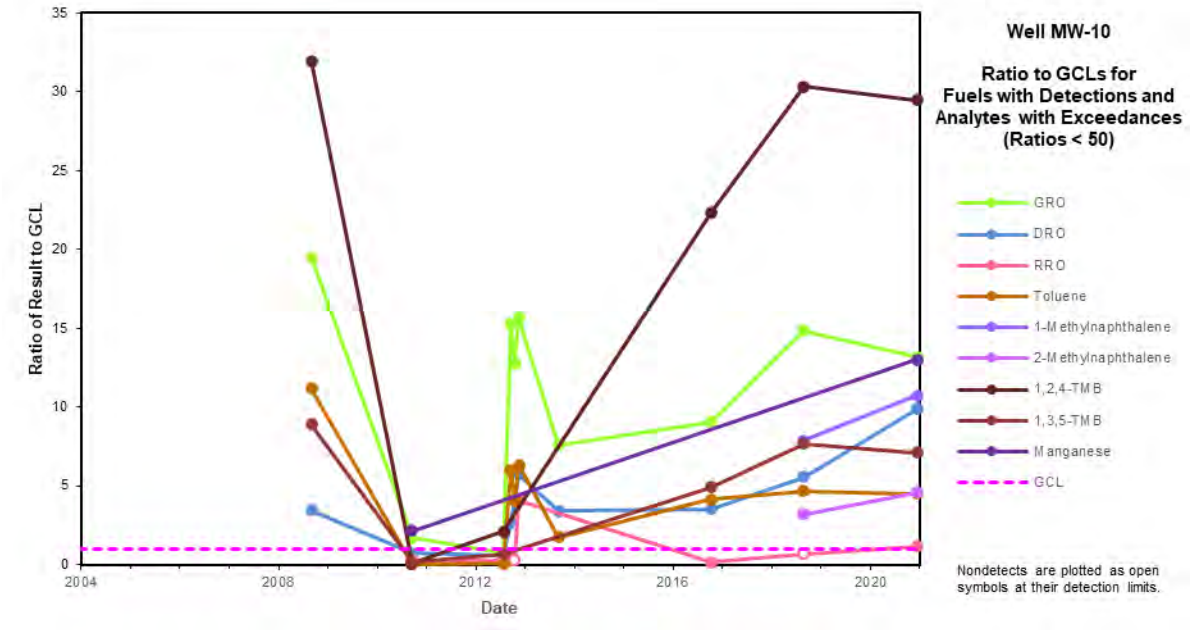


Notes:
GCLs are based on 18 AAC 75. Table C Groundwater Cleanup Levels (ADEC 2020b)
For definitions, refer to the Acronyms and Abbreviations section.

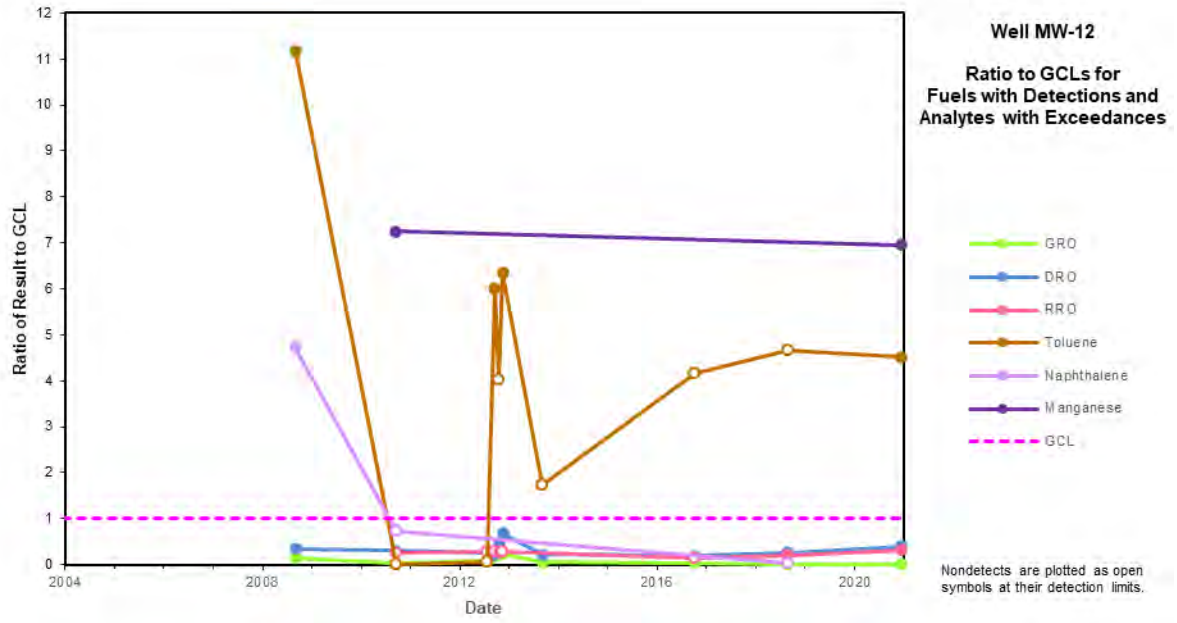
Plot MW-10.1
Monitoring Well MW-10 Time Series Ratio to GCLs for Contaminants for Ratios > 50



Plot MW-10.2
Monitoring Well MW-10 Time Series Ratio to GCLs for Contaminants for Ratios < 50

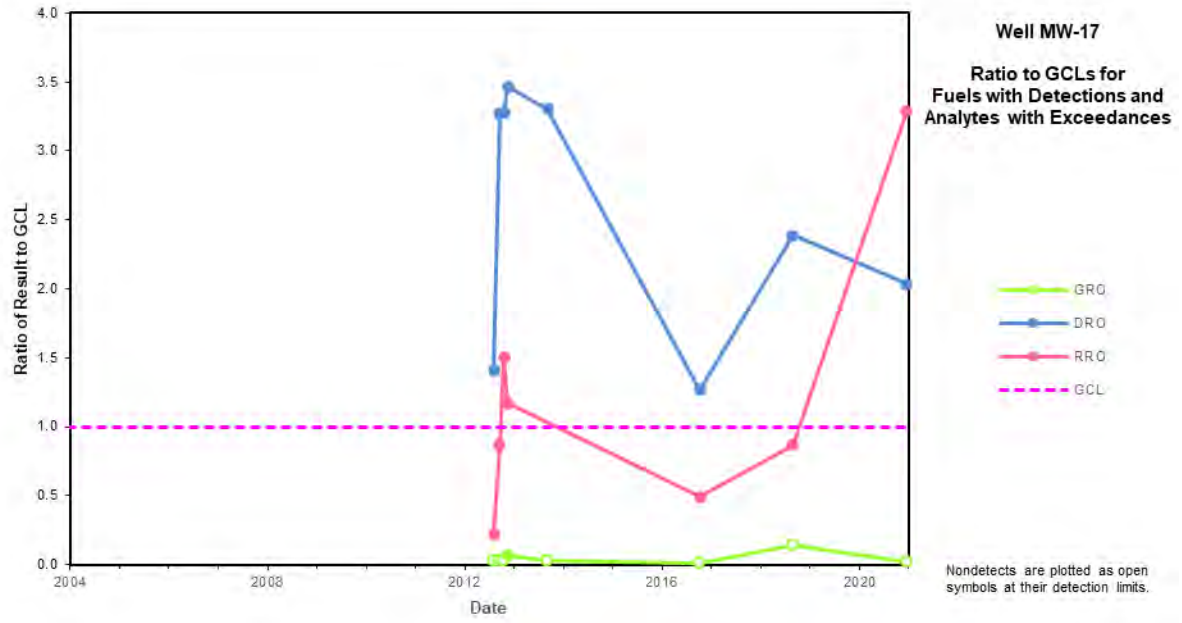


Plot MW-12
Monitoring Well MW-12 Time Series Ratio to GCLs for Contaminants



Notes:
GCLs are based on 18 AAC 75. Table C Groundwater Cleanup Levels (ADEC 2020b)
For definitions, refer to the Acronyms and Abbreviations section.

Plot MW-17
Monitoring Well MW-17 Time Series Ratio to GCLs for Contaminants



Notes:
GCLs are based on 18 AAC 75. Table C Groundwater Cleanup Levels (ADEC 2020b)
For definitions, refer to the Acronyms and Abbreviations section.

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Appendix H
Standard Operating Procedure

JACOBS®

Standard Operating Procedure

Decontamination

Document No: JE-SOP-2000	Page: 1 of 2
Effective Date: 6 December 2019	Rev. 0.2

TABLE OF CONTENTS

1.0 SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to describe the procedures for decontamination of re-usable equipment used during sampling activities. Non-disposable equipment shall be decontaminated between sampling locations and at the end of the work shift.

This SOP defines a standard set of procedures that may be varied or changed as required by site conditions, equipment limitations, or other factors. Actual decontamination procedures and variances from this SOP will be documented in the field logbooks.

2.0 INTERFERENCES

Improper decontamination may cause cross-contamination of field screening and analytical samples. To prevent cross-contamination of samples, sampling equipment will be disposable and used only once, or reusable but decontaminated before each use. Manufacturer and/or laboratory-certified clean glassware will be used to contain analytical samples.

3.0 EQUIPMENT

Decontamination equipment may include, but is not limited to, the following:

- Appropriate personal protective equipment (PPE) (at minimum, safety glasses and nitrile gloves)
- 5-gallon buckets
- Potable water
- Distilled water or organic free deionized (DI) water
- Alconox or similar detergent
- Stiff bristle brushes
- Other hand tools for gross decontamination (e.g. shovels and brooms)
- Logbook

4.0 PROCEDURES

Procedures for decontamination include gross decontamination and decontamination of sampling equipment.

4.1. Gross Decontamination

Heavy equipment used onsite will undergo decontamination prior to leaving the site to eliminate contaminant migration from the site as well as the potential for cross-contamination of sites. Gross decontamination includes the removal of potentially contaminated materials with a shovel or other hand tools and stiff bristle brushes for equipment contaminated by soil, and wiping visible contamination from equipment contaminated by water or free product. Materials removed during gross decontamination will be accumulated and managed with similar waste streams according to *Waste Management* standard operating procedure (JE-SOP-2100).

4.2. Decontamination of Sampling Equipment

Contaminant-free disposable sampling equipment will be used whenever possible. Non-disposable equipment that may directly or indirectly contact samples (e.g., shovels, buckets, drill stem and tooling, sampling devices, and instruments) shall be decontaminated prior to sampling. Decontamination will take place over catch basins (e.g., wash tubs and buckets) to minimize the spread of contaminants. Re-usable sampling equipment that may be exposed to the samples will be decontaminated with the following steps:

- Scrub and rinse the equipment using a solution of potable water and laboratory-grade detergent (Alconox or similar product).
- Rinse the equipment with distilled or deionized water until free from suds.

Decontamination water will be accumulated and managed according to the *Waste Management* standard operating procedure (JE-SOP-2100).

4.3. Quality Control

The following QC sample may be collected to verify equipment utilized was properly decontaminated before subsequent use.

- Equipment rinsate blank
- Equipment wipe sample

5.0 HEALTH AND SAFETY

Procedures for working with potentially hazardous materials as well as the relevant Safety Data Sheets (SDS) for each chemical that will be used at the site are included in the Site Safety and Health Plan. Personnel using this procedure must be trained on the information contained in the SDSs, engineering controls, and the PPE used for this procedure.

6.0 REFERENCES

ADEC. 2019 (October). *Field Sampling Guidance*. Division of Spill Prevention and Response Contaminated Sites Program.

Appendix I
Conceptual Site Model

Print Form

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name: FIA - MarkAir Warehouse

File Number: ADEC File: 100.26.043 Hazard ID: 22871

Completed by: Jennifer Davis Robinson, Jacobs Engineering

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources *(check potential sources at the site)*

- ☒ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☐ Other:

Release Mechanisms *(check potential release mechanisms at the site)*

- ☒ Spills
- ☒ Leaks
- ☐ Direct discharge
- ☐ Burning
- ☐ Other:

Impacted Media *(check potentially-impacted media at the site)*

- ☐ Surface soil (0-2 feet bgs*)
- ☒ Subsurface soil (>2 feet bgs)
- ☐ Air
- ☐ Sediment
- ☒ Groundwater
- ☐ Surface water
- ☐ Biota
- ☐ Other:

Receptors *(check receptors that could be affected by contamination at the site)*

- ☐ Residents (adult or child)
- ☒ Commercial or industrial worker
- ☒ Construction worker
- ☐ Subsistence harvester (i.e. gathers wild foods)
- ☐ Subsistence consumer (i.e. eats wild foods)
- ☒ Site visitor
- ☒ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☒ Other: Site employee

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete: Complete

Comments:

Contamination is present at concentrations exceeding ADEC cleanup levels in soil between 0 and 15 feet bgs.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Naphthalene and 1-methylnaphthalene were detected at concentrations greater than 1/10 the ADEC HH cleanup levels in soil at approximately 11 feet bgs.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☒

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the ground-water is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

Based on the results of the 2020 results, GRO, DRO, RRO, BTEX, 1,2,4-TMB, 1,3,5-TMB, naphthalene, EDB , and EDC are present at the site at concentrations exceeding 1/10 18 AAC 75 Table C Groundwater Human Health Cleanup Levels. Groundwater is currently not used for drinking water and areawide contamination widely known by ADEC should prohibit future use of groundwater as a drinking source.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future? ☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities). ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

The nearest surface water body is the Chena River, located approximately 0.3-mile from the site. It is not anticipated that the Chena River has been impacted by site contamination.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods? ☐

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)? ☐

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.) ☐

If all of the boxes are checked, label this pathway complete: Incomplete

Comments:

The site is paved and no trees or shrubs are present. Because the lot is paved, it is unlikely that burrowing animals are present in the subsurface. In addition, the site is not used for hunting or harvesting.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Per the 2010 groundwater monitoring report CSM update, benzene and total xylenes were detected in soil above the ADEC inhalation cleanup levels and toluene and ethylbenzene were detected above the ADEC migration to groundwater cleanup levels. The detections occurred at ~10 feet bgs.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminted soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures) ☒

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Soil contaminated with volatiles in exceedance of cleanup levels remains in situ adjacent to the warehouse in a few places.

3. **Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Groundwater depth is approximately 10-feet bgs. Exposure to naphthalene during construction activities during is possible but not likely. No construction is currently planned for the site.

There is no surface water body and no wells are used for household purposes.

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Exposure to groundwater is considered for a future scenario only since no drinking water wells currently exist and this is in a commercial area and not a residential zone.

Development of new water wells for drinking or household purposes is unlikely given the known groundwater contamination status of the region.

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM_{10}). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Site is currently paved. Fugitive dust is possible during construction, but no construction is planned for the site.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

There is no sediment at this site because no surface water is present and asphalt covers the site.

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: FIA - MarkAir Warehouse (ADEC File: 100.26.043 Hazard ID: 22871)

Completed By: Jennifer Davis Robinson - Jacobs Engin

Date Completed: 12/1/2021

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1)

Check the media that could be directly affected by the release.

(2)

For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.

(3)

Check all exposure media identified in (2).

(4)

*Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5)

Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.

Current & Future Receptors

Media	Transport Mechanisms	Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☐ Surface Soil (0-2 ft bgs)	☐ Direct release to surface soil — check soil ☐ Migration to subsurface — check soil ☐ Migration to groundwater — check groundwater ☐ Volatilization — check air ☐ Runoff or erosion — check surface water ☐ Uptake by plants or animals — check biota ☐ Other (list):	☑ soil	☑ Incidental Soil Ingestion		F	F	F			F
			☑ Dermal Absorption of Contaminants from Soil		F	F	F			F
			☑ Inhalation of Fugitive Dust		F	F	F			F
☑ Subsurface Soil (2-15 ft bgs)	☐ Direct release to subsurface soil — check soil ☑ Migration to groundwater — check groundwater ☑ Volatilization — check air ☐ Uptake by plants or animals — check biota ☐ Other (list):	☑ groundwater	☐ Ingestion of Groundwater							
			☑ Dermal Absorption of Contaminants in Groundwater		F	F	F			F
			☐ Inhalation of Volatile Compounds in Tap Water							
☑ Ground-water	☐ Direct release to groundwater — check groundwater ☑ Volatilization — check air ☐ Flow to surface water body — check surface water ☐ Flow to sediment — check sediment ☐ Uptake by plants or animals — check biota ☐ Other (list):	☑ air	☑ Inhalation of Outdoor Air		F	F	F			F
			☑ Inhalation of Indoor Air		C/F	C/F	C/F			C/F
			☑ Inhalation of Fugitive Dust		F	F	F			F
☐ Surface Water	☐ Direct release to surface water — check surface water ☐ Volatilization — check air ☐ Sedimentation — check sediment ☐ Uptake by plants or animals — check biota ☐ Other (list):	☐ surface water	☐ Ingestion of Surface Water							
			☐ Dermal Absorption of Contaminants in Surface Water							
			☐ Inhalation of Volatile Compounds in Tap Water							
☐ Sediment	☐ Direct release to sediment — check sediment ☐ Resuspension, runoff, or erosion — check surface water ☐ Uptake by plants or animals — check biota ☐ Other (list):	☐ sediment	☐ Direct Contact with Sediment							
		☐ biota	☐ Ingestion of Wild or Farmed Foods							

Revised, 10/01/2010

Appendix J
Response to Comments

ADEC Comments to *2021 MarkAir Warehouse GW Monitoring Report*

Reviewer: Rebekah Reams, Environmental Program Specialist, Alaska Department of Environmental Conservation

Comment No.	Pg. #	Section	Comment/Recommendations	Response
1.	ES-2, 6-1	Executive Summary, Conclusions	Please note that Residual Range Organics (RRO) and 1,3,5-trimethylbenzene exceeded cleanup levels in MW-10 and 1,2-dichloroethane (EDC) exceeded cleanup levels in MW-8.	Agreed. The executive summary will be revised to indicate that RRO exceeded cleanup levels in MW-10 and 1,2-EDC exceeded cleanup level in MW-8. The 1,3,5-TMB exceedance is included in the 5th bullet on page ES-2 of the Executive Summary. In addition, section 5.2.2 (pp. 5-3 and 5-4) will be revised to indicate RRO concentrations exceeded the cleanup level in MW-10. Table E-2 will be revised to include results of RRO in MW-10 in bold font.
2.	ES-2	Executive Summary	Typo: This section states that according to Mann-Kendall trend analysis, concentrations of DRO are increasing in MW-9. The information presented in the remainder of the report indicates DRO concentrations are stable in MW-9 and increasing in MW-10.	Agreed. Text on page ES-2 will be revised to read as follows: "Results of a Mann-Kendall trend analysis of contaminant concentrations indicated DRO concentrations are decreasing in monitoring well MW-3, increasing in monitoring well MW-***10***, and stable in the rest of the sampled wells at the MAW site."
3	2-2	Groundwater Monitoring	Please provide additional details regarding monitoring well sampling procedures, including the pump intake depth during sample collection and the order in which analytical samples were collected.	Accepted. The following text will be added to the last paragraph in Section 2.2. "*The bladder pump intake depth was set to within 1 foot of the top of static groundwater within each monitoring well during sample collection, except at MW-12, where the intake was set to 1.13 feet below the static water level. Groundwater samples were collected into containers provided by the laboratory in the following analyte order: volatiles (GRO, BTEX, VOCs, EDB, and/or EDC) and then DRO/RRO. Groundwater samples were collected for analysis of MNA parameters and microbial communities (described in Sections 2.2.1 and 2.2.2) once sample collection for analysis of contaminants of concern was completed.*"

ADEC Comments to *2021 MarkAir Warehouse GW Monitoring Report*

Reviewer: Rebekah Reams, Environmental Program Specialist, Alaska Department of Environmental Conservation

Comment No.	Pg. #	Section	Comment/Recommendations	Response
4.	2-4	Investigation-Derived Waste	Please collect analytical samples from the investigation-derived waste (IDW) prior to transport and disposal. Samples should include analysis for PFAS in addition to site contaminants of concern (COCs) due to the presence of PFAS contaminated groundwater in the area. These analytical waste characterization results should be submitted to DEC with a Contaminated Media Transport and Treatment or Disposal Approval Form that indicates the proposed final destination of the IDW.	Clarification. The IDW characterization sampling was conducted under a separate contract with a different consultant (Shannon & Wilson, Inc.). Per communication with the consultant on 12/2/2021, the drummed waste from the MarkAir and Brooks Fuel sites, both placed in the same drum (DRUM-21-02), was sampled for PFAS. Per the consultant, the results did not exceed for PFAS and the contractor will coordinate with a subcontractor (US Ecology) to determine the appropriate waste transport and disposal method.
5.	5-3	Analytical Results: DRO	Mann-Kendall analysis indicates concentrations of DRO in MW-10 are increasing and analytical results from this sampling event report the highest concentrations of DRO observed in groundwater at the site. Please provide additional discussion regarding this increase in concentration. Site photos included in the report document the presence of a trailer parked over MW-10, please note if there was any indicators suggesting that MW-10 may be acting as a preferential pathway for contaminant migration.	Accepted. A discussion of the increasing trend in DRO concentrations at MW-10 will be added to Sections 5.3 Mann-Kendall Analysis and 7.1 Conclusions (formerly Section 6.1). Part of the added discussion will include a discussion of observations at MW-10 and additional recommendations in Section 7.2.
6.	5-8	General Chemistry Parameters for MNA	Please provide additional interpretation of monitored natural attenuation (MNA) parameters and discuss how these parameters support the conclusion that natural attenuation is occurring at the site.	Accepted. Section 5.2.3 will be expanded to include a brief discussion of each MNA parameter and the implications of the results. Conclusions drawn from the MNA parameter results will also be included in Section 7.1 (previously Section 6.1).
7.	n/a	Attachment F-1	Please provide complete analytical laboratory data packages as report attachments.	Accepted. The analytical laboratory data packages will be included with the report.

ADEC Comments to *2021 MarkAir Warehouse GW Monitoring Report*

Reviewer: Rebekah Reams, Environmental Program Specialist, Alaska Department of Environmental Conservation

Comment No.	Pg. #	Section	Comment/Recommendations	Response
8.	n/a	General	Does the information presented in the report update our understanding of the current conceptual site model?	The last CSM was drafted in 2012 using data obtained from the 2010 groundwater monitoring event and the site characterization report. New CSM graphic and scoping forms will be drafted and included in Appendix I. A summary of the updated CSM will be included in a new section (Section 6.0) in the report.
9.	n/a	General	Is there any additional information available regarding the status of MW-13 or the structure that is reportedly covering the well?	There is no new information regarding MW-13. This well was not visited as part of the groundwater monitoring event in 2020. Based on 2017 imagery in Figure A-2, the well appears to be located beneath a building or storage shed, however.