

2022 Landfarm Sampling and Groundwater Monitoring Report

**Kotzebue Former IHS/BIA Hospital – School Pipeline Release
(ADEC File. No. 410.38.025 and Hazard ID. 25558)
Kotzebue, Alaska**



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TABLE OF CONTENTS

1.0	SITE DESCRIPTION AND BACKGROUND	1
1.1	Project Purpose and Objectives.....	1
1.2	Site Location	1
1.3	Background	2
2.0	CONTAMINANTS OF CONCERN	4
3.0	FIELD ACTIVITIES	5
3.1	Work Plan Variances.....	5
3.2	Product Monitoring Activities.....	5
3.3	Landfarm Soil Treatment and Maintenance.....	6
3.3.1	Landfarm Soil Sampling	6
3.4	Groundwater Monitoring Activities	7
3.4.1	Water Level Measurements and Flow Direction	7
3.4.2	Groundwater Sampling	7
4.0	SAMPLING RESULTS	8
4.1	Landfarm Soil Results.....	8
4.2	Product Monitoring Results	9
4.3	Groundwater Monitoring Results.....	10
5.0	DISCUSSION	13
5.1	Landfarm Sampling Discussion	13
5.2	Groundwater Monitoring Discussion.....	13
5.3	Conceptual Site Model Discussion	16
6.0	QUALITY CONTROL REVIEW	17
6.1	SGS Report 1224988 Landfarm Soil Samples.....	17
6.2	SGS Report 1224980 Groundwater Samples	17
7.0	INVESTIGATIVE DERIVED WASTE MANAGEMENT	18
8.0	CONCLUSIONS AND RECOMMENDATIONS	18
9.0	REFERENCES	20

TABLES

Table 1 – Summary of Landfarm Soil Headspace Results	9
Table 2 – Summary of 2019 Landfarm Soil Analytical Results	9
Table 3 –Groundwater Levels and Elevations	10
Table 4 –Summary of Detectable Groundwater Analytical Results	11
Table 5 –Historical Groundwater Sampling Results	14

FIGURES

Figure 1 – Vicinity Map	
Figure 2 – Landfarm 2022 Sample Locations	
Figure 3 – Groundwater Monitoring Well Locations and Groundwater Elevation Contours	
Figure 4 – Historical DRO Groundwater Concentrations	

APPENDICES

Appendix A – Field Notes	
Appendix B – Photo Pages	
Appendix C – Disposal Documentation	
Appendix D – SGS Laboratory Reports and Laboratory Data Review Checklists	
Appendix E – Resumes of QEPs	
Appendix F – <i>Human Health Conceptual Site Model Graphic Form and Human Health Conceptual Site Model Scoping Form and Standardized Graphic</i>	
Appendix G – DEC Review Comment Table	

ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC / DEC	Alaska Department of Environmental Conservation
ADOT&PF	Alaska Department of Transportation and Public Facilities
AST	Aboveground Storage Tank
bgs	Below Ground Surface
BIA	Bureau of Indian Affairs
BTOC	Below Top of Casing
COPC	Constituents of Potential Concern
CSM	Conceptual Site Model
DRO	Diesel Range Organics
EIT	Engineer in Training
ft	Feet
GAC	Granulated Activated Carbon
GRO	Gasoline Range Organics
HH	Human Health
IDW	Investigation Derived Waste
IHS	Indian Health Service
KIC	Kikiktagruk Inupiat Corporation
KICC	Kikiktagruk Inupiat Corporation Construction
LOQ	Limits of Quantitation
MAC	Maximum Allowable Concentration
ug/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
MTG	Migration to Groundwater
ND	Not Detected
PAH	Polyaromatic Hydrocarbon
PCE	Tetrachloroethene
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppmv	Parts Per Million by Volume
QC	Quality Control
QEP	Qualified Environmental Professional
RPD	Relative Percent Difference
RRO	Residual Range Organics
SGS	SGS North America, Inc.
TC-EM JV	Tanana Commercial-Environmental Management Joint Venture
TOC	Top of Casing
USS	United States Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

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This report outlines the 2022 landfarm sampling and groundwater monitoring activities at the former Indian Health Service/Bureau of Indian Affairs (IHS/BIA) Hospital – School Pipeline (subject property) Release in Kotzebue, Alaska. The site is identified as Alaska Department of Environmental Conservation (ADEC) Contaminated Sites File No. 410.38.025 and Hazard ID 25558.

Work was conducted by Tanana Commercial-Environmental Management JV, LLC (TC-EM JV) in accordance with the Professional Services Contract, Amendment 7, from Maniilaq Association.

1.0 SITE DESCRIPTION AND BACKGROUND

The subject property is an active ADEC Contaminated Site and encompasses several lots in Kotzebue, Alaska. The following outlines the purpose of the monitoring and regulatory background, site location, and previous field activities.

1.1 Project Purpose and Objectives

The purpose of the project is to progress toward Cleanup Complete with Institutional Controls for the site. The project objectives include the following:

- Monitoring of product from Monitoring Wells MW1 and MW6 (if present) on Lots 5 and Tract 4A, respectively;
- Groundwater monitoring of the site’s ten existing wells (Lots 3 through 5 and Tract 4A);
- Characterize the soil generated during the 2019 and 2020 excavation and treated at the Kikiktagruk Inupiat Corporation (KIC) Base Road landfarm cells.

1.2 Site Location

The ADEC Contaminated Site covers land in the area of the former IHS Hospital and BIA school. The source area consists of Tracts 1 and 4 of United States Survey (USS) 2083. The site is located in the northeast ¼ of the northwest ¼ of Section 3, Township 17 North, Range 18 West, Kateel River Meridian, Alaska (Kotzebue D-2 USGS Quadrangle). The Vicinity Map showing the general location of the project area is included as Figure 1.

The former IHS hospital was located between Second Avenue and Third Avenue, southwest of the current elementary school. The tank farm serving the hospital was located to the north along Second Avenue, near the intersection of Ocean Avenue.

The complete extent of contamination has not yet been determined and likely extends beyond the original ten acres of land and following parcels. The lots included in this assessment and their former uses are the following (WHPacific, 2015):

- Lot 3 – Former BIA school and small structures once part of the hospital; current residential
- Lot 4 – former hospital grounds (1928-1962); current pedestrian/public use, FRF Building (also known as the Ferguson Building)
- Lot 5 – former hospital grounds (1961-1996); current pedestrian/public use, fenced light industrial
- Tract 4A – former BIA fuel pipeline corridor to the 1961 hospital; current Kotzebue school complex

Field activities in 2022 primarily focused on groundwater monitoring of the wells near the former IHS hospital (MW-1, MW-2, MW-7, MW-8, and MW-10) carried out concurrently with groundwater monitoring of the wells located near the former BIA school (MW-3 through MW-6, MW-9).

In addition, characterization of contaminated soil generated from 2019 and 2020 field activities took place at the landfarm property that is owned by KIC and is located off of Base Road in Kotzebue. Kikiktagruk Inupiat Corporation Construction (KICC) maintains and manages the 2019 and 2020 contaminated soils at the landfarm. The location of the Base Road landfarm is shown on Figure 1. The soil that was generated from the 2020 excavation on Lot 4 was characterized to determine the presence of contaminants, and the soil from the 2019 excavation was sampled to determine if diesel range organic (DRO) contaminants are present.

1.3 Background

Oil was first discovered in the Kotzebue Elementary School basement and are believed to be a combination of fuel storage tank releases, damaged fuel distribution line, fuel storage tank overfills and other sources (ADEC, 2015). In 1980 the ADEC became aware of the product release when fuel oil was being discharged from an oil-water separator located in the elementary school's basement. The ADEC estimated during the initial investigation that between 100,000 and 200,000 gallons of diesel fuel had been released. Between 1979 and 1980 an estimated 100,000 gallons of fuel was pumped from the basement, and an estimated 40,000 gallons of fuel was recovered by ADEC contractors and citizens from recovery wells during 1980 and 1984. (WHPacific, 2015)

In 1986 the ADEC's contractor evaluated the extent of contamination and decommissioning of the pipeline. ADEC's contractor installed 25 monitoring wells and nine recovery wells. Within a month, all of the wells had evidence of fuel present. The pipeline was also exposed to a depth of less than 3 feet below ground surface and approximately 200 to 300 gallons of diesel was drained from the pipeline. The pipeline was then abandoned in place. (WH Pacific, 2015)

In 1988 an oil sheen was observed on the beach of Kotzebue Sound off of Shore Avenue. Shannon & Wilson installed and operated an oil-recovery system in 1989 which included a 435-foot-long

fabric barrier to prevent migration, additional recovery/monitoring wells, and a 74-foot long oil recovery trench in Second Avenue, north of the former hospital. As much as 2 feet of floating fuel was observed in several wells, but an estimated 5,000 to 7,000 gallons of fuel remained in the ground. The collection efforts ceased after 1990. (S&W, 2010)

In 2008, local residents notified the ADEC that a seasonal sheen was observed in Kotzebue Sound off of Shore Avenue. The ADEC contracted with Shannon & Wilson to collect pore water samples along the beach and install vapor probes near the elementary school. Pore-water samples indicate contamination is entering Kotzebue Sound. With the exception of a probe installed near the former hospital, soil vapor samples were below screening levels. Shannon & Wilson was also tasked with monitoring and recovery well and oil-recovery gallery decommissioning. Of the 64 wells installed in the late 1980s, only 15 were located and of those only three were in good working conditions. The 12 wells were decommissioned. The oil-recovery gallery was unable to be located but the sample collected from the vicinity exceeded DRO levels. (S&W, 2010)

In 2010 the Alaska Department of Transportation and Public Facilities (ADOT&PF) installed a sheet pile wall along the Shore Avenue. The sheet piles were installed along the tideline to approximately 25 feet below mean sea level and extend approximately 6 feet above the ground surface. The impact of this wall and migration towards Kotzebue Sound is unknown. (S&W, 2010)

In 2014 and 2015 WH Pacific conducted site investigations at the site. This included installation of four test pits, 45 soil borings, and 10 monitoring wells in 2014 in the vicinity of the abandoned in-place pipeline and areas of known or former contamination; groundwater sampling in 2014 and 2015; and a shallow soil gas survey in 2015. The highest concentrations were generally along the former BIA pipeline corridor on Tract 4A, and in the right-of-way area northwest of Building 314 and the FRF Building. The shallow soil gas survey did not indicate detectable levels of contaminants of concern in the school's playground area. (WH Pacific, 2015)

In 2019, TC-EM JV conducted pre-excavation sampling, underground storage tank (UST) removal, and groundwater sampling. The UST removal activities focused on the UST and concrete dispensing island along the north side of the FRF Building. While the presumed storage use of the tank was for vehicle fueling that was discontinued sometime prior to 1969, waste oil was encountered in the UST at the time of the field activities. Approximately 16 cubic yards (cy) of contaminated soil was removed during the UST removal activities and transported to KIC's lined landfarm cell on Base Road in Kotzebue. Concentrations greater than the ADEC cleanup levels remain in the UST excavation and based on field screening and analytical results and fact the tank and piping appeared in good condition, the contamination appeared more consistent with the historical fuel oil that has contaminated the project area and not from a release from the UST. Groundwater sampling activities were also conducted during the August 2019 field activities. Measurable product was encountered in Well MW1, which is consistent with the 2014 field activities. Contamination was present in the groundwater in each of the site's wells, with the highest concentrations encountered in the wells along the former pipeline corridor. (TC-EM JV, 2019)

In 2020, TC-EM JV conducted site characterization, soil removal activities, product and groundwater monitoring, and landfarm maintenance at the site. This included drilling 16 borings, monitoring 10 wells, and excavating approximately 170 cy of contaminated soil. Contamination is present in the groundwater in each of the site's wells with product encountered in Wells MW1 and MW6. Additionally, this monitoring event encountered Tetrachloroethene (PCE) in one or more wells though no known or suspected sources of PCE were observed during these field activities. Site characterization of Lot 3 revealed petroleum concentrations greater than ADEC Migration to Groundwater (MTG) cleanup levels but less than the ADEC Human Health/Maximum Allowable Concentration (HH/MAC) cleanup levels detected at various locations on the lot. Borings located on the south side of the duplexes (Buildings 307, 312, and 316) were less than ADEC MTG cleanup levels and, based on the groundwater flow direction measured fall of 2020, these borings are located upgradient in reference to other borings advanced in 2020, suggesting the southern extent of contamination is defined. Site characterization of Lot 4, conducted July 2020, revealed contamination greater than the ADEC HH/MAC cleanup levels. Fall of 2020 soil removal activities commenced, focusing on the excavation of contaminated soils on the northwest side of the Ferguson building. During cleanup activities, buried debris was encountered, and concentrations greater than ADEC HH/MAC cleanup levels remains on the edge of the property boundary of Lots 4 and 5. Site characterization of Lot 5 reveals free product, groundwater contamination, and contaminant concentrations greater than ADEC HH/MAC cleanup levels remains in the soil with the highest concentrations located on the northwest portion of the lot. (TC-EM JV, 2020)

In 2021, TC-EM JV conducted soil removal activities, product and groundwater monitoring and landfarm 2019 soil characterization. This included excavating approximately 218 cy of contaminated soil, monitoring 10 wells, and sampling the treated 2019 landfarmed soils. The 2019 treated soils at the landfarm contained DRO concentrations reduced to slightly above ADEC MTG cleanup level. The maximum DRO concentration result was 299 milligrams per kilogram (mg/kg) compared to the cleanup level of 250 mg/kg, and the location can be seen on Figure 3. Contamination was reported in each of the site wells, except for Well MW3, with product encountered in Wells MW1 and MW6. The soil removal activities concentrated on Lot 4 with results indicating the soil along the edge of the property boundary of Lots 4 and 5, and along the edge of the FRF building, remain above ADEC HH/MAC cleanup levels. During the cleanup activities, buried debris was encountered, including concrete asbestos pipe. Future removal actions in the vicinity will likely encounter additional buried materials. (TC-EM JV, 2021)

2.0 CONTAMINANTS OF CONCERN

The ADEC Contaminated Site's database identifies a historical spill of #1 diesel between 1950 and 1980 at the site that resulted in the estimated release of 100,000 to 200,000 gallons of fuel releases in an area of 10 or more acres. The source or sources are suspected to be a result of the following: 1) ruptured tank at the bulk fuel farm in the 1950s; 2) former distribution line between the bulk tank farm and the school and former hospital; and 3) aboveground storage tanks (ASTs and USTs and associated pipeline at the school and former hospital. In 1989, chromatographic

profiles from the samples of the contaminated material were consistent with No. 1 Fuel Oil. (S&W, 1990)

The constituents of potential concern (COPC) associated with the Former IHS/BIA Hospital-School Pipeline Release site as identified in previous investigations include the following petroleum-related compounds: gasoline range organics (GRO); diesel range organics (DRO); residual range organics (RRO); volatile organic compounds (VOCs); and polyaromatic hydrocarbons (PAH).

Soil and water samples collected during the field activities compared to the cleanup levels outlined in the following regulations:

- Soil: Method Two Under 40 Inch Zone Migration to Groundwater and Human Health and Inhalation levels outlined in Tables B1 and B2 in 18 Alaska Administrative Code (AAC) 75.341, *Oil and Other Hazardous Substances Pollution Control* (November 18, 2021).
- Groundwater: Table C in 18 AAC 75.345, *Oil and Other Hazardous Substances Pollution Control* (November 18, 2021)

3.0 FIELD ACTIVITIES

The field activities were conducted by TC-EM JV in August 2022 and included landfarm sampling and groundwater monitoring. Additional details on the field activities are described below. Field notes of the field activities are provided in Appendix A. Photographs of the field activities are provided in Appendix B.

3.1 Work Plan Variances

In general, the work followed the ADEC-approved work plan as written, with the following exceptions:

- Four headspace samples were collected from the 2020 landfarm soil cell on a 30-foot by 30-foot grid instead of the planned 10-foot by 10-foot grid, Ambient readings and odors indicated elevated levels of contamination were still present. Therefore, additional headspace samples were not collected for the 2020 landfarm soil cell.
- Headspace samples were collected on an approximate 13-foot by 10-foot grid on the 2019 soil cell due to approximately two feet of the west side of the cell having sacrificial fill mixed in with 2019 soils at a total depth of less than six inches.
- Two of the ten monitoring wells were not sampled due to the presence of product or lack of water.

3.2 Product Monitoring Activities

An oil-water interface probe was used during the groundwater monitoring event to assess whether free product may be present in the site wells. Product level measurements were collected for

Monitoring Well MW1. Monitoring Well MW6 was suspected to contain ice with potential product on top though no measurable level of product was present. Passive product recovery devices were installed in Wells MW1 and MW6.

3.3 Landfarm Soil Treatment and Maintenance

KICC performed landfarm treatment and maintenance of both cells (2019 and 2020-generated soils) throughout the summer of 2022. The 2019 landfarm cell is approximately 13 feet by 39 feet with soil no greater than 1 foot in thickness (approximately 16 cubic yards). The 2020 landfarm cell is an estimated 60 feet by 60 feet with soil approximately 1 foot in thickness (estimate of 170 cubic yards).

The soil in both landfarm cells was tilled on a bi-weekly basis or when weather allowed using a rototiller. Nutrients comprising a 50-pound bag of fertilizer (46-0-0) were added to the soil during the first tilling event on June 8, 2022 (Photo 2). KICC performed landfarm tilling on the following dates:

- June 8, 2022
- June 23, 2022
- July 6, 2022
- July 22, 2022
- August 24, 2022
- September 7, 2022

During landfarm tilling events and after large rain events, KICC also removed excess water from the inside of the landfarm. The water was pumped using a sump pump into a fabric filter and then into an on-site granulated activated carbon (GAC) system (Photo 4). Approximately 1,200 gallons of water were treated through the GAC filter in Summer 2022. Based on the volume of GAC, maximum concentrations encountered at the site, and amount of water treated to date, the GAC can continue to be used in 2023. The treated water was then discharged to the vegetated area southeast and outside of the landfarm on property also owned by KIC. The discharge location is approximately 950 feet from Kotzebue Sound and over 3 miles from the closest drinking water source (locations noted on Figure 1).

3.3.1 Landfarm Soil Sampling

On August 14 and 15, 2022 the 2019 and 2020 landfarm treated soil was sampled (Photo 3) according to the ADEC-approved work plan. The 2019 soil had been sampled in 2021, with one lab result exceeding ADEC Method Two Table B2 MTG cleanup levels for DRO. Note, the 2020 cell has not been previously sampled.

The 2019 cell was divided into a grid and four headspace samples were collected from the center of each grid. Due to ambient hydrocarbon odors, the 2020 cell was also divided into a four-quadrant grid with four headspace samples collected. All headspace samples were collected at approximately 0.5 feet below ground surface (bgs), at locations that were not saturated or represented base sacrificial soil.

The field headspace readings were collected by filling re-sealable quart size bags approximately 1/3 to 1/2 full with soil. The bags were then agitated before being allowed to develop for at least 10 minutes, but no longer than an hour. During this time the soils were warmed to a minimum temperature of 40°F. After the samples had been warmed and allowed to develop, the probe of the photoionization detector (PID) was inserted into the bag about one-half of the headspace depth and the highest displayed reading was recorded in the field notes along with other pertinent information such as time of collection and the location of the sample.

Two analytical soil samples plus one duplicate were selected for analysis, as seen in Figure 2, based on the approximate 16 cubic yards of soil known to be excavated in 2019. The samples were collected to be spatially representative of the landfarm soil, including the slightly elevated headspace sample where the duplicate was also collected. Analytical sample collection of the 2019 landfarm treated soil followed ADEC's January 2022 *Field Sampling Guide*, Table 2A, per the ADEC-approved work plan. Soil samples were collected using clean spoons and disposable equipment and placed directly into clean laboratory-provided containers.

The 2020 soils contained a hydrocarbon odor in each of the four headspace samples collected to determine if hydrocarbon contaminants were elevated across the cell. Therefore, no analytical samples were taken as the elevated headspace readings indicated residual contamination likely above ADEC Method Two Table B2 MTG cleanup levels based on previous headspace readings from the site.

3.4 Groundwater Monitoring Activities

Groundwater sampling was conducted on the site's ten monitoring wells on August 15 and 16, 2022. The locations of the monitoring wells are shown on Figure 3.

3.4.1 Water Level Measurements and Flow Direction

Water level measurements were collected for the site's wells on August 15, 2022. The measurements were collected during the ebb tide, noting the tidal variance on August 15, 2022 was 0.67 feet at high tide (10:39 am) and -0.09 feet at low tide (6:01 pm) according to the National Oceanic and Atmospheric Administration.

3.4.2 Groundwater Sampling

Groundwater sampling proceeded after water levels were collected from each of the wells per the ADEC-approved work plan. Analytical samples were collected in eight of the ten wells. The photo pages in Appendix B show the location and condition of each well during field activities. The following observations were noted:

- Due to the presence of product in Well MW1 (0.03 foot) and an obstruction in Well MW6, analytical samples were not collected.
- Water/product level measurements for Well MW6 were unattainable due to ice believed to be the obstruction at 4.3 feet below top of casing. An ambient PID value of 34.6 ppm was read at the top of the casing of Well MW6.
- Well MW2 was sampled after being uncovered from a gravel pile (Photo 7).

- Well MW6 had been located beneath soil and a water puddle (Photos 11 and 12) which were removed/diverted prior to recovery sock insertion.
- Well MW9 had bentonite swell over the height of the well cap (Photo 15) that was removed prior to sampling.
- Well MW10 was located nearly underneath the tire of a vehicle staged on Lot 5 (Photo 16).

The remaining wells were accessible and in good condition.

The monitoring wells without product were purged using low-flow sampling methods per the Environmental Protection Agency's 2010 *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells*. A decontaminated positive displacement submersible pump and disposable Teflon-lined tubing were used to purge and collect the groundwater monitoring well samples. When samples were being collected, the pump was initially placed to be within 1.5 feet of the water surface. Samples were collected by removing the inflow hose from the flow-through cell and filling laboratory-provided sample containers directly from the tube; first hydrochloric-acid preserved containers for GRO and VOC analysis, then unpreserved containers for PAH analysis, and finally hydrochloric acid-preserved containers for DRO analysis. Purge water was collected in five-gallon buckets. The Low Flow Sampling Data Logs are provided in Appendix A.

4.0 SAMPLING RESULTS

The samples were submitted to SGS North America, Inc. (SGS) laboratory in Anchorage, Alaska for sample analysis. The soil and groundwater results are described in further detail below.

4.1 Landfarm Soil Results

The 2019 and 2020 soils treated at the landfarm by KICC were comprised of primarily moist brown silty sand and gravel. All headspace sample results for the 2019 soil cell were 0.0 ppm, except for LF2019-4 which was 0.5 ppm. Headspace sample results for the 2020 soil cell ranged from 45.6 ppm to 162.8 ppm. Sample locations shown in Figure 2. A summary of the headspace samples, collected approximately 0.5 feet bgs, are shown below in Table 1.

Table 1 – Summary of Landfarm Soil Headspace Results

Field Sample ID	Headspace Result (ppmv)	Depth Below Ground Surface (feet)
Landfarm - 2019 Soils		
LF2019-1*	0	0.5
LF2019-2	0	0.5
LF2019-3	0	0.5
LF2019-4**	0.5	0.5
Landfarm - 2020 Soils		
LF2020-1	76.4 ~	0.5
LF2020-2	162.8 ~	0.5
LF2020-3	45.6 ~	0.5
LF2020-4	62.5 ~	0.5

Notes:

- * Analytical Sample Taken
- ** Analytical Primary and Duplicate Sample Taken
- ~ Hydrocarbon odor detected
- ppmv Parts Per Million by Volume

Per the ADEC-approved workplan, a total of two analytical soil samples, plus one duplicate, were collected on August 15, 2022 and analyzed. Analytical results are shown in Table 2. The laboratory report is provided in Appendix D.

Table 2 – Summary of 2019 Landfarm Soil Analytical Results

Analyte	Analysis	Unit	ADEC Cleanup Level*		2019 Landfarm Soils		
			MTG	HH/MAC	Sample ID **		
					LF2019-4	~ LF2019-44	LF2019-2
DRO	AK102	mg/kg	250	10250	239	162	167

Notes:

- * Tables B2, Migration to Groundwater (MTG) or Human Health (HH)/Maximum Allowable Concentration (MAC), Method Two Soil Cleanup Levels (18 AAC 75, November, 2021)
- ** Sample ID preceded by EMI's job number, 17855, on Chain of Custody
- ~ Duplicate Sample of Preceding Sample
- mg/kg Milligrams per kilogram
- 167** Detectable concentration reported in the project sample

4.2 Product Monitoring Results

Product monitoring of the ten wells was conducted during the August 2022 field event. On August 15, 2022, MW1 contained 0.03 feet of product, and MW6 had no standing liquid but did have a PID reading of 34.6 ppm at the top of the casing. Due to product presence, historical and current,

recovery socks (3-foot by 2-inch) were placed downhole these two wells, MW1 and MW6, and tied off to the well plug for passive product recovery (Photos 6 and 12). The socks will be removed and approximate volume recovered will be reported in the future monitoring event. The product interface probe did not indicate free product in the remaining eight wells.

4.3 Groundwater Monitoring Results

Water level measurements were collected from the site wells on August 15, 2022. A summary of the water level elevations and notable observations are provided in Table 3 below.

Table 3 –Groundwater Levels and Elevations

Well	Date	TOC Elevation (ft)	Total Well Depth (ft BTOC)	Depth to Water (ft BTOC)	Water Level Elevation (ft)	Notes
MW1	8/15/2022	8.62	7.8	2.48	6.14	0.03 ft of product
MW2	8/15/2022	10.05	7.90	2.99	7.06	
MW3	8/15/2022	9.54	8.2	2.97	6.57	
MW4	8/15/2022	9.17	12.5	2.72	6.45	
MW5	8/15/2022	9.27	7.0	3.74	5.53	
MW6	8/15/2022	9.33	-	-	-	obstruction at 4.3 ft BTOC
MW7	8/15/2022	10.50	12.7	4.91	5.59	
MW8	8/15/2022	10.06	14.3	3.40	6.66	
MW9	8/15/2022	8.42	6.6	2.20	6.20	-5.75 ft difference in Total Well Depth from 2021 observations
MW10	8/15/2022	9.28	9.2	2.75	6.53	-3.5 ft difference in Total Well Depth from 2021 observations

Notes:

ft Feet
 TOC Top of Casing
 BTOC Below Top of Casing

Note, the total well depth in Well MW9 was measured at 6.6 feet BTOC compared to 12.35 feet BTOC in 2021 observations. Also, Well MW10 measured at 9.2 feet BTOC compared to 2021 observations of 12.70 feet BTOC.

As shown on Figure 3, the groundwater direction appears to be to the west (IHS wells) and north (BIA wells).

Samples were collected from the eight of the ten groundwater monitoring wells on August 15 and 16, 2022. Analytical samples were not collected from Monitoring Wells MW1 and MW6 due to the presence of product and an obstruction, respectively. Groundwater analytical results are shown in Table 4. The laboratory report is provided in Appendix D.

Table 4 –Summary of Detectable Groundwater Analytical Results

Analyte	Analysis	Unit	Clean-up Level*	Sample ID**												Trip Blank
				MW2	MW5	MW55~	MW8	MW4	MW3	MW9	MW7	MW10	MW101~			
GRO	AK101	mg/L	2.2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.228	0.100 U	0.100 U	0.100 U	0.100 U	
DRO	AK102/103 LV	mg/L	1.5	0.600 U	2.44	2.87	0.625 U	1.70	0.625 U	16.4	1.56	7.39	7.39	-	-	
RRO	AK102/103 LV	mg/L	1.1	0.500 U	0.658	0.678	0.521 U	0.875	0.521 U	2.03	0.688	2.25	2.36	-	-	
Polycyclic Aromatic Hydrocarbons				-	-	-	-	-	-	-	-	-	-	-	-	
1-Methylnaphthalene	8270D SIM LV	ug/L	11	-	-	-	-	-	-	-	-	-	0.0943 J+	0.506 J+	-	
2-Methylnaphthalene	8270D SIM LV	ug/L	36	-	-	-	-	-	-	-	-	-	0.0521 UJ+	0.101 J+	-	
Acenaphthene	8270D SIM LV	ug/L	530	-	-	-	-	-	-	-	-	-	0.0937 J+	0.166 J+	-	
Fluorene	8270D SIM LV	ug/L	290	-	-	-	-	-	-	-	-	-	0.214 J+	0.295 J+	-	
Naphthalene	8270D SIM LV	ug/L	1.7	-	-	-	-	-	-	-	-	-	0.652 J+	2.54 J+	-	
Other PAHs	8270D SIM LV	ug/L	varies	-	-	-	-	-	-	-	-	-	ND	ND	-	
Volatile Organic Compounds				-	-	-	-	-	-	-	-	-	-	-	-	
1,2,3-Trichloropropane	SW8260D	ug/L	0.0075	<i>1.00 U J+</i>	<i>1.00 U J+</i>	<i>1.00 U J+</i>	<i>1.00 U</i>	<i>1.00 U</i>	<i>1.00 U</i>	<i>1.00 U</i>	<i>1.00 U</i>	<i>1.00 U</i>	<i>1.00 U</i>	<i>1.00 U</i>	<i>1.00 U</i>	
1,2,4-Trimethylbenzene	SW8260D	ug/L	56	1.00 U J+	10.4 J+	12.1 J+	1.00 U	1.00 U	1.00 U	35.6	1.00 U	4.58	4.90	1.00 U		
1,3,5-Trimethylbenzene	SW8260D	ug/L	60	1.00 U J+	4.36 J+	4.95 J+	1.00 U	1.00 U	1.00 U	40.7	1.00 U	2.73	2.92	1.00 U		
4-Isopropyltoluene	SW8260D	ug/L	-	1.00 U J+	1.00 U J+	1.00 U J+	1.00 U	1.00 U	1.00 U	21.2	1.00 U	1.43	1.52	1.00 U		
Benzene	SW8260D	ug/L	4.6	0.400 U J+	0.400 U J+	0.400 U J+	0.400 U	0.400 U	0.400 U	8.17	0.400 U	0.400 U	0.400 U	0.400 U		
Chloroform	SW8260D	ug/L	2.2	13.0 J+	1.00 U J+	1.00 U J+	9.50	1.00 U	1.00 U	2.49	1.00 U	1.00 U	1.00 U	1.00 U		
Dichlorodifluoromethane	SW8260D	ug/L	200	22.3 J+	17.2 J+	20.1 J+	3.82	2.47	8.05	8.20	1.62	1.00 U	1.00 U	1.00 U		
Ethylbenzene	SW8260D	ug/L	15	1.00 U J+	1.23 J+	1.37 J+	1.00 U	1.00 U	1.00 U	7.67	1.00 U	4.95	4.90	1.00 U		
Isopropylbenzene (Cumene)	SW8260D	ug/L	450	1.00 U J+	1.31 J+	1.46 J+	1.00 U	1.00 U	1.00 U	7.98	1.00 U	1.16	1.22	1.00 U		
Naphthalene	SW8260D	ug/L	1.7	1.00 U J+	29.9 J+	34.6 J+	1.00 U	1.00 U	1.00 U	65.0	1.00 U	15.6	16.7	1.00 U		
Trichlorofluoromethane	SW8260D	ug/L	5200	127 J+	57.4 J+	67.8 J+	18.1	10.7	33.4	28.1	1.00 U	1.00 U	1.00 U	1.00 U		
Xylenes (total)	SW8260D	ug/L	190	3.00 U J+	3.58 J+	4.04 J+	3.00 U	3.00 U	3.00 U	11.3	3.00 U	6.01	5.97	3.00 U		
n-Propylbenzene	SW8260D	ug/L	660	1.00 U J+	1.00 U J+	1.00 U J+	1.00 U	1.00 U	1.00 U	8.95	1.00 U	1.00	1.08	1.00 U		
sec-Butylbenzene	SW8260D	ug/L	2000	1.00 U J+	1.00 U J+	1.04 J+	1.00 U	1.00 U	1.00 U	6.65	1.00 U	1.00 U	1.00 U	1.00 U		
tert-Butylbenzene	SW8260D	ug/L	690	1.00 U J+	1.00 U J+	1.00 U J+	1.00 U	1.00 U	1.00 U	1.19	1.00 U	1.00 U	1.00 U	1.00 U		
Other VOCs	SW8260D	ug/L	varies	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		

Notes:	
*	ADEC Table C Groundwater Cleanup Levels (18 AAC 75, November, 2021)
**	Sample Number preceded by TC-EM JV Job Number, 17855, on Chain of Custody
~	Duplicate of preceding sample
0.400 U	Concentration not detected Above the Limit of Quantitation (LOQ)
1.00 U	Concentration not detected Above the LOQ, but LOQ is greater than the ADEC Cleanup Level
0.658	Detectable concentration reported in the project sample
65.0	Concentration greater than the ADEC Cleanup Level
mg/L	Milligrams per liter
ug/L	Micrograms per liter
-	Not applicable
J+	Result may be biased high due to quality control issues
ND	Not detected

5.0 DISCUSSION

A discussion of the results from the August 14 to 16, 2022 landfarm sampling and groundwater monitoring results are described in further detail below.

5.1 Landfarm Sampling Discussion

Four headspace and two analytical samples, plus a duplicate, were taken from the 2019 soil cell treated at the KIC Landfarm. Results indicate any remaining contamination in the soil is below ADEC Method Two Table B2 MTG cleanup levels.

Initial olfactory observations of the 2020 soil cell treated at the KIC Landfarm indicated a slight hydrocarbon odor. Four headspace samples were taken as an initial determination on presence of contamination. Headspace sample results, alongside hydrocarbon odors, indicated contamination present across the 2020 soils in elevated levels likely exceeding ADEC Method Two Table B2 MTG levels.

5.2 Groundwater Monitoring Discussion

Analytical samples were collected from eight of the ten site wells between August 15 and 16, 2022. Due to the presence of product in Well MW1 (0.03 foot) and an obstruction (4.3 feet BTOC) in Well MW6, analytical samples were not collected in these two wells.

Concentrations greater than the ADEC Table C Cleanup Levels were reported in each of the site wells except for Well MW3. These exceedances included DRO, RRO, naphthalene, benzene, and/or chloroform. The highest concentrations were typically encountered in the wells along the former pipeline (Wells MW5, MW9, and MW10). With the exception of Well MW9, DRO concentrations were similar or lower in the 2022 samples from the site wells than during previous events. The well is located downgradient of an active heavy equipment parking/repair/operations site (Lot 5) which has not undergone remediation. Further, the well is situated along the water/sewer/utility pipeline and fuel oil pipeline (still in place). This corridor has long been suspected to be a migration pathway due to the disturbed soil. Between the higher average groundwater levels and fact that Lot 5 has yet not been remediated, this could be contributing to the higher DRO levels observed in Well MW9.

Concentrations of several other analytes decreased since the 2021 sampling event, with the exception of RRO in Wells MW5, MW7, and MW9, and GRO in Wells MW10 and MW9 as well as 1,3,5-Trimethylbenzene and Naphthalene in MW9.

There was no PCE detected in the site wells, noting it was not included in the analytical suite in 2014 and 2015, with exceedances found during the 2020 sampling event in Wells MW3, MW4, MW7, and MW10. The source of the previously detected PCE is unknown. A historical table of groundwater sampling results is provided as Table 5. Graphs showing the DRO concentration trends are provided as Figure 4.

Table 5 –Historical Groundwater Sampling Results

		Contaminant of Concern and ADEC Table C Cleanup Level (units in mg/L)													
		GRO	DRO	RRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	PCE	Chloroform	1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Naphth (VOC)	1-Methyl naphth	2-Methyl naphth
Well	Date	2.2	1.5	1.1	0.0046	1.1	0.015	10	0.041	0.0022	0.056	0.03	0.0017	0.011	0.036
MW1~	8/25/2014	0.878	31.4	3.37	0.00134	0.00112	0.0333	0.118	-	-	-	-	-	-	-
MW1~	7/15/2015	2.01	20.7	1.81	0.0009	0.00114	0.0223	0.118	-	-	-	-	-	-	-
MW1	8/5/2019	Not sampled - Measurable Product													
MW1	9/30/2020	Not sampled - Measurable Product													
MW1	9/18/2021	Not sampled - Measurable Product													
MW1	8/15/2022	Not sampled - Measurable Product (product recovery sock inserted)													
MW2	8/25/2014	ND	ND	0.248 J	ND	ND	ND	ND	-	-	-	-	-	-	-
MW2	7/13/2015	1.4	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-
MW2	8/7/2019	ND	ND	ND	ND	ND	ND	ND	ND	0.0157	ND	ND	ND	-	-
MW2	10/3/2020	ND	0.922	0.875	ND	ND	ND	ND	0.0107 J-	0.0325 J-	ND	ND	ND	-	-
MW2~	9/19/2021	ND	ND	ND	ND	ND	ND	ND	ND	0.0139	ND	ND	ND	-	-
MW2	8/15/2022	ND	ND	ND	ND	ND	ND	ND	ND	0.0130	ND	ND	ND	-	-
MW3	8/26/2014	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-
MW3	7/13/2015	Not Sampled - Frozen													
MW3	8/7/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00971	-	-
MW3	10/3/2020	ND	0.647	ND	ND	ND	ND	ND	0.107 J-	ND	ND	ND	ND	-	-
MW3	9/19/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
MW3	8/15/2022	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
MW4	8/26/2014	0.136	3.53	0.461 J	ND	0.00039 J	0.00032 J	0.00170 J	-	-	-	-	-	-	-
MW4	7/14/2015	0.102	1.4	0.137 J	ND	ND	ND	ND	-	-	-	-	-	-	-
MW4	8/7/2019	ND	3.27	0.872	ND	ND	ND	ND	ND	ND	ND	0.0046	0.00258	-	-
MW4	10/3/2020	ND	5.6	0.995	ND	ND	ND	ND	0.0464 J-	ND	0.00146 J-	0.0107 J-	0.00321 J-	-	-
MW4	9/19/2021	ND	1.78	ND	ND	ND	ND	ND	ND	ND	ND	0.00492	ND	-	-
MW4	8/15/2022	ND	1.70	0.875	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
MW5	8/25/2014	0.188	5.44	1	ND	0.410 J	0.00304	0.0107	-	-	-	-	-	-	-
MW5	7/14/2015	Not Sampled - Frozen													
MW5	8/7/2019	0.125	3.89	0.663	0.00056	ND	0.00394	0.0108	ND	ND	0.0394	0.0197	0.057	-	-
MW5	10/4/2020	ND	6	1.1	-	-	-	-	-	-	-	-	-	-	-
MW5~	9/18/2021	0.191	2.97	ND	ND	ND	0.00334	0.00922	ND	ND	0.0371	0.0187	0.0642	-	-
MW5~	8/15/2022	ND	2.87	0.678	ND	ND	0.00137	0.00404	ND	ND	0.0121	0.00495	0.0346	-	-

Table 5 – Historical Groundwater Sampling Results Continued

		Contaminant of Concern and ADEC Table C Cleanup Level (units in mg/L)*													
		GRO	DRO	RRO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	PCE	Chloroform	1,2,4-Trimethyl-benzene	1,3,5-Trimethyl-benzene	Naphth (VOC)	1-Methyl naphth	2-Methyl naphth
Well	Date	2.2	1.5	1.1	0.0046	1.1	0.015	10	0.041	0.0022	0.056	0.03	0.0017	0.011	0.036
MW6	8/26/2014	0.373	4.84	0.757	ND	ND	0.00824	0.0189	-	-	-	-	-	-	-
MW6	7/14/2015	Not Sampled - Frozen													
MW6	8/7/2019	0.322	6.06	0.557	ND	ND	0.0121	0.0253	ND	ND	0.0631	0.0434	0.157	-	-
MW6	10/4/2020	Not Sampled - Trace Product													
MW6	9/18/2021	Not sampled - Measurable Product													
MW6	8/15/2022	Not sampled - Frozen (product recovery sock inserted)													
MW7	8/27/2014	0.0389 J	1.19	0.767	ND	0.00032 J	ND	ND	-	-	-	-	-	-	-
MW7	7/13/2015	0.0313 J	1	0.352 J	ND	ND	ND	ND	-	-	-	-	-	-	-
MW7	8/6/2019	ND	1.41	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
MW7~	10/3/2020	ND	1.56	0.933	ND	ND	ND	ND	0.0584 J-	ND	ND	ND	ND	-	-
MW7	9/19/2021	ND	1.55	0.548	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.000445	ND
MW7	8/15/2022	ND	1.56	0.688	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
MW8	8/26/2014	ND	0.2 J	0.298 J	ND	ND	ND	ND	-	-	-	-	-	-	-
MW8	7/13/2015	ND	0.35 J	0.276 J	ND	ND	ND	ND	-	-	-	-	-	-	-
MW8	8/6/2019	ND	ND	ND	0.00112	ND	ND	ND	ND	0.00484	ND	ND	ND	-	-
MW8	10/4/2020	ND	1.1	0.862	0.000620 J-	ND	ND	ND	0.0271 J-	0.00652 J-	ND	ND	ND	-	-
MW8	9/18/2021	ND	1.18	ND	0.000690	ND	ND	ND	ND	0.00948	ND	ND	ND	-	-
MW8	8/15/2022	ND	ND	ND	ND	ND	ND	ND	ND	0.00950	ND	ND	ND	-	-
MW9	8/27/2014	0.488	9.35	1.61	0.00605	0.00076 J	0.00475	0.0283	-	-	-	-	-	-	-
MW9	7/15/2015	0.634	9.02	1.27	0.00343	0.00056 J	0.00665	0.0365	-	-	-	-	-	-	-
MW9~	8/6/2019	0.263	12.8	1.36	0.012	ND	0.00787	0.0107	ND	ND	0.0584	0.0452	0.105	-	-
MW9	10/4/2020	0.373	13.7	1.87	0.0647 J-	ND	0.00753 J-	0.00919 J-	0.0381 J-	ND	0.040 J-	0.0390 J-	0.0841 J-	-	-
MW9	9/18/2021	0.290	14.5	1.31	0.00648	ND	0.00929	0.0114	ND	0.00331	0.0335	0.0371	0.0632	-	-
MW9	8/15/2022	0.228	16.4	2.03	0.00817	ND	0.00767	0.0113	ND	0.00249	0.0356	0.0407	0.0650	-	-
MW10	8/27/2014	0.843 J	14.8	1.95	0.0568	0.0166	0.0425	0.147	-	-	-	-	-	-	-
MW10	7/13/2015	0.543	11	1.63	0.0343	0.00197	0.0375	0.088	-	-	-	-	-	-	-
MW10	8/6/2019	ND	24.1	3.59	0.00083	ND	0.00744	0.00767	ND	ND	0.00854	0.00368	0.0266	ND	ND
MW10~	10/4/2020	0.261	17.9	2.74	0.0172 J-	ND	0.0245 J-	0.0287 J-	0.0975 J-	ND	0.0269 J-	0.0106 J-	0.0816 J-	0.0189	0.00326
MW10	9/18/2021	0.183	26.6	3.55	0.00132	ND	0.0167	0.0203	ND	ND	0.0149	0.00717	0.0504	-	-
MW10~	8/15/2022	ND	7.39	2.36	ND	ND	0.00495	0.00601	ND	ND	0.0049	0.00292	0.0167	0.000506	0.000101

Table 5 Notes:

*	Table C Groundwater Human Health Cleanup Level (18 AAC 75, November, 2021)
~	Duplicate sample collected; higher value between the primary and duplicate sample reported
-	Not applicable
J-	Quantitation is an estimation; potentially biased low
J	Quantitation is an estimation
mg/L	Milligrams per liter
ND	Not detected
0.261	Detectable concentration reported in the project sample
4.84	Above ADEC Table C Cleanup Level

5.3 Conceptual Site Model Discussion

A conceptual site model (CSM) was developed for Lots 3 and 4 as these two lots were the focus of the cleanup and priority for site closure. The Human Health Conceptual Site Model Graphic Form and Human Health Conceptual Site Model Scoping Form and Standardized Graphic are included in Appendix F.

The primary source of contamination at the site is the former fuel pipeline. In 2019 an UST and the former dispenser island was removed from Lot 4; due to the comingling of contamination from the pipeline, it is unknown whether the UST and former dispenser were significant sources of contamination for Lot 4. Drums were also encountered on Lot 4 during the 2020 removal action, but were empty at the time and appeared to have been used as an underground conveyance and no indication of petroleum impact from the drums were noted. The impacted media on Lots 3 and 4 are primarily surface and subsurface soils, and groundwater, noting there are no groundwater monitoring wells on Lot 4 but there are wells on the adjoining lots that have concentrations greater than cleanup levels. Due to the presence of volatile compounds in the soil and groundwater at the site, air is also a potentially impacted media.

The pathways that have been identified as complete in the CSM include: incidental soil ingestion, dermal absorption of contaminants from soil, inhalation of outdoor air, inhalation of indoor air, dermal absorption of contaminants in groundwater, and ingestion of groundwater.

Note, the drinking water sources for Kotzebue are surface water bodies, Vortac Lake and Devils Lake located greater than 2 miles southeast and topographically upgradient from the two lots, as shown on Figure 1. Kotzebue Sound, the closest surface water body to Lots 3 and 4, is not likely to be used as a future drinking water source. Due to a lack of a formal determination from the ADEC that surface water or groundwater is not a current or reasonably expected future source of drinking water per 18 AAC 75.350, ingestion of groundwater is considered a complete pathway.

Inhalation of indoor air is a potential pathway. There are several structures present between Lots 3 and 4. The FRF Building, located on Lot 4, is on pilings with the open space between the ground surface and structure. Therefore, inhalation of indoor air on Lot 4 is considered insignificant. On Lot 3, there are several residential structures. Volatile compounds were not encountered in the

2020 borings closest to Buildings 307, 312, 315, and 317. The closest boring with volatiles (naphthalene) was 2020 Boring B5. Boring B5 is 39 feet from Buildings 307 and 312. Although volatile compounds have been detected on Lot 3, the locations of those detections are over 30 horizontal feet from the residential structures on Lot 3.

The site is located in a mixed residential and business area. As a result, the current and future receptors will include residents, commercial or industrial workers, site visitors, trespassers, and construction workers.

6.0 QUALITY CONTROL REVIEW

ADEC Laboratory Data Review Checklists were completed for the SGS reports. The laboratory reports and checklists are included in Appendix D. The following is a summary of the quality control (QC) issues affecting data quality or usability.

6.1 SGS Report 1224988 Landfarm Soil Samples

No QC issues were noted.

6.2 SGS Report 1224980 Groundwater Samples

The following QC issues and the effect on data quality or usability were noted:

- Surrogate recovery for 1,2-dichloroethane-d4 (8260D) for MW2, MW5, MW55, Trip Blank, and MB (HBN 1842148) may be biased high. There were no detections for analytes associated with this surrogate in the trip blank indicating a negligible effect on results. Since many of these impacted project samples exceed ADEC cleanup levels, the recoveries are not likely to affect the data quality or usability for the project purpose of determining if concentrations exceed cleanup levels. The associated results in Table 4 have been flagged as potentially biased high.
- Surrogate recovery for 2-methylnaphthalene-d10 (8270D SIM) for MW10 and duplicate MW101 does not meet QC criteria. Since both of these impacted project samples exceed ADEC cleanup levels, the recoveries are not likely to affect the data quality or usability for the project purpose of determining if concentrations exceed cleanup levels. The associated results in Table 4 have been flagged as potentially biased high.
- The pH of project sample MW4 (AK101) was greater than two; however, the sample was analyzed within seven days of collection. Therefore, data usability is not affected.
- The LOQ for 1,2,3-trichloropropane exceeded the ADEC cleanup level. The analyte has similar results across all samples regardless of other contaminants present and a lower LOQ was not available for the method used on this project. The data is considered usable for the project purpose.

- The relative percent difference (RPD) is above the recommended 30% for five detected PAH compounds in MW10 and MW101. Analytical results for the five detected PAH compounds did not exceed cleanup levels, except for Naphthalene that was also detected in exceedance via SW8260D. Therefore, the elevated RPD is not likely to affect the data quality or usability for the project purpose of determining if concentrations exceed cleanup levels.

7.0 INVESTIGATIVE DERIVED WASTE MANAGEMENT

Investigation derived waste (IDW) included excavated soil, purge/decontamination water, the debris encountered during excavation, sampling disposables, and personal protective equipment (PPE).

- Purge/decontamination water generated during field activities was treated with a GAC filter and discharged onsite. The GAC filter is being stored for use in future monitoring events.
- Sample disposables including gloves, spoons, Ziplock bags, tubing from the groundwater monitoring, and other sampling disposables were disposed of as solid waste at the Kotzebue Landfill.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Landfarm sampling and groundwater monitoring were conducted in 2022. Below describes TC-EM JV's conclusions and recommendations for the entire site and for the lots previously occupied by IHS.

Contamination is present in the groundwater in each of the site's wells. The highest concentrations were typically encountered in Wells MW5, MW9, and MW10 with product encountered in Well MW 1 and suspected in MW6, all sample locations along the former pipeline corridor. Due to the detection of concentrations greater than cleanup levels of at least one analyte, we recommend continued groundwater monitoring of all the site wells to determine if concentrations are decreasing or stabilizing. In addition, the 2022 monitoring event did not encounter any PCE that was previously noted in the 2020 groundwater monitoring event. We recommend continued sampling for the full VOC suite during future monitoring events and the use of Teflon-lined sampling materials due to the prior presence of chlorinated solvents in the groundwater at the site.

Several VOC analytes has LOQs that exceed cleanup levels. Future groundwater monitoring events may include low-level VOC analyses that have lower detection limits, if available.

Measurable product continues to be encountered in Well MW1 and trace product or measurable product has been reported for Well MW6. We recommend continuing the product monitoring in Well MW1 and MW6, and continued passive product recovery if measurable product continues to be present in the wells. The volume of product recovered will be reported in future monitoring reports.

Due to the well depth discrepancies with Wells MW9 and MW10 in addition to the blockages in Well MW6, we recommend using a downhole camera during 2023 field activities to further investigate potential obstructions and/or damage to these wells.

The soils generated during the 2019 and 2020 field activities were tilled in 2021 and 2022. The soils in the 2019 landfarm cell were sampled and concentrations are below the ADEC Method Two Table B2 MTG cleanup level for DRO. Soils in the 2019 landfarm cell are now available for reuse. Post-treated soils will be managed per state regulations and guidance documents including an ADEC Transport and Treatment or Disposal of Contaminated Media Approval form.

The landfarm cell for the 2020-generated soil will continue to be tilled in 2023. If there is indication that the soils may have cleaned up (based on odors), the soil may be sampled late 2023 to determine if concentrations have reduced for reuse. GAC will continue to be used to treat water within the landfarm cell; the GAC breakthrough calculations will be provided to the ADEC prior to 2023 field work mobilization.

If you have any questions or wish to discuss this project further, please do not hesitate to contact Shayla Marshall at (907) 223-3544.

Tanana Commercial/Environmental Management LLC JV



Delaney Dent, EIT, QEP
Junior Engineer



Shayla Marshall, QEP
Project Manager

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VICINITY MAP

IHS BIA PIPELINE OIL SPILL
KOTZEBUE, AK

TC-EM JV

JOB NO: 17855
DRAWN: HJD
REVIEWED: SIM
DATE: 12/29/2021

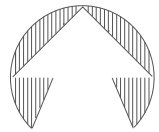
FIGURE

1

LEGEND

- △ HEADSPACE AND ANALYTICAL SAMPLE LOCATION
- HEADSPACE SAMPLE LOCATION WITH ELEVATED PID READINGS
- HEADSPACE SAMPLE LOCATION
- — APPROXIMATE SAMPLE GRID LAYOUT

North

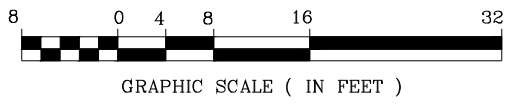


Access to unlined landfarm cells and Base Road



2019 Soil Cell
Approx. 16 cu. yds.
(Depth of soil ≈ 1 ft.)

2020 Soil Cell
Approx. 170 cu. yds.
(Depth of soil ≈ 1 ft.)



LANDFARM 2022 SAMPLE LOCATIONS

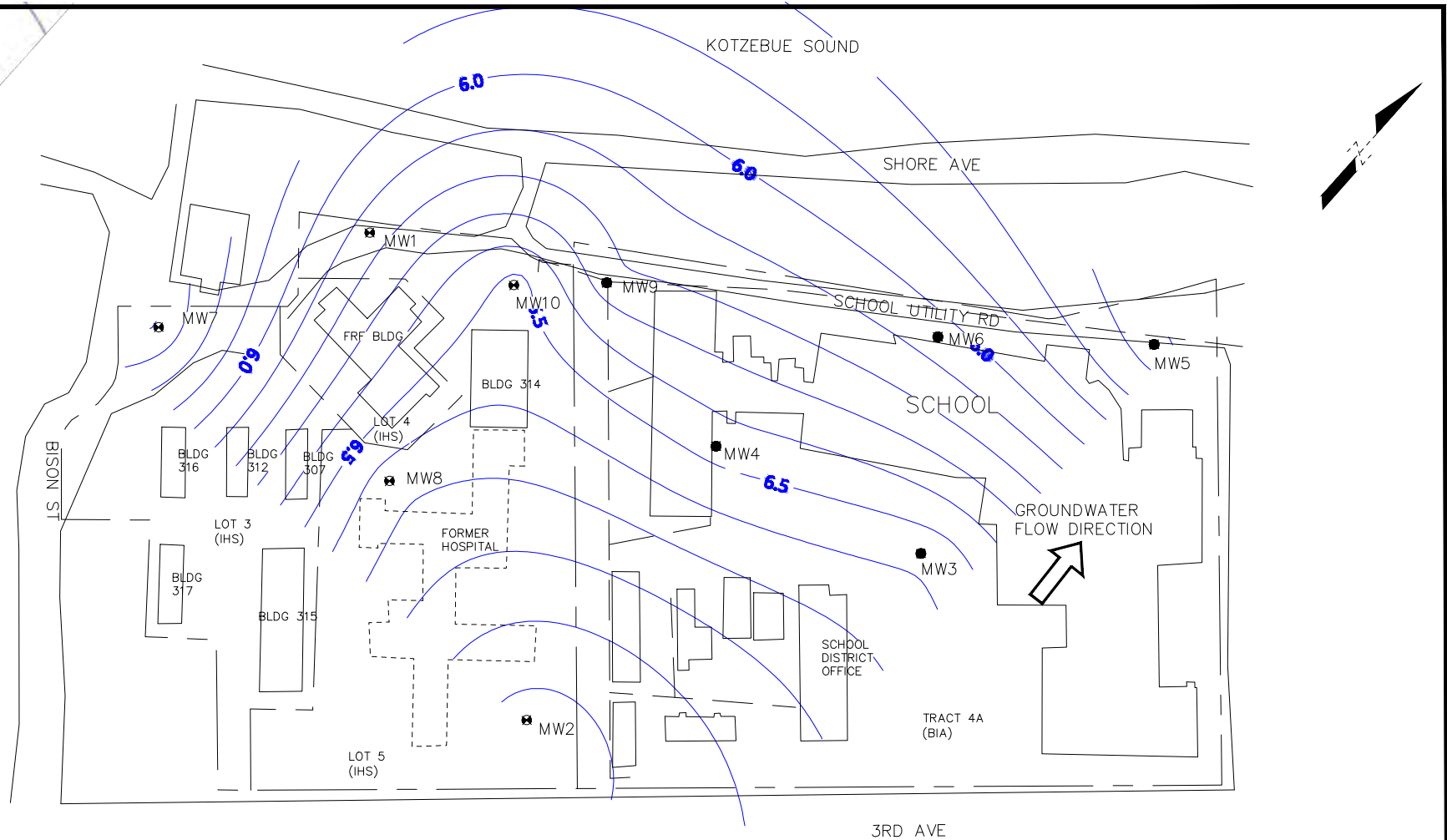
IHS BIA PIPELINE OIL SPILL
KOTZEBUE, AK

TC-EM JV

EMI JOB: 17855
DRAWN: DYD
REVIEWED: SIM
DATE: 12/21/2022

FIGURE
2

Responsible Party	
MW-1	IHS
MW-2	IHS
MW-3	BIA
MW-4	BIA
MW-5	BIA
MW-6	BIA
MW-7	IHS
MW-8	IHS
MW-9	BIA
MW-10	IHS



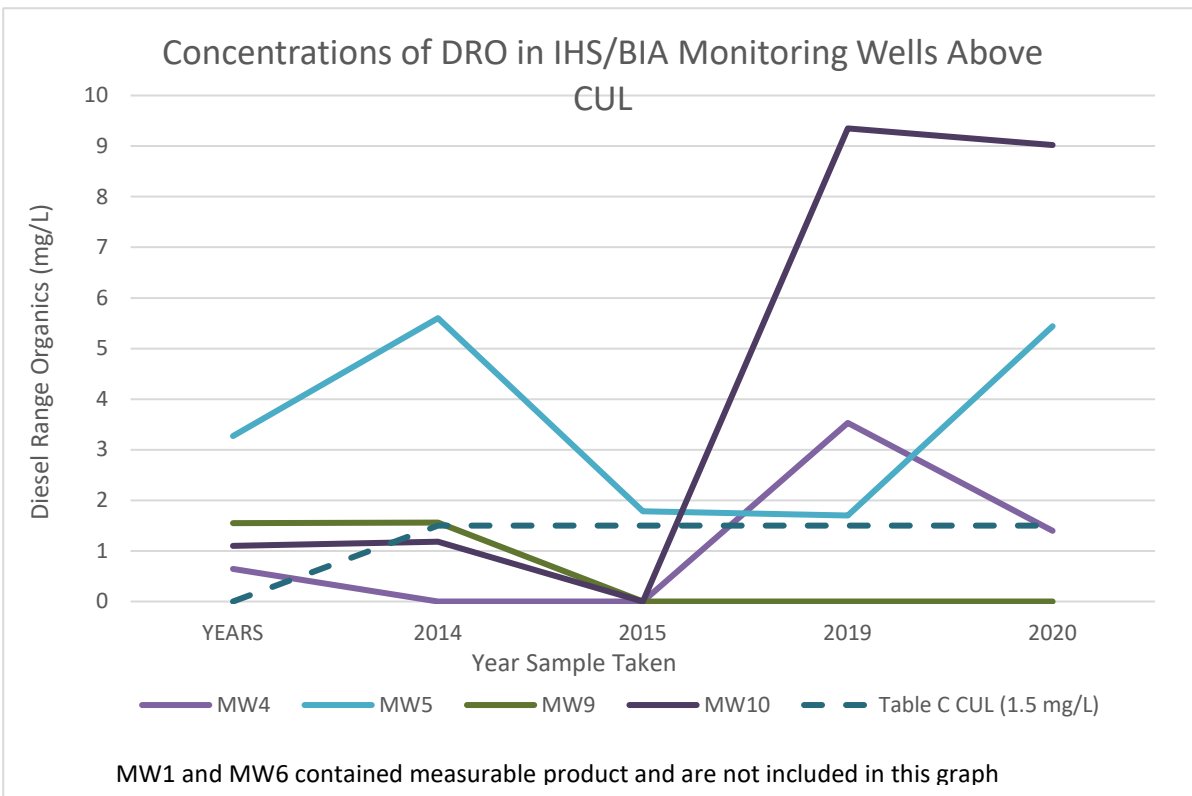
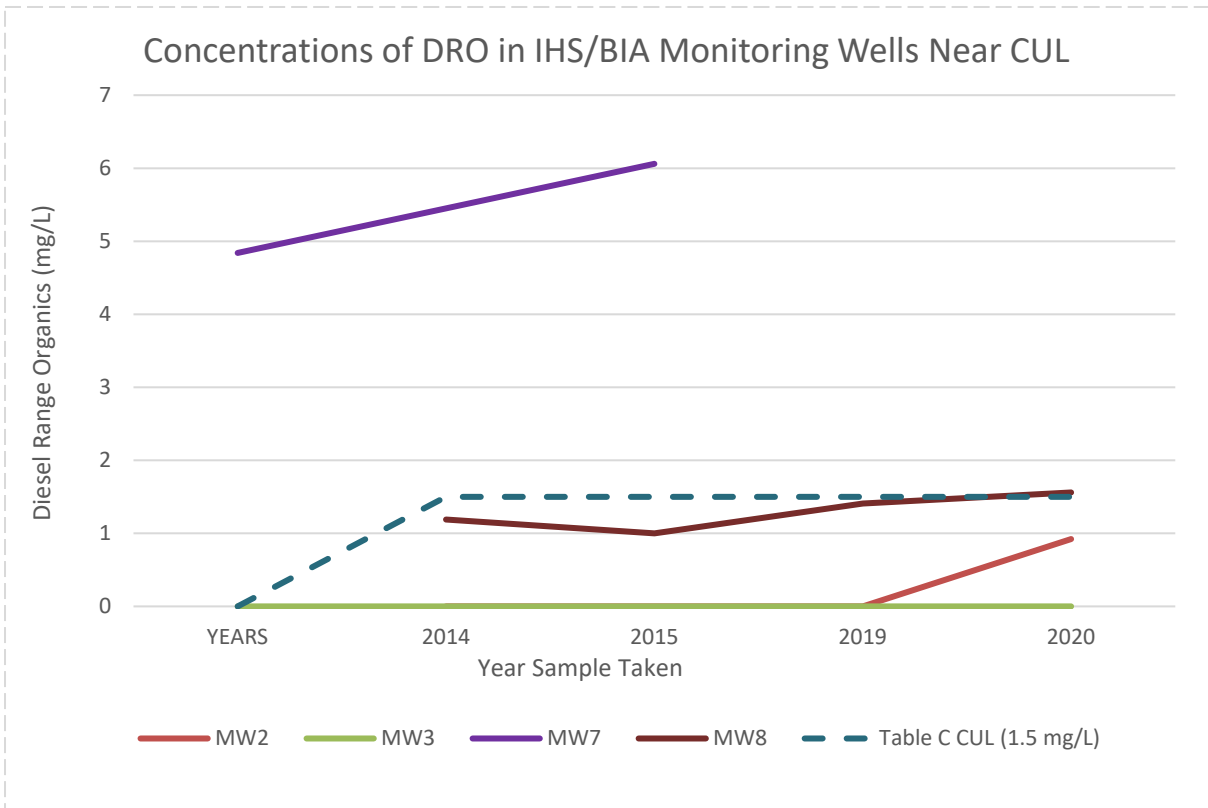
LEGEND

- FORMER STRUCTURE
- CURRENT STRUCTURE
- IHS MONITORING WELL LOCATION
- BIA MONITORING WELL LOCATION
- LOT LINES
- BIA PIPELINE (APPROXIMATE)



<p>GROUNDWATER MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATION CONTOURS</p>	<p>IHS BIA PIPELINE OIL SPILL KOTZEBUE, AK</p>	<p>TC-EM JV</p>	<p>JOB NO: 17855 DRAWN: HJD/DYD REVIEWED: SIM DATE: 10/28/2022</p>	<p>FIGURE 3</p>
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Figure 4 - Historical DRO Groundwater Concentrations



APPENDIX A

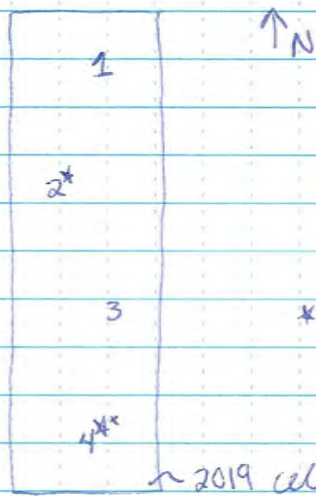
Field Notes

Aug. 14, 2022

Minikoe 3000 Cal 100.0 ppm Isobutylene
bump 100.4 ppm

Partly Cloudy, wind off the water, 50's F
EMI - Delaney
Tanana - Date

NTS



← water side

HSID	On/off	PID	depth	Notes
LF2019-1	2010/2033	0.0	6"	dk br, si sa grav, m
*LF2019-2	2013/2036	0.0	↓	↓
LF2019-3	2015/2037	0.0	↓	↓
*LF2019-4	2021/2037	0.5	↓	↓

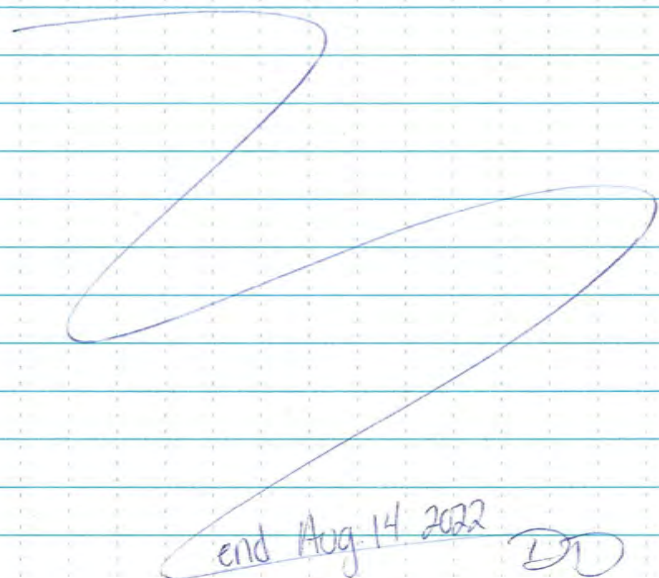
Scale: 1 square = _____

Aug. 14, 2022 13

HSID	On/off	PID	Depth	Notes
LF2020-1	2022/2038	76.4	6"	dk br, si sa grav, m, hc color
LF2020-2	2024/2039	162.8	↓	↓
LF2020-3	2026/2041	45.6	↓	↓
LF2020-4	2027/2043	62.5	↓	↓

Standing water was present due to recent rainfall

- sump area
- puddle near/on sac fill north side

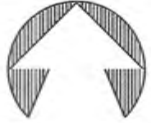


end Aug. 14 2022

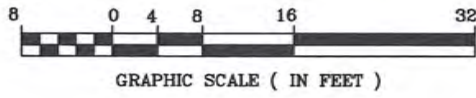
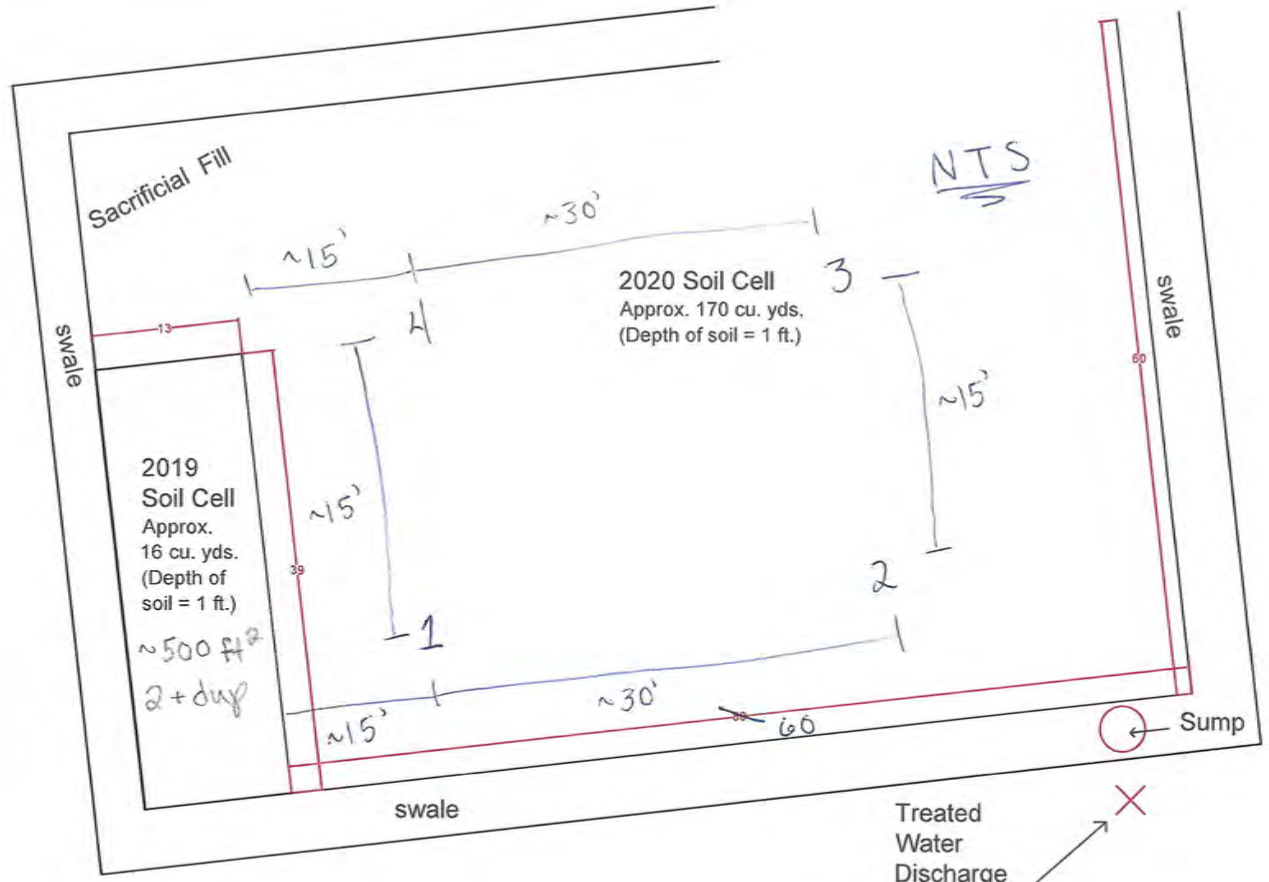
LD

Scale: 1 square = _____

North



grid each cell
approx. 10' x 10'
headspace from
center of each
grid



LANDFARM

IHS BIA PIPELINE OIL SPILL
KOTZEBUE, AK

TC-EM JV

EMI JOB: 17855
DRAWN: HJD/DYD
REVIEWED: SIM
DATE: 6/06/2022

FIGURE
3

Aug. 15, 2022

- Partly cloudy, wind off water, 40s°F
- 0800 NAC locked
- 0900 Retrieve rental car from RLC
- 0910 NAC pickup

2019 landfarm soil cell

17855-LF2019-4 @ 10:12

17855-LF2019-4A @ 10:22 (dup of 4)

17855-LF2019-2 @ 10:20

	d2P	d2W	Well depth	Notes	Time
MW1	2.45	2.48	7.8	Product	11:17
MW10	2.75	2.75	9.2		11:58
MW8	-	3.40	14.3		12:09
MW9	-	2.20	6.6	Bentonite on casing sides	12:40
MW7	-	4.91	12.7		12:57
MW2	-	2.99	7.9	buried under gravel	13:37
MW5	-	3.74	7.0		13:45
MW6	-	-	-		
MW4	-	2.72	12.5		15:11
MW3	-	2.97	8.2		15:20

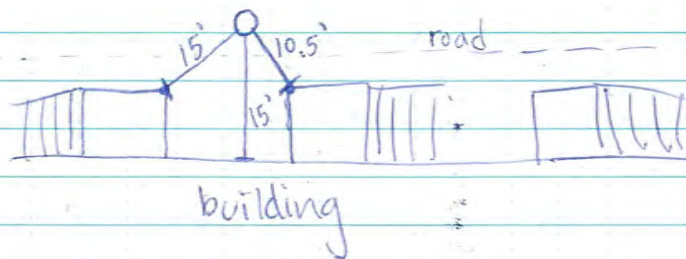
MW3 & 4 are on school recess grounds
- school is in session

Aug. 15, 2022 15

- put a 3' by 2" sock in well
 - floated on water
 - tied ~5' of string to well plug

used bailer to check water surface
no odor or sheen/product observed

MW6 ↑ N to water NTS



- PID inserted in MW6 @ 14:26 = 34.6 ppm
obstruction @ 4.3' damp, solid, no reading on water level meter
temp probe dropped to 40°F in ~5 min and steadily decreased
suspect ice → inserted sock



Low-Flow Sampling Water Data Log

Well No.: 2
 Project No.: 17855
 Instrument(s): _____

Date: Aug. 15, 2022
 Weather: partly cloudy, slight breeze, high 40s F
 EMI Staff: Delaney & Dale

Initial Well Parameters

Initial Depth to Water (ft): 2.97 Total Well Depth (ft): 7.9
 Product Present (if so, note thickness): N/A
 Pump placement (ft BTOC): 4'

Well Purge Details

Stabilization Criteria:			+/- 0.1 su	3%	3%	10%	10%	+/- 10 mv	0.33 ft
Time	Depth (ft)	Flow Rate (m ³ /min)	pH (s.u.)	Temp (°C)	Cond (µS/cm)	DO (%)	Turbidity (NTU)	ORP ()	Drawdown (ft)
16:15	4	180 200	6.86	4.72	630	6.9	25.07	35.5	—
16:19		200	6.88	4.95	629	7.2	18.16	37.5	—
16:22		200	6.91	5.10	631	8.5	14.06	34.1	—
16:25		450	6.90	4.78	620	10.9	7.35	32.3	—

Stable if min. of 3 parameters (4 if using temp) collected 3-5 min are within the criteria

Analytical Sample Details

Sample Collection Date/Time: 16:30 Duplicate Collected (Y/N): (N)
 Notes: _____
 Total volume purged: 2 gal



Low-Flow Sampling Water Data Log

Well No.: 5
 Project No.: 17855
 Instrument(s): _____

Date: Aug. 15 2022
 Weather: partly cloudy slight breeze
 EMI Staff: Delaney & Dale high 40sf

Initial Well Parameters

Initial Depth to Water (ft): 3.75' Total Well Depth (ft): 7.0
 Product Present (if so, note thickness): N/A
 Pump placement (ft BTOC): 4.8'

Well Purge Details

Stabilization Criteria:			+/- 0.1 su	3%	3%	10%	10%	+/- 10 mv	0.33 ft
Time	Depth (ft)	Flow Rate (ml/min)	pH (s.u.)	Temp (°C)	Cond (µS/cm)	DO (%)	Turbidity (NTU)	ORP ()	Drawdown (ft)
17:03	4.8	350	6.94	4.01	370	17.8	71.14	-12.0	—
17:07	↓	300	6.96	3.51	327	6.5	122.1	-3.7	—
17:11	↓	300	6.98	3.65	306	5.8	26.95	-7.6	—
17:15	↓	300	6.98	3.56	288	5.8	10.56	3.9	—
17:18	↓	300	6.98	3.67	285	5.1	8.77	7.7	—
17:21	↓	300	6.96	3.75	285	4.7	104.2	9.5	—

Stable if min. of 3 parameters (4 if using temp) collected 3-5 min are within the criteria

Analytical Sample Details

Sample Collection Date/Time: 17:25 17:35 Duplicate Collected (Y/N):
 Notes: mw5 mw55
 Total volume purged: 2 gal



Low-Flow Sampling Water Data Log

Well No.: 8 Date: Aug. 16, 2022
 Project No.: 17855 Weather: partly cloudy slight breeze 40sF
 Instrument(s): YST 556, MiniMorseon, low flow controller EMI Staff: Delaney & Dale
12v batt, interface probe, turbidimeter, teflon lined tubing
Initial Well Parameters

Initial Depth to Water (ft): 3.45 Total Well Depth (ft): 14.3
 Product Present (if so, note thickness): N/A
 Pump placement (ft BTOC): 4.5

Well Purge Details

Stabilization Criteria:			+/- 0.1 su	3%	3%	10%	10%	+/- 10 mv	0.33 ft
Time	Depth (ft)	Flow Rate (ml/min)	pH (s.u.)	Temp (°C)	Cond (µS/cm)	DO (%)	Turbidity (NTU)	ORP ()	Drawdown (ft)
8:05	4.5	400	6.31	2.75	506	19.4	29.17	209.0	
8:08	↓	500	6.72	2.57	493	10.0	18.23	189.8	—
8:12		300	6.86	2.41	491	6.4	20.73	182.0	—
8:15		400	6.90	2.56	494	5.6	1.66	176.5	0.01
8:18		300	6.92	2.48	492	4.8	0.55	173.4	—

Stable if min. of 3 parameters (4 if using temp) collected 3-5 min are within the criteria

Analytical Sample Details

Sample Collection Date/Time: 8-25 Duplicate Collected (Y/N): (N)
 Notes:
 Total volume purged: 1.5 gal



Low-Flow Sampling Water Data Log

Well No.: 4
 Project No.: 17855
 Instrument(s): _____

Date: Aug 16 2022
 Weather: partly cloudy, slight breeze, 40°F
 EMI Staff: Blavay & Dale

Initial Well Parameters

Initial Depth to Water (ft): 2.76 Total Well Depth (ft): 12.5
 Product Present (if so, note thickness): N/A
 Pump placement (ft BTOC): 4

Well Purge Details

Stabilization Criteria:			+/- 0.1 su	3%	3%	10%	10%	+/- 10 mv	0.33 ft
Time	Depth (ft)	Flow Rate (m ³ /min)	pH (s.u.)	Temp (°C)	Cond (µS/cm)	DO (%)	Turbidity (NTU)	ORP ()	Drawdown (ft)
8:59	4	300	6.60	5.54	548	8.6	14.48	173.8	
9:02	↓	300	6.70	5.68	554	6.9	1.00	147.0	0.01
9:05	↓	300	6.73	5.64	556	4.9	0.00	123.0	—
9:08	↓	300	6.75	5.61	555	4.2	0.91	91.5	—

Stable if min. of 3 parameters (4 if using temp) collected 3-5 min are within the criteria

Analytical Sample Details

Sample Collection Date/Time: 9:12 Duplicate Collected (Y/N): Y

Notes:

Total volume purged: 1.5 gal



Low-Flow Sampling Water Data Log

Well No.: 3
 Project No.: 17865
 Instrument(s): _____

Date: Aug. 16, 2022
 Weather: partly cloudy slight breeze, 40°
 EMI Staff: Delaney D Wade

Initial Well Parameters

Initial Depth to Water (ft): 3.01 Total Well Depth (ft): 8.2
 Product Present (if so, note thickness): N/A
 Pump placement (ft BTOC): 4

Well Purge Details

Stabilization Criteria:			+/- 0.1 su	3%	3%	10%	10%	+/- 10 mv	0.33 ft
Time	Depth (ft)	Flow Rate (ml/min)	pH (s.u.)	Temp (°C)	Cond (µS/cm)	DO (%)	Turbidity (NTU)	ORP ()	Drawdown (ft)
9:40	4	300	6.69	2.88	578	5.0	17.60	47.5	
9:43	↓	300	6.77	3.00	577	4.1	11.99	40.1	—
9:46	↓	300	6.80	3.11	572	4.1	13.18	33.2	—

Stable if min. of 3 parameters (4 if using temp) collected 3-5 min are within the criteria

Analytical Sample Details

Sample Collection Date/Time: 9:50 Duplicate Collected (Y/N):
 Notes:
 Total volume purged: 1 gal



Low-Flow Sampling Water Data Log

Well No.: 9
 Project No.: 17855
 Instrument(s): _____

Date: Aug. 16 2022
 Weather: partly cloudy, slight breeze, 40sF
 EMI Staff: Dale & Delaney

Initial Well Parameters

Initial Depth to Water (ft): 2.24 Total Well Depth (ft): 6.6
 Product Present (if so, note thickness): some bentonite spilled in casing, no product visible
 Pump placement (ft BTOC): 3.2

Well Purge Details

Stabilization Criteria:			+/- 0.1 su	3%	3%	10%	10%	+/- 10 mv	0.33 ft
Time	Depth (ft)	Flow Rate (ml/min)	pH (s.u.)	Temp (°C)	Cond (µS/cm)	DO (%)	Turbidity (NTU)	ORP ()	Drawdown (ft)
10:22	3.2	300	6.68	3.81	533	10.9	5.88	10.1	
10:25	↓	300	6.81	3.54	539	11.7	213.9 11.08	-12.4	—
10:28	↓	300	6.88	2.94	531	9.4	77.88	-32.9	0.11
10:31	↓	400	6.89	2.63	521	10.0	111.1	-35.2	0.01
10:34	↓	400	6.91	2.46	518	8.7	76.22	-34.0	0.02

Stable if min. of 3 parameters (4 if using temp) collected 3-5 min are within the criteria

Analytical Sample Details

Sample Collection Date/Time: 10:40 Duplicate Collected (Y/N):

Notes: high turb @ 10:25 due to sample not all the way inserted

Total volume purged: 1.5 gal



Low-Flow Sampling Water Data Log

Well No.: 7
 Project No.: 17855
 Instrument(s): _____

Date: Aug 16 2022
 Weather: partly cloudy, slight breeze, 40°F
 EMI Staff: Delaney & Dale

Initial Well Parameters

Initial Depth to Water (ft): 3.97 Total Well Depth (ft): 12.7
 Product Present (if so, note thickness): N/A
 Pump placement (ft BTOC): 5

Well Purge Details

Stabilization Criteria:			+/- 0.1 su	3%	3%	10%	10%	+/- 10 mv	0.33 ft
Time	Depth (ft)	Flow Rate (ml/min)	pH (s.u.)	Temp (°C)	Cond (µS/cm)	DO (%)	Turbidity (NTU)	ORP ()	Drawdown (ft)
11:21	5	300	6.87	3.88	542	10.0	51.53	38.6	
11:25	↓	300	6.99	3.86	514	17.0	32.60	26.6	
11:29	↓	300	7.02	3.90	503	19.7	22.44	21.3	
11:32	↓	300	7.04	3.96	499	19.4	14.48	20.3	

Stable if min. of 3 parameters (4 if using temp) collected 3-5 min are within the criteria

Analytical Sample Details

Sample Collection Date/Time: 11:37 Duplicate Collected (Y/N): _____

Notes: interface probe died after 1st (11:21) readings - ss flow

Total volume purged: 1.5 gal



Low-Flow Sampling Water Data Log

Well No.: 10
 Project No.: 17855
 Instrument(s): _____

Date: Aug. 16, 2022
 Weather: partly cloudy, slight breeze, 40s F
 EMI Staff: Delaney & Dale

Initial Well Parameters

Initial Depth to Water (ft): 0.97 Total Well Depth (ft): 9.2
 Product Present (if so, note thickness): N/A
 Pump placement (ft BTOC): 4

Well Purge Details

Stabilization Criteria:			+/- 0.1 su	3%	3%	10%	10%	+/- 10 mv	0.33 ft
Time	Depth (ft)	Flow Rate (ml/min)	pH (s.u.)	Temp (°C)	Cond (µS/cm)	DO (%)	Turbidity (NTU)	ORP ()	Drawdown (ft)
1300	4	300	6.53	4.66	509	7.3	17.26	136.0	
1303	↓	300	6.62	4.28	501	6.9	5.75	70.0	0.73
1306	↓	300	6.67	3.99	500	8.4	2.34	20.2	—
1309	↓	300	6.68	4.01	505	7.0	1.95	-3.3	—
1312	↓	300	6.68	4.09	510	5.0	0.00 1.27	-25.3	—
1316	↓	300	6.69	4.08	512	5.3	0.49	-28.9	—
1319	↓	300	6.69	4.12	512	4.9 ₀₀	0.16	-24.4	—

Stable if min. of 3 parameters (4 if using temp) collected 3-5 min are within the criteria

Analytical Sample Details

Sample Collection Date/Time: 13:35 13:45 * Duplicate Collected (Y/N) ^{+PAH}
 Notes: MW10 MW101
 Total volume purged: 2.5 gal

APPENDIX B

Photo Pages

2022 Landfarm Sampling and Groundwater Monitoring Photo Log



Photo 1: KIC Landfarm: 2020 soil cell in center. 2019 soil cell right of the centerline. GAC filtration system in back left corner. *facing south* (August 14, 2022)

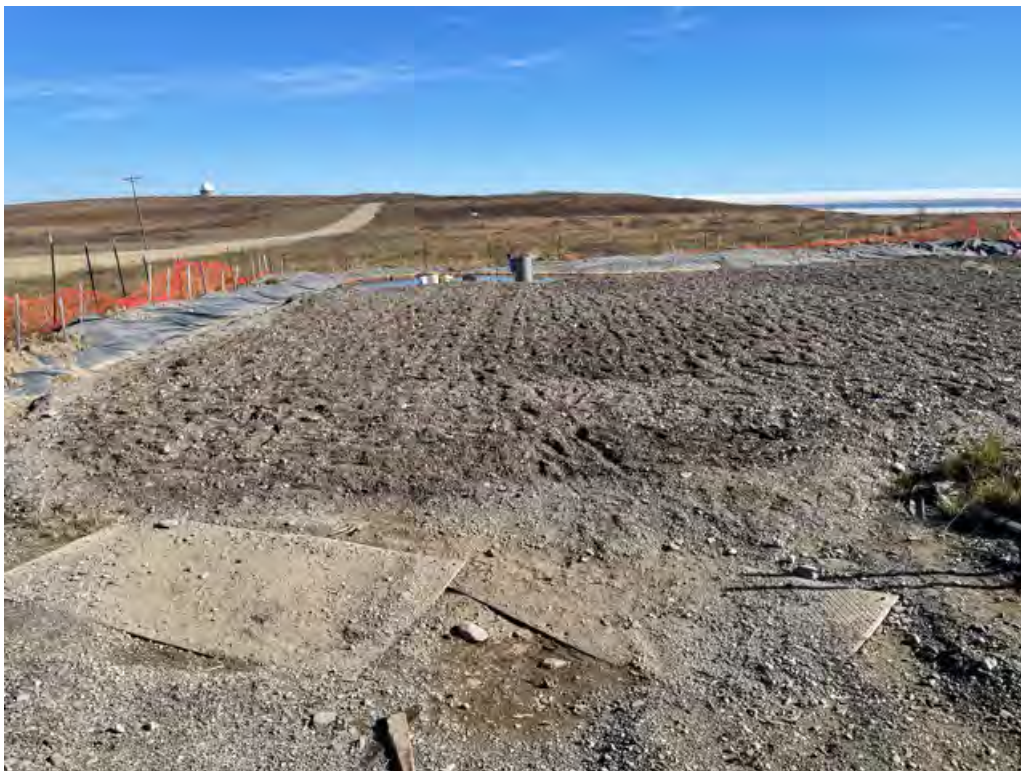


Photo 2: KIC Landfarm: Post tilling and nutrient addition to 2019 and 2020 soil cells. *facing south* (June 8, 2022)

2022 Landfarm Sampling and Groundwater Monitoring Photo Log



Photo 3: KIC Landfarm: 2019 soil cell bordering the 2020 soil cell along the left side. *facing south* (August 15, 2022)



Photo 4: KIC Landfarm: GAC system after recent rainfall event. *facing southeast* (August 15, 2022)

2022 Landfarm Sampling and Groundwater Monitoring Photo Log



Photo 5: Monitoring Well MW1 located along a dirt road. *facing west.* (August 15, 2022)



Photo 6: Monitoring Well MW1 had a 3-foot long by 2-inch diameter sorbent sock placed downhole and tied off to the well plug. (August 15, 2022)

2022 Landfarm Sampling and Groundwater Monitoring Photo Log



Photo 7: Monitoring Well MW2 located in a parking lot near the fence line. *facing northwest.* (August 15, 2022)



Photo 8: Monitoring Well MW3 located in the school playground. *facing northwest.* (August 15, 2022)

2022 Landfarm Sampling and Groundwater Monitoring Photo Log



Photo 9: Monitoring Well MW4 located in the school playground along the wall. *facing southeast.* (August 15, 2022)



Photo 10: Monitoring Well MW5 located along a dirt road near a conex. *facing south.* (August 15, 2022)

2022 Landfarm Sampling and Groundwater Monitoring Photo Log



Photo 11: Monitoring Well MW6 located in a pothole along the school backroad. *facing southeast.* (August 15, 2022)



Photo 12: Monitoring Well MW6 located in a pothole along the school backroad. Water was originally above the well cap in the pothole. A sorbent sock, tied off to the well plug, was placed downhole. *facing northeast.* (August 15, 2022)

2022 Landfarm Sampling and Groundwater Monitoring Photo Log



Photo 13: Monitoring Well MW7 located in a parking lot. *facing southwest.* (August 15, 2022)



Photo 14: Monitoring Well MW8 located underneath a traffic cone. *facing west.* (August 15, 2022)

2022 Landfarm Sampling and Groundwater Monitoring Photo Log



Photo 15: Monitoring Well MW9 located at the end of the road near the school. Bentonite had swelled above the well cap upon opening. (August 15, 2022)



Photo 16: Monitoring Well MW10 located underneath a tire. (August 15, 2022)

APPENDIX C

Disposal Documentation



**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites and Prevention Preparedness and Response Programs**

Contaminated Media Transport and Treatment or Disposal Approval Form

HAZARD ID # or SPILL ID #	NAME OF CONTAMINATED SITE OR SPILL	
25558	Kotzebue Former IHS/BIA Hospital – School Pipeline Release	
CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION		
Kotzebue Former IHS/BIA Hospital – School Pipeline Release, Kotzebue, Alaska		
CURRENT PHYSICAL LOCATION OF MEDIA	SOURCE OF THE CONTAMINATION (DAY TANK, FIRE TRAINING PIT, LUST, ETC.)	
See below comments	tank releases, damaged fuel line, tank overfills, other sources	
CONTAMINANTS OF CONCERN	ESTIMATED VOLUME	DATE(S) GENERATED
GRO, DRO, RRO, VOCs, PAH	1- 5-gallon GAC Filter	week of August 15, 2022
POST TREATMENT ANALYSIS REQUIRED (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)		
To be conducted at future disposal request		
COMMENTS OR OTHER IMPORTANT INFORMATION		
TC-EM JV will be utilizing a GAC filter to treat the purgewater. This filter may be stored on site for future use or brought back to EMI's office in Anchorage for temporary storage until the next field effort. An updated transport request form will be provided at the time of disposal.		

TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA	PHYSICAL ADDRESS/PHONE NUMBER
Temporary storage for reuse - EMI	206 E Fireweed Lane, Suite 201, Anchorage, AK 99503/907-272-9336
RESPONSIBLE PARTY	ADDRESS/PHONE NUMBER
Indian Health Services / Frank Chua	701 5th Ave, Ste 1600, Seattle, WA 98104; (206) 615-2447
WASTE MANAGEMENT CO. / ORGANIZER	ADDRESS/PHONE NUMBER
TC-EM JV / Shayla Marshall	206 E Fireweed Lane, Suite 201, Anchorage, AK 99503/907-272-9336

*Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.

Shayla Marshall

Name of the Person Requesting Approval (printed)

Signature

Project Manager / TC-EM JV

Title/Association

8/17/2022

Date

907-223-3544

Phone Number

-----DEC USE ONLY-----

Based on the information provided, ADEC approves transport of the above mentioned material. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported and a post treatment analytical report, if disposed of at an approved treatment facility. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

Kelly L Walker

DEC Project Manager Name (printed)

Signature

Environmental Program Specialist 3

Project Manager Title

08/17/2022

Date

(907) 451-2166

Phone Number

APPENDIX D

SGS Laboratory Reports and Laboratory Data Review Checklists



Laboratory Report of Analysis

To: Environmental Mgmt Inc (EMI)
206 East Fireweed Lane Suite 201
Anchorage, AK 99503
907-272-9336

Report Number: **1224980**

Client Project: **17855 Kotzebue Monitoring Well**

Dear Delaney Dent,

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 Danika 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.

2022.09.22 11:48:01
-08'00'

Danika Buzby-Rynders
Project Manager
Danika.Buzby-Rynders@sgs.com

Date

Case Narrative

SGS Client: **Environmental Mgmt Inc (EMI)**
SGS Project: **1224980**
Project Name/Site: **17855 Kotzebue Monitoring Well**
Project Contact: **Delaney Dent**

Refer to sample receipt form for information on sample condition.

17855-MW2 (1224980001) PS

8260D – Surrogate recovery for 1,2-dichloroethane-d4 does not meet QC criteria (biased high). Analytes associated with this surrogate may be biased high.

17855-MW5 (1224980002) PS

8260D – Surrogate recovery for 1,2-dichloroethane-d4 does not meet QC criteria (biased high). Analytes associated with this surrogate may be biased high.

17855-MW55 (1224980003) PS

8260D – Surrogate recovery for 1,2-dichloroethane-d4 does not meet QC criteria (biased high). Analytes associated with this surrogate may be biased high.

17855-MW4 (1224980005) PS

AK101 - Sample has a pH greater than two; however, the sample was analyzed within 7 days from collection.

17855-MW10 (1224980009) PS

8270D SIM - PAH Surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria.

Trip Blank (1224980010) TB

8260D – Surrogate recovery for 1,2-dichloroethane-d4 does not meet QC criteria (biased high). Analytes associated with this surrogate may be biased high.

17855-MW101 (1224980011) PS

8270D SIM - PAH Surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria.

MB for HBN 1842148 [VXX/39066] (1681858) MB

8260D – Surrogate recovery for 1,2-dichloroethane-d4 does not meet QC criteria (biased high). Analytes associated with this surrogate may be biased high.

*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

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
8270D SIM LV (PAH)				
1224980009	17855-MW10	XMS13319	Benzo[k]fluoranthene	BLC
1224980009	17855-MW10	XMS13319	Fluorene	BLC
1224980011	17855-MW101	XMS13319	Acenaphthylene	BLC
SW8260D				
1224980002	17855-MW5	VMS21905	4-Isopropyltoluene	SP
1224980002	17855-MW5	VMS21905	n-Butylbenzene	SP
1224980003	17855-MW55	VMS21905	4-Isopropyltoluene	SP
1224980003	17855-MW55	VMS21905	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.

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, indemnification 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) & 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 and, when applicable, other regulatory authorities.

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

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
17855-MW2	1224980001	08/15/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW5	1224980002	08/15/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW55	1224980003	08/15/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW8	1224980004	08/16/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW4	1224980005	08/16/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW3	1224980006	08/16/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW9	1224980007	08/16/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW7	1224980008	08/16/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW10	1224980009	08/16/2022	08/19/2022	Water (Surface, Eff., Ground)
Trip Blank	1224980010	08/15/2022	08/19/2022	Water (Surface, Eff., Ground)
17855-MW101	1224980011	08/16/2022	08/19/2022	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
AK103	DRO/RRO Low Volume Water
SW8260D	Volatile Organic Compounds (W) FULL
8270D SIM LV (PAH)	8270 PAH SIM GC/MS LV
AK101	Gasoline Range Organics (W)
AK102	DRO/RRO Low Volume Water

Print Date: 09/21/2022 1:57:51PM

Detectable Results Summary

Client Sample ID: **17855-MW2**

Lab Sample ID: 1224980001

Volatile GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Chloroform	13.0	ug/L
Dichlorodifluoromethane	22.3	ug/L
Trichlorofluoromethane	127	ug/L

Client Sample ID: **17855-MW5**

Lab Sample ID: 1224980002

Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2.44	mg/L
Residual Range Organics	0.658	mg/L

Volatile GC/MS

1,2,4-Trimethylbenzene	10.4	ug/L
1,3,5-Trimethylbenzene	4.36	ug/L
Dichlorodifluoromethane	17.2	ug/L
Ethylbenzene	1.23	ug/L
Isopropylbenzene (Cumene)	1.31	ug/L
Naphthalene	29.9	ug/L
P & M -Xylene	2.93	ug/L
Trichlorofluoromethane	57.4	ug/L
Xylenes (total)	3.58	ug/L

Client Sample ID: **17855-MW55**

Lab Sample ID: 1224980003

Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	2.87	mg/L
Residual Range Organics	0.678	mg/L

Volatile GC/MS

1,2,4-Trimethylbenzene	12.1	ug/L
1,3,5-Trimethylbenzene	4.95	ug/L
Dichlorodifluoromethane	20.1	ug/L
Ethylbenzene	1.37	ug/L
Isopropylbenzene (Cumene)	1.46	ug/L
Naphthalene	34.6	ug/L
P & M -Xylene	3.31	ug/L
sec-Butylbenzene	1.04	ug/L
Trichlorofluoromethane	67.8	ug/L
Xylenes (total)	4.04	ug/L

Client Sample ID: **17855-MW8**

Lab Sample ID: 1224980004

Volatile GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Chloroform	9.50	ug/L
Dichlorodifluoromethane	3.82	ug/L
Trichlorofluoromethane	18.1	ug/L

Client Sample ID: **17855-MW4**

Lab Sample ID: 1224980005

Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1.70	mg/L
Residual Range Organics	0.875	mg/L

Volatile GC/MS

Dichlorodifluoromethane	2.47	ug/L
Trichlorofluoromethane	10.7	ug/L

Detectable Results Summary

Client Sample ID: **17855-MW3**

Lab Sample ID: 1224980006

Volatile GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dichlorodifluoromethane	8.05	ug/L
Trichlorofluoromethane	33.4	ug/L

Client Sample ID: **17855-MW9**

Lab Sample ID: 1224980007

Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	16.4	mg/L
Residual Range Organics	2.03	mg/L

Volatile Fuels

Volatile GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Gasoline Range Organics	0.228	mg/L
1,2,4-Trimethylbenzene	35.6	ug/L
1,3,5-Trimethylbenzene	40.7	ug/L
4-Isopropyltoluene	21.2	ug/L
Benzene	8.17	ug/L
Chloroform	2.49	ug/L
Dichlorodifluoromethane	8.20	ug/L
Ethylbenzene	7.67	ug/L
Isopropylbenzene (Cumene)	7.98	ug/L
Naphthalene	65.0	ug/L
n-Propylbenzene	8.95	ug/L
P & M -Xylene	10.9	ug/L
sec-Butylbenzene	6.65	ug/L
tert-Butylbenzene	1.19	ug/L
Trichlorofluoromethane	28.1	ug/L
Xylenes (total)	11.3	ug/L

Client Sample ID: **17855-MW7**

Lab Sample ID: 1224980008

Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1.56	mg/L
Residual Range Organics	0.688	mg/L

Volatile GC/MS

Dichlorodifluoromethane	1.62	ug/L
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Detectable Results Summary

Client Sample ID: **17855-MW10**

Lab Sample ID: 1224980009

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.0943	ug/L
Acenaphthene	0.0937	ug/L
Fluorene	0.214	ug/L
Naphthalene	0.652	ug/L
Semivolatile Organic Fuels		
Diesel Range Organics	7.39	mg/L
Residual Range Organics	2.25	mg/L
Volatile GC/MS		
1,2,4-Trimethylbenzene	4.58	ug/L
1,3,5-Trimethylbenzene	2.73	ug/L
4-Isopropyltoluene	1.43	ug/L
Ethylbenzene	4.95	ug/L
Isopropylbenzene (Cumene)	1.16	ug/L
Naphthalene	15.6	ug/L
n-Propylbenzene	1.00	ug/L
P & M -Xylene	6.01	ug/L
Xylenes (total)	6.01	ug/L

Client Sample ID: **17855-MW101**

Lab Sample ID: 1224980011

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.506	ug/L
2-Methylnaphthalene	0.101	ug/L
Acenaphthene	0.166	ug/L
Fluorene	0.295	ug/L
Naphthalene	2.54	ug/L
Semivolatile Organic Fuels		
Diesel Range Organics	7.39	mg/L
Residual Range Organics	2.36	mg/L
Volatile GC/MS		
1,2,4-Trimethylbenzene	4.90	ug/L
1,3,5-Trimethylbenzene	2.92	ug/L
4-Isopropyltoluene	1.52	ug/L
Ethylbenzene	4.90	ug/L
Isopropylbenzene (Cumene)	1.22	ug/L
Naphthalene	16.7	ug/L
n-Propylbenzene	1.08	ug/L
P & M -Xylene	5.97	ug/L
Xylenes (total)	5.97	ug/L



Results of 17855-MW2

Client Sample ID: 17855-MW2
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980001
Lab Project ID: 1224980

Collection Date: 08/15/22 16:30
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 15:39
Container ID: 1224980001-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62 (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 15:39
Container ID: 1224980001-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW2

Client Sample ID: **17855-MW2**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980001
Lab Project ID: 1224980

Collection Date: 08/15/22 16:30
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/22/22 22:47
Surrogates							
4-Bromofluorobenzene (surr)	68.2	50-150		%	1		08/22/22 22:47

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/22/22 22:47
Container ID: 1224980001-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW2

Client Sample ID: **17855-MW2**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980001
 Lab Project ID: 1224980

Collection Date: 08/15/22 16:30
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:36
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:36
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		08/24/22 15:36
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:36
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		08/24/22 15:36
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,2-Dichloroethane	0.500 U	0.500	0.200	ug/L	1		08/24/22 15:36
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:36
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:36
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:36
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:36
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:36
Benzene	0.400 U	0.400	0.120	ug/L	1		08/24/22 15:36
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:36
Bromoform	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
Bromomethane	6.00 U	6.00	3.00	ug/L	1		08/24/22 15:36
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:36
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:36
Chloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:36

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW2

Client Sample ID: 17855-MW2
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980001
Lab Project ID: 1224980

Collection Date: 08/15/22 16:30
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical parameters like Chloroform, Benzene, and Toluene with their respective results and limits.

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW2**

Client Sample ID: **17855-MW2**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980001
Lab Project ID: 1224980

Collection Date: 08/15/22 16:30
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21905
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 15:36
Container ID: 1224980001-D

Prep Batch: VXX39066
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW5

Client Sample ID: 17855-MW5
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980002
Lab Project ID: 1224980

Collection Date: 08/15/22 17:35
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 15:49
Container ID: 1224980002-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62 (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 15:49
Container ID: 1224980002-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW5**

Client Sample ID: **17855-MW5**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980002
Lab Project ID: 1224980

Collection Date: 08/15/22 17:35
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/23/22 00:37
Surrogates							
4-Bromofluorobenzene (surr)	83	50-150		%	1		08/23/22 00:37

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/23/22 00:37
Container ID: 1224980002-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW5

Client Sample ID: **17855-MW5**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980002
 Lab Project ID: 1224980

Collection Date: 08/15/22 17:35
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:51
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:51
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		08/24/22 15:51
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,2,4-Trimethylbenzene	10.4	1.00	0.310	ug/L	1		08/24/22 15:51
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:51
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		08/24/22 15:51
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,2-Dichloroethane	0.500 U	0.500	0.200	ug/L	1		08/24/22 15:51
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,3,5-Trimethylbenzene	4.36	1.00	0.310	ug/L	1		08/24/22 15:51
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:51
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:51
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:51
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:51
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:51
Benzene	0.400 U	0.400	0.120	ug/L	1		08/24/22 15:51
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:51
Bromoform	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
Bromomethane	6.00 U	6.00	3.00	ug/L	1		08/24/22 15:51
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:51
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:51
Chloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:51

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW5

Client Sample ID: **17855-MW5**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980002
 Lab Project ID: 1224980

Collection Date: 08/15/22 17:35
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
Chloromethane	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
cis-1,2-Dichloroethene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
cis-1,3-Dichloropropene	0.500	U	0.500	0.150	ug/L	1		08/24/22 15:51
Dibromochloromethane	0.500	U	0.500	0.150	ug/L	1		08/24/22 15:51
Dibromomethane	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
Dichlorodifluoromethane	17.2		1.00	0.310	ug/L	1		08/24/22 15:51
Ethylbenzene	1.23		1.00	0.310	ug/L	1		08/24/22 15:51
Freon-113	10.0	U	10.0	3.10	ug/L	1		08/24/22 15:51
Hexachlorobutadiene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
Isopropylbenzene (Cumene)	1.31		1.00	0.310	ug/L	1		08/24/22 15:51
Methylene chloride	10.0	U	10.0	3.10	ug/L	1		08/24/22 15:51
Methyl-t-butyl ether	10.0	U	10.0	3.10	ug/L	1		08/24/22 15:51
Naphthalene	29.9		1.00	0.310	ug/L	1		08/24/22 15:51
n-Butylbenzene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
n-Propylbenzene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
o-Xylene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
P & M -Xylene	2.93		2.00	0.620	ug/L	1		08/24/22 15:51
sec-Butylbenzene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
Styrene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
tert-Butylbenzene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
Tetrachloroethene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
Toluene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
trans-1,2-Dichloroethene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
trans-1,3-Dichloropropene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
Trichloroethene	1.00	U	1.00	0.310	ug/L	1		08/24/22 15:51
Trichlorofluoromethane	57.4		1.00	0.310	ug/L	1		08/24/22 15:51
Vinyl acetate	10.0	U	10.0	3.10	ug/L	1		08/24/22 15:51
Vinyl chloride	0.150	U	0.150	0.0500	ug/L	1		08/24/22 15:51
Xylenes (total)	3.58		3.00	1.00	ug/L	1		08/24/22 15:51
Surrogates								
1,2-Dichloroethane-D4 (surr)	129	*	81-118		%	1		08/24/22 15:51
4-Bromofluorobenzene (surr)	90.1		85-114		%	1		08/24/22 15:51
Toluene-d8 (surr)	93.7		89-112		%	1		08/24/22 15:51

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW5**

Client Sample ID: **17855-MW5**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980002
Lab Project ID: 1224980

Collection Date: 08/15/22 17:35
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21905
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 15:51
Container ID: 1224980002-D

Prep Batch: VXX39066
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW55**

Client Sample ID: **17855-MW55**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980003
Lab Project ID: 1224980

Collection Date: 08/15/22 17:25
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	2.87	0.625	0.208	mg/L	1		08/28/22 15:59
Surrogates							
5a Androstane (surr)	90.5	50-150		%	1		08/28/22 15:59

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 15:59
Container ID: 1224980003-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.678	0.521	0.208	mg/L	1		08/28/22 15:59
Surrogates							
n-Triacontane-d62 (surr)	105	50-150		%	1		08/28/22 15:59

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 15:59
Container ID: 1224980003-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW55

Client Sample ID: **17855-MW55**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980003
Lab Project ID: 1224980

Collection Date: 08/15/22 17:25
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/23/22 16:42
Surrogates							
4-Bromofluorobenzene (surr)	88.5	50-150		%	1		08/23/22 16:42

Batch Information

Analytical Batch: VFC16228
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/23/22 16:42
Container ID: 1224980003-A

Prep Batch: VXX39054
Prep Method: SW5030B
Prep Date/Time: 08/23/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW55

Client Sample ID: 17855-MW55
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980003
Lab Project ID: 1224980

Collection Date: 08/15/22 17:25
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW55

Client Sample ID: **17855-MW55**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980003
 Lab Project ID: 1224980

Collection Date: 08/15/22 17:25
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
Chloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		08/24/22 16:06
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 16:06
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
Dichlorodifluoromethane	20.1	1.00	0.310	ug/L	1		08/24/22 16:06
Ethylbenzene	1.37	1.00	0.310	ug/L	1		08/24/22 16:06
Freon-113	10.0 U	10.0	3.10	ug/L	1		08/24/22 16:06
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
Isopropylbenzene (Cumene)	1.46	1.00	0.310	ug/L	1		08/24/22 16:06
Methylene chloride	10.0 U	10.0	3.10	ug/L	1		08/24/22 16:06
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		08/24/22 16:06
Naphthalene	34.6	1.00	0.310	ug/L	1		08/24/22 16:06
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
P & M -Xylene	3.31	2.00	0.620	ug/L	1		08/24/22 16:06
sec-Butylbenzene	1.04	1.00	0.310	ug/L	1		08/24/22 16:06
Styrene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
Toluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 16:06
Trichlorofluoromethane	67.8	1.00	0.310	ug/L	1		08/24/22 16:06
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		08/24/22 16:06
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		08/24/22 16:06
Xylenes (total)	4.04	3.00	1.00	ug/L	1		08/24/22 16:06
Surrogates							
1,2-Dichloroethane-D4 (surr)	137	*	81-118	%	1		08/24/22 16:06
4-Bromofluorobenzene (surr)	91.7		85-114	%	1		08/24/22 16:06
Toluene-d8 (surr)	96.3		89-112	%	1		08/24/22 16:06

Print Date: 09/21/2022 1:57:54PM

Results of 17855-MW55

Client Sample ID: **17855-MW55**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980003
Lab Project ID: 1224980

Collection Date: 08/15/22 17:25
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS21905
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 16:06
Container ID: 1224980003-D

Prep Batch: VXX39066
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW8**

Client Sample ID: **17855-MW8**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980004
Lab Project ID: 1224980

Collection Date: 08/16/22 08:25
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.625 U	0.625	0.208	mg/L	1		08/28/22 16:09
Surrogates							
5a Androstane (surr)	74.9	50-150		%	1		08/28/22 16:09

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 16:09
Container ID: 1224980004-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.521 U	0.521	0.208	mg/L	1		08/28/22 16:09
Surrogates							
n-Triacontane-d62 (surr)	86.8	50-150		%	1		08/28/22 16:09

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 16:09
Container ID: 1224980004-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW8**

Client Sample ID: **17855-MW8**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980004
Lab Project ID: 1224980

Collection Date: 08/16/22 08:25
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/22/22 23:06
Surrogates							
4-Bromofluorobenzene (surr)	79.7	50-150		%	1		08/22/22 23:06

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/22/22 23:06
Container ID: 1224980004-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW8

Client Sample ID: 17855-MW8
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980004
Lab Project ID: 1224980

Collection Date: 08/16/22 08:25
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW8

Client Sample ID: **17855-MW8**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980004
 Lab Project ID: 1224980

Collection Date: 08/16/22 08:25
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	9.50	1.00	0.310	ug/L	1		08/24/22 14:48
Chloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		08/24/22 14:48
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 14:48
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Dichlorodifluoromethane	3.82	1.00	0.310	ug/L	1		08/24/22 14:48
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Freon-113	10.0 U	10.0	3.10	ug/L	1		08/24/22 14:48
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Isopropylbenzene (Cumene)	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Methylene chloride	10.0 U	10.0	3.10	ug/L	1		08/24/22 14:48
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		08/24/22 14:48
Naphthalene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/24/22 14:48
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Styrene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Toluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 14:48
Trichlorofluoromethane	18.1	1.00	0.310	ug/L	1		08/24/22 14:48
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		08/24/22 14:48
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		08/24/22 14:48
Xylenes (total)	3.00 U	3.00	1.00	ug/L	1		08/24/22 14:48
Surrogates							
1,2-Dichloroethane-D4 (surr)	107	81-118		%	1		08/24/22 14:48
4-Bromofluorobenzene (surr)	97.7	85-114		%	1		08/24/22 14:48
Toluene-d8 (surr)	104	89-112		%	1		08/24/22 14:48

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW8**

Client Sample ID: **17855-MW8**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980004
Lab Project ID: 1224980

Collection Date: 08/16/22 08:25
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21907
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 14:48
Container ID: 1224980004-D

Prep Batch: VXX39068
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW4**

Client Sample ID: **17855-MW4**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980005
Lab Project ID: 1224980

Collection Date: 08/16/22 09:12
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	1.70	0.625	0.208	mg/L	1		08/28/22 16:19
Surrogates							
5a Androstane (surr)	86.7	50-150		%	1		08/28/22 16:19

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 16:19
Container ID: 1224980005-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.875	0.521	0.208	mg/L	1		08/28/22 16:19
Surrogates							
n-Triacontane-d62 (surr)	97.7	50-150		%	1		08/28/22 16:19

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 16:19
Container ID: 1224980005-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW4

Client Sample ID: **17855-MW4**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980005
Lab Project ID: 1224980

Collection Date: 08/16/22 09:12
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/22/22 23:24
Surrogates							
4-Bromofluorobenzene (surr)	61.6	50-150		%	1		08/22/22 23:24

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/22/22 23:24
Container ID: 1224980005-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW4

Client Sample ID: **17855-MW4**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980005
 Lab Project ID: 1224980

Collection Date: 08/16/22 09:12
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:03
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:03
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		08/24/22 15:03
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		08/24/22 15:03
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,2-Dichloroethane	0.500 U	0.500	0.200	ug/L	1		08/24/22 15:03
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:03
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:03
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
Benzene	0.400 U	0.400	0.120	ug/L	1		08/24/22 15:03
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:03
Bromoform	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Bromomethane	6.00 U	6.00	3.00	ug/L	1		08/24/22 15:03
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:03
Chloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW4

Client Sample ID: **17855-MW4**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980005
 Lab Project ID: 1224980

Collection Date: 08/16/22 09:12
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Chloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:03
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:03
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Dichlorodifluoromethane	2.47	1.00	0.310	ug/L	1		08/24/22 15:03
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Freon-113	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Isopropylbenzene (Cumene)	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Methylene chloride	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
Naphthalene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/24/22 15:03
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Styrene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Toluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:03
Trichlorofluoromethane	10.7	1.00	0.310	ug/L	1		08/24/22 15:03
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:03
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		08/24/22 15:03
Xylenes (total)	3.00 U	3.00	1.00	ug/L	1		08/24/22 15:03
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		08/24/22 15:03
4-Bromofluorobenzene (surr)	97.3	85-114		%	1		08/24/22 15:03
Toluene-d8 (surr)	103	89-112		%	1		08/24/22 15:03

Print Date: 09/21/2022 1:57:54PM

Results of 17855-MW4

Client Sample ID: **17855-MW4**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980005
Lab Project ID: 1224980

Collection Date: 08/16/22 09:12
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS21907
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 15:03
Container ID: 1224980005-D

Prep Batch: VXX39068
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW3

Client Sample ID: 17855-MW3
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980006
Lab Project ID: 1224980

Collection Date: 08/16/22 09:50
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 16:29
Container ID: 1224980006-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62 (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 16:29
Container ID: 1224980006-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW3**

Client Sample ID: **17855-MW3**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980006
Lab Project ID: 1224980

Collection Date: 08/16/22 09:50
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/22/22 23:42
Surrogates							
4-Bromofluorobenzene (surr)	66.2	50-150		%	1		08/22/22 23:42

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/22/22 23:42
Container ID: 1224980006-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW3

Client Sample ID: **17855-MW3**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980006
 Lab Project ID: 1224980

Collection Date: 08/16/22 09:50
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:17
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:17
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		08/24/22 15:17
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:17
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		08/24/22 15:17
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,2-Dichloroethane	0.500 U	0.500	0.200	ug/L	1		08/24/22 15:17
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:17
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:17
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:17
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:17
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:17
Benzene	0.400 U	0.400	0.120	ug/L	1		08/24/22 15:17
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:17
Bromoform	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
Bromomethane	6.00 U	6.00	3.00	ug/L	1		08/24/22 15:17
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		08/24/22 15:17
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 15:17
Chloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 15:17

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW3

Client Sample ID: 17855-MW3
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980006
Lab Project ID: 1224980

Collection Date: 08/16/22 09:50
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical parameters like Chloroform, Benzene, and Toluene with their respective results and limits.

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW3**

Client Sample ID: **17855-MW3**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980006
Lab Project ID: 1224980

Collection Date: 08/16/22 09:50
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21907
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 15:17
Container ID: 1224980006-D

Prep Batch: VXX39068
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW9

Client Sample ID: 17855-MW9
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980007
Lab Project ID: 1224980

Collection Date: 08/16/22 10:40
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 16:39
Container ID: 1224980007-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62 (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 16:39
Container ID: 1224980007-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW9

Client Sample ID: **17855-MW9**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980007
Lab Project ID: 1224980

Collection Date: 08/16/22 10:40
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.228		0.100	0.0450	mg/L	1		08/23/22 01:13
Surrogates								
4-Bromofluorobenzene (surr)	137		50-150		%	1		08/23/22 01:13

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/23/22 01:13
Container ID: 1224980007-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW9

Client Sample ID: 17855-MW9
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980007
Lab Project ID: 1224980

Collection Date: 08/16/22 10:40
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW9

Client Sample ID: 17855-MW9
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980007
Lab Project ID: 1224980

Collection Date: 08/16/22 10:40
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical parameters like Chloroform, Benzene, and Toluene with their respective results and limits.

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW9**

Client Sample ID: **17855-MW9**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980007
Lab Project ID: 1224980

Collection Date: 08/16/22 10:40
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21907
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 15:32
Container ID: 1224980007-D

Prep Batch: VXX39068
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW7**

Client Sample ID: **17855-MW7**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980008
Lab Project ID: 1224980

Collection Date: 08/16/22 11:37
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	1.56	0.638	0.213	mg/L	1		08/28/22 17:09
Surrogates							
5a Androstane (surr)	75.6	50-150		%	1		08/28/22 17:09

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 17:09
Container ID: 1224980008-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.688	0.532	0.213	mg/L	1		08/28/22 17:09
Surrogates							
n-Triacontane-d62 (surr)	85.4	50-150		%	1		08/28/22 17:09

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 17:09
Container ID: 1224980008-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW7**

Client Sample ID: **17855-MW7**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980008
Lab Project ID: 1224980

Collection Date: 08/16/22 11:37
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/23/22 00:00
Surrogates							
4-Bromofluorobenzene (surr)	68.2	50-150		%	1		08/23/22 00:00

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/23/22 00:00
Container ID: 1224980008-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW7

Client Sample ID: 17855-MW7
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980008
Lab Project ID: 1224980

Collection Date: 08/16/22 11:37
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW7

Client Sample ID: 17855-MW7
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980008
Lab Project ID: 1224980

Collection Date: 08/16/22 11:37
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical parameters like Chloroform, Benzene, and Xylenes with their respective results and limits.

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW7**

Client Sample ID: **17855-MW7**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980008
Lab Project ID: 1224980

Collection Date: 08/16/22 11:37
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21907
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 15:47
Container ID: 1224980008-D

Prep Batch: VXX39068
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW10

Client Sample ID: 17855-MW10
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980009
Lab Project ID: 1224980

Collection Date: 08/16/22 13:35
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their detection results.

Batch Information

Analytical Batch: XMS13319
Analytical Method: 8270D SIM LV (PAH)
Analyst: NGG
Analytical Date/Time: 08/26/22 17:24
Container ID: 1224980009-J

Prep Batch: XXX46842
Prep Method: SW3535A
Prep Date/Time: 08/22/22 10:27
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL



Results of **17855-MW10**

Client Sample ID: **17855-MW10**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980009
Lab Project ID: 1224980

Collection Date: 08/16/22 13:35
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	7.39	0.638	0.213	mg/L	1		08/28/22 17:19
Surrogates							
5a Androstane (surr)	85.5	50-150		%	1		08/28/22 17:19

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 17:19
Container ID: 1224980009-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	2.25	0.532	0.213	mg/L	1		08/28/22 17:19
Surrogates							
n-Triacontane-d62 (surr)	95.5	50-150		%	1		08/28/22 17:19

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 17:19
Container ID: 1224980009-G

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW10**

Client Sample ID: **17855-MW10**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980009
Lab Project ID: 1224980

Collection Date: 08/16/22 13:35
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/22/22 20:22
Surrogates							
4-Bromofluorobenzene (surr)	81.2	50-150		%	1		08/22/22 20:22

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/22/22 20:22
Container ID: 1224980009-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW10

Client Sample ID: 17855-MW10
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980009
Lab Project ID: 1224980

Collection Date: 08/16/22 13:35
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW10

Client Sample ID: **17855-MW10**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980009
 Lab Project ID: 1224980

Collection Date: 08/16/22 13:35
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroform	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Chloromethane	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		08/25/22 18:07
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		08/25/22 18:07
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Dichlorodifluoromethane	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Ethylbenzene	4.95	1.00	0.310	ug/L	1		08/25/22 18:07
Freon-113	10.0 U	10.0	3.10	ug/L	1		08/25/22 18:07
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Isopropylbenzene (Cumene)	1.16	1.00	0.310	ug/L	1		08/25/22 18:07
Methylene chloride	10.0 U	10.0	3.10	ug/L	1		08/25/22 18:07
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		08/25/22 18:07
Naphthalene	15.6	1.00	0.310	ug/L	1		08/25/22 18:07
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
n-Propylbenzene	1.00	1.00	0.310	ug/L	1		08/25/22 18:07
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
P & M -Xylene	6.01	2.00	0.620	ug/L	1		08/25/22 18:07
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Styrene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Toluene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Trichlorofluoromethane	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:07
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		08/25/22 18:07
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		08/25/22 18:07
Xylenes (total)	6.01	3.00	1.00	ug/L	1		08/25/22 18:07
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		08/25/22 18:07
4-Bromofluorobenzene (surr)	97.5	85-114		%	1		08/25/22 18:07
Toluene-d8 (surr)	104	89-112		%	1		08/25/22 18:07

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW10**

Client Sample ID: **17855-MW10**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980009
Lab Project ID: 1224980

Collection Date: 08/16/22 13:35
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21906
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/25/22 18:07
Container ID: 1224980009-D

Prep Batch: VXX39067
Prep Method: SW5030B
Prep Date/Time: 08/25/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980010
 Lab Project ID: 1224980

Collection Date: 08/15/22 15:00
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/22/22 17:01
Surrogates							
4-Bromofluorobenzene (surr)	69.2	50-150		%	1		08/22/22 17:01

Batch Information

Analytical Batch: VFC16226
 Analytical Method: AK101
 Analyst: PHK
 Analytical Date/Time: 08/22/22 17:01
 Container ID: 1224980010-A

Prep Batch: VXX39050
 Prep Method: SW5030B
 Prep Date/Time: 08/22/22 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980010
 Lab Project ID: 1224980

Collection Date: 08/15/22 15:00
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 13:37
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 13:37
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		08/24/22 13:37
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		08/24/22 13:37
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,2-Dichloroethane	0.500 U	0.500	0.200	ug/L	1		08/24/22 13:37
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		08/24/22 13:37
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 13:37
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
Benzene	0.400 U	0.400	0.120	ug/L	1		08/24/22 13:37
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 13:37
Bromoform	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Bromomethane	6.00 U	6.00	3.00	ug/L	1		08/24/22 13:37
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/24/22 13:37
Chloroethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37

Print Date: 09/21/2022 1:57:54PM



Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980010
 Lab Project ID: 1224980

Collection Date: 08/15/22 15:00
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Chloromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		08/24/22 13:37
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		08/24/22 13:37
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Dichlorodifluoromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Freon-113	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Isopropylbenzene (Cumene)	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Methylene chloride	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
Naphthalene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/24/22 13:37
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Styrene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Toluene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Trichlorofluoromethane	1.00 U	1.00	0.310	ug/L	1		08/24/22 13:37
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		08/24/22 13:37
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		08/24/22 13:37
Xylenes (total)	3.00 U	3.00	1.00	ug/L	1		08/24/22 13:37
Surrogates							
1,2-Dichloroethane-D4 (surr)	127	*	81-118	%	1		08/24/22 13:37
4-Bromofluorobenzene (surr)	92.9		85-114	%	1		08/24/22 13:37
Toluene-d8 (surr)	96.8		89-112	%	1		08/24/22 13:37

Print Date: 09/21/2022 1:57:54PM



Results of Trip Blank

Client Sample ID: **Trip Blank**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980010
Lab Project ID: 1224980

Collection Date: 08/15/22 15:00
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS21905
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/24/22 13:37
Container ID: 1224980010-D

Prep Batch: VXX39066
Prep Method: SW5030B
Prep Date/Time: 08/24/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW101

Client Sample ID: 17855-MW101
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980011
Lab Project ID: 1224980

Collection Date: 08/16/22 13:45
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their detection results.

Batch Information

Analytical Batch: XMS13319
Analytical Method: 8270D SIM LV (PAH)
Analyst: NGG
Analytical Date/Time: 08/26/22 17:45
Container ID: 1224980011-I

Prep Batch: XXX46842
Prep Method: SW3535A
Prep Date/Time: 08/22/22 10:27
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL



Results of 17855-MW101

Client Sample ID: 17855-MW101
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980011
Lab Project ID: 1224980

Collection Date: 08/16/22 13:45
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/28/22 17:29
Container ID: 1224980011-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62 (surr)).

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/28/22 17:29
Container ID: 1224980011-G
Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 08/25/22 15:50
Prep Initial Wt./Vol.: 235 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW101

Client Sample ID: **17855-MW101**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980011
Lab Project ID: 1224980

Collection Date: 08/16/22 13:45
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.100 U	0.100	0.0450	mg/L	1		08/22/22 20:40
Surrogates							
4-Bromofluorobenzene (surr)	81.7	50-150		%	1		08/22/22 20:40

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 08/22/22 20:40
Container ID: 1224980011-A

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 08/22/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW101

Client Sample ID: 17855-MW101
Client Project ID: 17855 Kotzebue Monitoring Well
Lab Sample ID: 1224980011
Lab Project ID: 1224980

Collection Date: 08/16/22 13:45
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.

Print Date: 09/21/2022 1:57:54PM



Results of 17855-MW101

Client Sample ID: **17855-MW101**
 Client Project ID: **17855 Kotzebue Monitoring Well**
 Lab Sample ID: 1224980011
 Lab Project ID: 1224980

Collection Date: 08/16/22 13:45
 Received Date: 08/19/22 13:14
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroform	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Chloromethane	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		08/25/22 18:22
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		08/25/22 18:22
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Dichlorodifluoromethane	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Ethylbenzene	4.90	1.00	0.310	ug/L	1		08/25/22 18:22
Freon-113	10.0 U	10.0	3.10	ug/L	1		08/25/22 18:22
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Isopropylbenzene (Cumene)	1.22	1.00	0.310	ug/L	1		08/25/22 18:22
Methylene chloride	10.0 U	10.0	3.10	ug/L	1		08/25/22 18:22
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		08/25/22 18:22
Naphthalene	16.7	1.00	0.310	ug/L	1		08/25/22 18:22
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
n-Propylbenzene	1.08	1.00	0.310	ug/L	1		08/25/22 18:22
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
P & M -Xylene	5.97	2.00	0.620	ug/L	1		08/25/22 18:22
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Styrene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Toluene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Trichlorofluoromethane	1.00 U	1.00	0.310	ug/L	1		08/25/22 18:22
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		08/25/22 18:22
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		08/25/22 18:22
Xylenes (total)	5.97	3.00	1.00	ug/L	1		08/25/22 18:22
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		08/25/22 18:22
4-Bromofluorobenzene (surr)	99.7	85-114		%	1		08/25/22 18:22
Toluene-d8 (surr)	103	89-112		%	1		08/25/22 18:22

Print Date: 09/21/2022 1:57:54PM



Results of **17855-MW101**

Client Sample ID: **17855-MW101**
Client Project ID: **17855 Kotzebue Monitoring Well**
Lab Sample ID: 1224980011
Lab Project ID: 1224980

Collection Date: 08/16/22 13:45
Received Date: 08/19/22 13:14
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21906
Analytical Method: SW8260D
Analyst: AZL
Analytical Date/Time: 08/25/22 18:22
Container ID: 1224980011-D

Prep Batch: VXX39067
Prep Method: SW5030B
Prep Date/Time: 08/25/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:54PM



Method Blank

Blank ID: MB for HBN 1841958 [VXX/39050]
Blank Lab ID: 1680966

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1224980001, 1224980002, 1224980004, 1224980005, 1224980006, 1224980007, 1224980008, 1224980009, 1224980010, 1224980011

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	89	50-150		%

Batch Information

Analytical Batch: VFC16226
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 8/22/2022 11:45:00AM

Prep Batch: VXX39050
Prep Method: SW5030B
Prep Date/Time: 8/22/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:57:57PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39050]
 Blank Spike Lab ID: 1680969
 Date Analyzed: 08/22/2022 12:40

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39050]
 Spike Duplicate Lab ID: 1680970
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980001, 1224980002, 1224980004, 1224980005, 1224980006, 1224980007, 1224980008, 1224980009, 1224980010, 1224980011

Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	0.906	91	1.00	0.845	85	(60-120)	7.00	(< 20)

Surrogates

4-Bromofluorobenzene (surr)	0.0500		85	0.0500		81	(50-150)	4.90	
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Batch Information

Analytical Batch: **VFC16226**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890 PID/FID**
 Analyst: **PHK**

Prep Batch: **VXX39050**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/22/2022 06:00**
 Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:00PM



Method Blank

Blank ID: MB for HBN 1842023 [VXX/39054]
Blank Lab ID: 1681262

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224980003

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	76	50-150		%

Batch Information

Analytical Batch: VFC16228
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: PHK
Analytical Date/Time: 8/23/2022 11:57:00AM

Prep Batch: VXX39054
Prep Method: SW5030B
Prep Date/Time: 8/23/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:02PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39054]
 Blank Spike Lab ID: 1681265
 Date Analyzed: 08/23/2022 12:51

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39054]
 Spike Duplicate Lab ID: 1681266
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980003

Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	0.863	86	1.00	0.848	85	(60-120)	1.80	(< 20)

Surrogates

4-Bromofluorobenzene (surr)	0.0500		82	0.0500		75	(50-150)	7.80	
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Batch Information

Analytical Batch: **VFC16228**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890 PID/FID**
 Analyst: **PHK**

Prep Batch: **VXX39054**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/23/2022 06:00**
 Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:05PM

Method Blank

Blank ID: MB for HBN 1842148 [VXX/39066]

Blank Lab ID: 1681858

QC for Samples:

1224980001, 1224980002, 1224980003, 1224980010

Matrix: Water (Surface, Eff., Ground)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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	0.200	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	3.00U	6.00	3.00	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

Print Date: 09/21/2022 1:58:07PM

Method Blank

Blank ID: MB for HBN 1842148 [VXX/39066]
 Blank Lab ID: 1681858

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1224980001, 1224980002, 1224980003, 1224980010

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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)	123*	81-118		%
4-Bromofluorobenzene (surr)	95.5	85-114		%
Toluene-d8 (surr)	97.2	89-112		%



Method Blank

Blank ID: MB for HBN 1842148 [VXX/39066]
Blank Lab ID: 1681858

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224980001, 1224980002, 1224980003, 1224980010

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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Batch Information

Analytical Batch: VMS21905
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: AZL
Analytical Date/Time: 8/24/2022 9:57:00AM

Prep Batch: VXX39066
Prep Method: SW5030B
Prep Date/Time: 8/24/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:07PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39066]
 Blank Spike Lab ID: 1681859
 Date Analyzed: 08/24/2022 10:12

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39066]
 Spike Duplicate Lab ID: 1681860
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980001, 1224980002, 1224980003, 1224980010

Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	30	32.0	107	30	31.6	105	(78-124)	1.30	(< 20)
1,1,1-Trichloroethane	30	33.8	113	30	34.5	115	(74-131)	2.20	(< 20)
1,1,2,2-Tetrachloroethane	30	26.8	89	30	26.8	89	(71-121)	0.19	(< 20)
1,1,2-Trichloroethane	30	29.5	98	30	28.9	96	(80-119)	2.00	(< 20)
1,1-Dichloroethane	30	29.0	97	30	29.6	99	(77-125)	2.30	(< 20)
1,1-Dichloroethene	30	30.8	103	30	31.5	105	(71-131)	2.00	(< 20)
1,1-Dichloropropene	30	30.8	103	30	31.1	104	(79-125)	0.90	(< 20)
1,2,3-Trichlorobenzene	30	29.2	97	30	29.2	97	(69-129)	0.03	(< 20)
1,2,3-Trichloropropane	30	29.3	98	30	29.4	98	(73-122)	0.41	(< 20)
1,2,4-Trichlorobenzene	30	27.9	93	30	28.6	95	(69-130)	2.30	(< 20)
1,2,4-Trimethylbenzene	30	26.0	87	30	26.6	89	(79-124)	2.30	(< 20)
1,2-Dibromo-3-chloropropane	30	29.2	97	30	28.5	95	(62-128)	2.50	(< 20)
1,2-Dibromoethane	30	31.5	105	30	31.0	103	(77-121)	1.60	(< 20)
1,2-Dichlorobenzene	30	28.8	96	30	29.5	98	(80-119)	2.60	(< 20)
1,2-Dichloroethane	30	33.3	111	30	34.0	113	(73-128)	2.20	(< 20)
1,2-Dichloropropane	30	27.9	93	30	28.4	95	(78-122)	1.70	(< 20)
1,3,5-Trimethylbenzene	30	25.7	86	30	26.2	87	(75-124)	2.10	(< 20)
1,3-Dichlorobenzene	30	28.7	96	30	29.6	99	(80-119)	2.80	(< 20)
1,3-Dichloropropane	30	29.2	97	30	28.7	96	(80-119)	1.90	(< 20)
1,4-Dichlorobenzene	30	28.8	96	30	29.5	98	(79-118)	2.60	(< 20)
2,2-Dichloropropane	30	35.4	118	30	35.8	119	(60-139)	1.20	(< 20)
2-Butanone (MEK)	90	86.0	96	90	82.8	92	(56-143)	3.80	(< 20)
2-Chlorotoluene	30	28.5	95	30	27.2	91	(79-122)	4.90	(< 20)
2-Hexanone	90	85.0	94	90	82.4	92	(57-139)	3.10	(< 20)
4-Chlorotoluene	30	27.2	91	30	27.7	92	(78-122)	1.80	(< 20)
4-Isopropyltoluene	30	25.8	86	30	26.4	88	(77-127)	2.30	(< 20)
4-Methyl-2-pentanone (MIBK)	90	88.7	99	90	87.9	98	(67-130)	0.86	(< 20)
Benzene	30	28.7	96	30	29.6	99	(79-120)	3.20	(< 20)
Bromobenzene	30	28.9	96	30	29.7	99	(80-120)	2.70	(< 20)
Bromochloromethane	30	31.3	104	30	32.2	107	(78-123)	3.00	(< 20)
Bromodichloromethane	30	31.2	104	30	32.0	107	(79-125)	2.60	(< 20)
Bromoform	30	32.8	109	30	32.3	108	(66-130)	1.50	(< 20)
Bromomethane	30	26.0	87	30	31.4	105	(53-141)	18.80	(< 20)
Carbon disulfide	45	43.3	96	45	43.9	98	(64-133)	1.40	(< 20)

Print Date: 09/21/2022 1:58:10PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39066]
 Blank Spike Lab ID: 1681859
 Date Analyzed: 08/24/2022 10:12

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39066]
 Spike Duplicate Lab ID: 1681860
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980001, 1224980002, 1224980003, 1224980010

Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Carbon tetrachloride	30	34.0	113	30	34.7	116	(72-136)	2.00	(< 20)
Chlorobenzene	30	30.2	101	30	30.3	101	(82-118)	0.56	(< 20)
Chloroethane	30	29.1	97	30	30.1	100	(60-138)	3.30	(< 20)
Chloroform	30	29.4	98	30	30.2	101	(79-124)	2.60	(< 20)
Chloromethane	30	24.1	80	30	24.4	81	(50-139)	1.20	(< 20)
cis-1,2-Dichloroethene	30	29.2	97	30	30.3	101	(78-123)	3.70	(< 20)
cis-1,3-Dichloropropene	30	30.8	103	30	31.4	105	(75-124)	2.00	(< 20)
Dibromochloromethane	30	32.3	108	30	31.9	106	(74-126)	1.20	(< 20)
Dibromomethane	30	31.9	106	30	32.5	108	(79-123)	1.60	(< 20)
Dichlorodifluoromethane	30	31.7	106	30	31.9	106	(32-152)	0.50	(< 20)
Ethylbenzene	30	30.6	102	30	30.6	102	(79-121)	0.13	(< 20)
Freon-113	45	48.5	108	45	49.2	109	(70-136)	1.40	(< 20)
Hexachlorobutadiene	30	30.0	100	30	30.6	102	(66-134)	1.90	(< 20)
Isopropylbenzene (Cumene)	30	31.3	104	30	31.2	104	(72-131)	0.26	(< 20)
Methylene chloride	30	30.1	100	30	30.7	102	(74-124)	2.10	(< 20)
Methyl-t-butyl ether	45	50.8	113	45	50.8	113	(71-124)	0.16	(< 20)
Naphthalene	30	29.0	97	30	30.0	100	(61-128)	3.60	(< 20)
n-Butylbenzene	30	25.2	84	30	25.8	86	(75-128)	2.10	(< 20)
n-Propylbenzene	30	28.5	95	30	29.2	97	(76-126)	2.40	(< 20)
o-Xylene	30	30.9	103	30	30.9	103	(78-122)	0.07	(< 20)
P & M -Xylene	60	63.1	105	60	62.8	105	(80-121)	0.54	(< 20)
sec-Butylbenzene	30	28.4	95	30	29.0	97	(77-126)	2.20	(< 20)
Styrene	30	28.8	96	30	28.7	96	(78-123)	0.17	(< 20)
tert-Butylbenzene	30	28.6	95	30	29.4	98	(78-124)	2.60	(< 20)
Tetrachloroethene	30	31.8	106	30	31.3	104	(74-129)	1.70	(< 20)
Toluene	30	27.4	92	30	27.2	91	(80-121)	0.80	(< 20)
trans-1,2-Dichloroethene	30	30.1	100	30	30.7	102	(75-124)	2.00	(< 20)
trans-1,3-Dichloropropene	30	30.8	103	30	30.6	102	(73-127)	0.88	(< 20)
Trichloroethene	30	30.7	102	30	31.1	104	(79-123)	1.10	(< 20)
Trichlorofluoromethane	30	33.8	113	30	34.6	115	(65-141)	2.10	(< 20)
Vinyl acetate	30	33.2	111	30	32.6	109	(54-146)	1.60	(< 20)
Vinyl chloride	30	27.9	93	30	28.0	93	(58-137)	0.36	(< 20)
Xylenes (total)	90	94.0	104	90	93.7	104	(79-121)	0.34	(< 20)

Print Date: 09/21/2022 1:58:10PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39066]
 Blank Spike Lab ID: 1681859
 Date Analyzed: 08/24/2022 10:12

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39066]
 Spike Duplicate Lab ID: 1681860
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980001, 1224980002, 1224980003, 1224980010

Results by SW8260D

Parameter	Blank Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		117	30		117	(81-118)	0.06	
4-Bromofluorobenzene (surr)	30		92	30		93	(85-114)	1.90	
Toluene-d8 (surr)	30		98	30		97	(89-112)	1.10	

Batch Information

Analytical Batch: **VMS21905**
 Analytical Method: **SW8260D**
 Instrument: **Agilent 7890-75MS**
 Analyst: **AZL**

Prep Batch: **VXX39066**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/24/2022 06:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:10PM

Method Blank

Blank ID: MB for HBN 1842151 [VXX/39067]

Blank Lab ID: 1681868

QC for Samples:

1224980009, 1224980011

Matrix: Water (Surface, Eff., Ground)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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	0.200	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	3.00U	6.00	3.00	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

Print Date: 09/21/2022 1:58:12PM

Method Blank

Blank ID: MB for HBN 1842151 [VXX/39067]

Blank Lab ID: 1681868

QC for Samples:

1224980009, 1224980011

Matrix: Water (Surface, Eff., Ground)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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)	108	81-118		%
4-Bromofluorobenzene (surr)	98.5	85-114		%
Toluene-d8 (surr)	102	89-112		%



Method Blank

Blank ID: MB for HBN 1842151 [VXX/39067]
Blank Lab ID: 1681868

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224980009, 1224980011

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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Batch Information

Analytical Batch: VMS21906
Analytical Method: SW8260D
Instrument: VPA 780/5975 GC/MS
Analyst: AZL
Analytical Date/Time: 8/25/2022 12:26:00PM

Prep Batch: VXX39067
Prep Method: SW5030B
Prep Date/Time: 8/25/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:12PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39067]
 Blank Spike Lab ID: 1681869
 Date Analyzed: 08/25/2022 12:40

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39067]
 Spike Duplicate Lab ID: 1681870
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980009, 1224980011

Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	30	33.2	111	30	33.1	110	(78-124)	0.42	(< 20)
1,1,1-Trichloroethane	30	30.0	100	30	30.7	102	(74-131)	2.40	(< 20)
1,1,2,2-Tetrachloroethane	30	30.7	102	30	30.2	101	(71-121)	1.60	(< 20)
1,1,2-Trichloroethane	30	31.7	106	30	31.0	103	(80-119)	2.00	(< 20)
1,1-Dichloroethane	30	28.2	94	30	28.5	95	(77-125)	0.88	(< 20)
1,1-Dichloroethene	30	27.6	92	30	28.2	94	(71-131)	2.10	(< 20)
1,1-Dichloropropene	30	29.2	97	30	30.1	100	(79-125)	2.90	(< 20)
1,2,3-Trichlorobenzene	30	31.3	104	30	31.7	106	(69-129)	1.40	(< 20)
1,2,3-Trichloropropane	30	31.4	105	30	30.8	103	(73-122)	1.90	(< 20)
1,2,4-Trichlorobenzene	30	30.9	103	30	31.4	105	(69-130)	1.40	(< 20)
1,2,4-Trimethylbenzene	30	30.7	102	30	31.5	105	(79-124)	2.50	(< 20)
1,2-Dibromo-3-chloropropane	30	30.7	102	30	30.5	102	(62-128)	0.75	(< 20)
1,2-Dibromoethane	30	32.4	108	30	31.9	106	(77-121)	1.40	(< 20)
1,2-Dichlorobenzene	30	31.2	104	30	31.3	104	(80-119)	0.16	(< 20)
1,2-Dichloroethane	30	28.8	96	30	28.4	95	(73-128)	1.20	(< 20)
1,2-Dichloropropane	30	30.2	101	30	30.2	101	(78-122)	0.13	(< 20)
1,3,5-Trimethylbenzene	30	30.6	102	30	31.1	104	(75-124)	1.80	(< 20)
1,3-Dichlorobenzene	30	31.2	104	30	32.0	107	(80-119)	2.50	(< 20)
1,3-Dichloropropane	30	31.2	104	30	30.7	102	(80-119)	1.60	(< 20)
1,4-Dichlorobenzene	30	31.8	106	30	31.6	105	(79-118)	0.51	(< 20)
2,2-Dichloropropane	30	27.9	93	30	28.8	96	(60-139)	3.10	(< 20)
2-Butanone (MEK)	90	86.8	96	90	82.5	92	(56-143)	5.10	(< 20)
2-Chlorotoluene	30	30.6	102	30	31.0	103	(79-122)	1.20	(< 20)
2-Hexanone	90	96.4	107	90	93.3	104	(57-139)	3.20	(< 20)
4-Chlorotoluene	30	30.7	102	30	31.0	103	(78-122)	0.84	(< 20)
4-Isopropyltoluene	30	31.4	105	30	32.3	108	(77-127)	2.60	(< 20)
4-Methyl-2-pentanone (MIBK)	90	93.5	104	90	91.3	101	(67-130)	2.30	(< 20)
Benzene	30	29.2	97	30	29.5	98	(79-120)	0.85	(< 20)
Bromobenzene	30	31.3	104	30	31.4	105	(80-120)	0.29	(< 20)
Bromochloromethane	30	30.0	100	30	29.8	100	(78-123)	0.60	(< 20)
Bromodichloromethane	30	31.3	104	30	31.0	103	(79-125)	0.99	(< 20)
Bromoform	30	30.4	101	30	29.8	99	(66-130)	2.10	(< 20)
Bromomethane	30	26.1	87	30	26.1	87	(53-141)	0.04	(< 20)
Carbon disulfide	45	39.0	87	45	39.8	89	(64-133)	2.10	(< 20)

Print Date: 09/21/2022 1:58:14PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39067]
 Blank Spike Lab ID: 1681869
 Date Analyzed: 08/25/2022 12:40

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39067]
 Spike Duplicate Lab ID: 1681870
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980009, 1224980011

Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Carbon tetrachloride	30	30.7	102	30	31.8	106	(72-136)	3.20	(< 20)
Chlorobenzene	30	31.5	105	30	31.7	106	(82-118)	0.54	(< 20)
Chloroethane	30	35.3	118	30	33.5	112	(60-138)	5.30	(< 20)
Chloroform	30	29.2	97	30	29.2	97	(79-124)	0.00	(< 20)
Chloromethane	30	26.2	88	30	26.5	88	(50-139)	1.10	(< 20)
cis-1,2-Dichloroethene	30	29.2	97	30	29.1	97	(78-123)	0.31	(< 20)
cis-1,3-Dichloropropene	30	29.5	98	30	29.4	98	(75-124)	0.61	(< 20)
Dibromochloromethane	30	30.8	103	30	30.3	101	(74-126)	1.60	(< 20)
Dibromomethane	30	30.0	100	30	29.3	98	(79-123)	2.60	(< 20)
Dichlorodifluoromethane	30	26.8	89	30	27.4	91	(32-152)	2.20	(< 20)
Ethylbenzene	30	32.5	108	30	32.6	109	(79-121)	0.58	(< 20)
Freon-113	45	42.7	95	45	43.7	97	(70-136)	2.40	(< 20)
Hexachlorobutadiene	30	30.3	101	30	31.3	104	(66-134)	3.10	(< 20)
Isopropylbenzene (Cumene)	30	32.2	107	30	32.5	108	(72-131)	0.99	(< 20)
Methylene chloride	30	28.9	96	30	28.9	96	(74-124)	0.17	(< 20)
Methyl-t-butyl ether	45	46.2	103	45	45.4	101	(71-124)	1.70	(< 20)
Naphthalene	30	32.5	108	30	32.6	109	(61-128)	0.34	(< 20)
n-Butylbenzene	30	30.9	103	30	31.5	105	(75-128)	2.00	(< 20)
n-Propylbenzene	30	30.5	102	30	31.3	104	(76-126)	2.50	(< 20)
o-Xylene	30	31.6	105	30	31.8	106	(78-122)	0.69	(< 20)
P & M -Xylene	60	63.7	106	60	64.6	108	(80-121)	1.40	(< 20)
sec-Butylbenzene	30	31.0	103	30	31.7	106	(77-126)	2.50	(< 20)
Styrene	30	33.0	110	30	32.8	109	(78-123)	0.40	(< 20)
tert-Butylbenzene	30	30.7	102	30	31.8	106	(78-124)	3.50	(< 20)
Tetrachloroethene	30	30.8	103	30	31.3	104	(74-129)	1.80	(< 20)
Toluene	30	29.6	99	30	30.1	100	(80-121)	1.50	(< 20)
trans-1,2-Dichloroethene	30	28.6	95	30	29.0	97	(75-124)	1.30	(< 20)
trans-1,3-Dichloropropene	30	28.7	96	30	28.0	93	(73-127)	2.50	(< 20)
Trichloroethene	30	30.0	100	30	30.4	101	(79-123)	1.30	(< 20)
Trichlorofluoromethane	30	31.2	104	30	33.0	110	(65-141)	5.60	(< 20)
Vinyl acetate	30	27.1	91	30	26.4	88	(54-146)	2.80	(< 20)
Vinyl chloride	30	26.4	88	30	26.6	89	(58-137)	0.57	(< 20)
Xylenes (total)	90	95.3	106	90	96.4	107	(79-121)	1.20	(< 20)

Print Date: 09/21/2022 1:58:14PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39067]
 Blank Spike Lab ID: 1681869
 Date Analyzed: 08/25/2022 12:40

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39067]
 Spike Duplicate Lab ID: 1681870
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980009, 1224980011

Results by SW8260D

Parameter	Blank Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		105	30		101	(81-118)	3.50	
4-Bromofluorobenzene (surr)	30		97	30		97	(85-114)	0.45	
Toluene-d8 (surr)	30		104	30		104	(89-112)	0.19	

Batch Information

Analytical Batch: **VMS21906**
 Analytical Method: **SW8260D**
 Instrument: **VPA 780/5975 GC/MS**
 Analyst: **AZL**

Prep Batch: **VXX39067**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/25/2022 06:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:14PM

Method Blank

Blank ID: MB for HBN 1842155 [VXX/39068]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1681880

QC for Samples:

1224980004, 1224980005, 1224980006, 1224980007, 1224980008

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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	0.200	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	3.00U	6.00	3.00	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

Print Date: 09/21/2022 1:58:16PM

Method Blank

Blank ID: MB for HBN 1842155 [VXX/39068]
 Blank Lab ID: 1681880

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1224980004, 1224980005, 1224980006, 1224980007, 1224980008

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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)	108	81-118		%
4-Bromofluorobenzene (surr)	96.7	85-114		%
Toluene-d8 (surr)	105	89-112		%



Method Blank

Blank ID: MB for HBN 1842155 [VXX/39068]
Blank Lab ID: 1681880

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224980004, 1224980005, 1224980006, 1224980007, 1224980008

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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Batch Information

Analytical Batch: VMS21907
Analytical Method: SW8260D
Instrument: VPA 780/5975 GC/MS
Analyst: AZL
Analytical Date/Time: 8/24/2022 9:55:00AM

Prep Batch: VXX39068
Prep Method: SW5030B
Prep Date/Time: 8/24/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:16PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39068]
 Blank Spike Lab ID: 1681881
 Date Analyzed: 08/24/2022 10:10

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39068]
 Spike Duplicate Lab ID: 1681882
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980004, 1224980005, 1224980006, 1224980007, 1224980008

Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	30	33.5	112	30	32.8	109	(78-124)	2.20	(< 20)
1,1,1-Trichloroethane	30	31.2	104	30	30.0	100	(74-131)	3.90	(< 20)
1,1,2,2-Tetrachloroethane	30	31.0	103	30	30.8	103	(71-121)	0.52	(< 20)
1,1,2-Trichloroethane	30	32.1	107	30	31.8	106	(80-119)	1.10	(< 20)
1,1-Dichloroethane	30	29.3	98	30	28.3	94	(77-125)	3.30	(< 20)
1,1-Dichloroethene	30	29.6	99	30	27.8	93	(71-131)	6.00	(< 20)
1,1-Dichloropropene	30	30.8	103	30	29.6	99	(79-125)	4.00	(< 20)
1,2,3-Trichlorobenzene	30	32.2	107	30	31.7	106	(69-129)	1.40	(< 20)
1,2,3-Trichloropropane	30	31.6	105	30	31.2	104	(73-122)	1.30	(< 20)
1,2,4-Trichlorobenzene	30	32.0	107	30	31.5	105	(69-130)	1.40	(< 20)
1,2,4-Trimethylbenzene	30	31.9	106	30	30.6	102	(79-124)	4.00	(< 20)
1,2-Dibromo-3-chloropropane	30	31.5	105	30	30.7	102	(62-128)	2.60	(< 20)
1,2-Dibromoethane	30	32.8	109	30	32.6	109	(77-121)	0.89	(< 20)
1,2-Dichlorobenzene	30	31.7	106	30	31.2	104	(80-119)	1.50	(< 20)
1,2-Dichloroethane	30	29.1	97	30	28.7	96	(73-128)	1.40	(< 20)
1,2-Dichloropropane	30	31.0	103	30	30.6	102	(78-122)	1.30	(< 20)
1,3,5-Trimethylbenzene	30	31.6	105	30	31.0	103	(75-124)	1.90	(< 20)
1,3-Dichlorobenzene	30	32.4	108	30	31.9	106	(80-119)	1.50	(< 20)
1,3-Dichloropropane	30	31.6	105	30	31.4	105	(80-119)	0.64	(< 20)
1,4-Dichlorobenzene	30	32.0	107	30	31.7	106	(79-118)	0.88	(< 20)
2,2-Dichloropropane	30	29.3	98	30	28.3	94	(60-139)	3.50	(< 20)
2-Butanone (MEK)	90	88.2	98	90	84.5	94	(56-143)	4.30	(< 20)
2-Chlorotoluene	30	31.6	105	30	30.9	103	(79-122)	2.30	(< 20)
2-Hexanone	90	97.3	108	90	95.8	106	(57-139)	1.60	(< 20)
4-Chlorotoluene	30	31.7	106	30	31.0	103	(78-122)	2.40	(< 20)
4-Isopropyltoluene	30	32.7	109	30	31.2	104	(77-127)	4.90	(< 20)
4-Methyl-2-pentanone (MIBK)	90	94.3	105	90	93.8	104	(67-130)	0.47	(< 20)
Benzene	30	30.1	100	30	29.4	98	(79-120)	2.20	(< 20)
Bromobenzene	30	32.3	108	30	31.7	106	(80-120)	2.00	(< 20)
Bromochloromethane	30	30.4	101	30	30.2	101	(78-123)	0.56	(< 20)
Bromodichloromethane	30	31.8	106	30	31.2	104	(79-125)	1.80	(< 20)
Bromoform	30	30.2	101	30	30.4	101	(66-130)	0.59	(< 20)
Bromomethane	30	28.8	96	30	27.3	91	(53-141)	5.30	(< 20)
Carbon disulfide	45	41.9	93	45	39.5	88	(64-133)	5.90	(< 20)

Print Date: 09/21/2022 1:58:19PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39068]
 Blank Spike Lab ID: 1681881
 Date Analyzed: 08/24/2022 10:10

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39068]
 Spike Duplicate Lab ID: 1681882
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980004, 1224980005, 1224980006, 1224980007, 1224980008

Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Carbon tetrachloride	30	31.9	106	30	30.8	103	(72-136)	3.50	(< 20)
Chlorobenzene	30	32.3	108	30	31.7	106	(82-118)	2.10	(< 20)
Chloroethane	30	35.3	118	30	34.0	113	(60-138)	3.80	(< 20)
Chloroform	30	29.8	99	30	29.2	97	(79-124)	2.00	(< 20)
Chloromethane	30	27.8	93	30	26.4	88	(50-139)	5.00	(< 20)
cis-1,2-Dichloroethene	30	29.4	98	30	29.1	97	(78-123)	0.82	(< 20)
cis-1,3-Dichloropropene	30	30.3	101	30	29.9	100	(75-124)	1.20	(< 20)
Dibromochloromethane	30	31.0	103	30	30.7	102	(74-126)	1.20	(< 20)
Dibromomethane	30	30.3	101	30	29.5	98	(79-123)	2.60	(< 20)
Dichlorodifluoromethane	30	30.1	100	30	28.2	94	(32-152)	6.20	(< 20)
Ethylbenzene	30	33.2	111	30	32.4	108	(79-121)	2.70	(< 20)
Freon-113	45	45.4	101	45	43.1	96	(70-136)	5.30	(< 20)
Hexachlorobutadiene	30	31.6	105	30	30.2	101	(66-134)	4.50	(< 20)
Isopropylbenzene (Cumene)	30	32.9	110	30	32.0	107	(72-131)	2.80	(< 20)
Methylene chloride	30	30.4	101	30	29.7	99	(74-124)	2.20	(< 20)
Methyl-t-butyl ether	45	47.4	105	45	46.9	104	(71-124)	0.95	(< 20)
Naphthalene	30	33.4	111	30	33.3	111	(61-128)	0.42	(< 20)
n-Butylbenzene	30	32.1	107	30	31.0	103	(75-128)	3.60	(< 20)
n-Propylbenzene	30	31.9	106	30	30.9	103	(76-126)	3.20	(< 20)
o-Xylene	30	32.6	109	30	31.5	105	(78-122)	3.20	(< 20)
P & M -Xylene	60	66.1	110	60	63.8	106	(80-121)	3.60	(< 20)
sec-Butylbenzene	30	32.2	107	30	30.8	103	(77-126)	4.40	(< 20)
Styrene	30	33.7	112	30	32.7	109	(78-123)	2.70	(< 20)
tert-Butylbenzene	30	32.2	107	30	31.2	104	(78-124)	3.00	(< 20)
Tetrachloroethene	30	31.6	105	30	30.8	103	(74-129)	2.70	(< 20)
Toluene	30	30.8	103	30	29.9	100	(80-121)	2.80	(< 20)
trans-1,2-Dichloroethene	30	29.6	99	30	28.4	95	(75-124)	4.20	(< 20)
trans-1,3-Dichloropropene	30	29.0	97	30	28.4	95	(73-127)	2.10	(< 20)
Trichloroethene	30	31.1	104	30	30.1	100	(79-123)	3.40	(< 20)
Trichlorofluoromethane	30	33.2	111	30	30.2	101	(65-141)	9.40	(< 20)
Vinyl acetate	30	27.6	92	30	27.1	90	(54-146)	1.90	(< 20)
Vinyl chloride	30	28.0	93	30	26.4	88	(58-137)	5.90	(< 20)
Xylenes (total)	90	98.7	110	90	95.3	106	(79-121)	3.40	(< 20)

Print Date: 09/21/2022 1:58:19PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [VXX39068]
 Blank Spike Lab ID: 1681881
 Date Analyzed: 08/24/2022 10:10

Spike Duplicate ID: LCSD for HBN 1224980 [VXX39068]
 Spike Duplicate Lab ID: 1681882
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980004, 1224980005, 1224980006, 1224980007, 1224980008

Results by SW8260D

Parameter	Blank Spike (%)			Spike Duplicate (%)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		103	30		104	(81-118)	1.20	
4-Bromofluorobenzene (surr)	30		98	30		97	(85-114)	1.10	
Toluene-d8 (surr)	30		104	30		104	(89-112)	0.03	

Batch Information

Analytical Batch: **VMS21907**
 Analytical Method: **SW8260D**
 Instrument: **VPA 780/5975 GC/MS**
 Analyst: **AZL**

Prep Batch: **VXX39068**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/24/2022 06:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 09/21/2022 1:58:19PM

Method Blank

Blank ID: MB for HBN 1841857 [XXX/46842]
 Blank Lab ID: 1680732

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1224980009, 1224980011

Results by 8270D SIM LV (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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	0.0264J	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0173J	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0294J	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0198J	0.0500	0.0150	ug/L
Chrysene	0.0180J	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0236J	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	0.0324J	0.100	0.0310	ug/L
Pyrene	0.0200J	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	62.8	42-86		%
Fluoranthene-d10 (surr)	72.8	50-97		%

Batch Information

Analytical Batch: XMS13319
 Analytical Method: 8270D SIM LV (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: NGG
 Analytical Date/Time: 8/26/2022 10:53:00AM

Prep Batch: XXX46842
 Prep Method: SW3535A
 Prep Date/Time: 8/22/2022 10:27:40AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [XXX46842]
 Blank Spike Lab ID: 1680733
 Date Analyzed: 08/26/2022 11:14

Spike Duplicate ID: LCSD for HBN 1224980
 [XXX46842]
 Spike Duplicate Lab ID: 1680734
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980009, 1224980011

Results by 8270D SIM LV (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	2	1.28	64	2	1.29	64	(41-115)	0.26	(< 20)
2-Methylnaphthalene	2	1.24	62	2	1.24	62	(39-114)	0.56	(< 20)
Acenaphthene	2	1.48	74	2	1.46	73	(48-114)	0.90	(< 20)
Acenaphthylene	2	1.48	74	2	1.47	73	(35-121)	0.86	(< 20)
Anthracene	2	1.62	81	2	1.58	79	(53-119)	3.00	(< 20)
Benzo(a)Anthracene	2	1.49	75	2	1.54	77	(59-120)	3.10	(< 20)
Benzo[a]pyrene	2	1.59	80	2	1.65	83	(53-120)	3.90	(< 20)
Benzo[b]Fluoranthene	2	1.50	75	2	1.59	80	(53-126)	6.20	(< 20)
Benzo[g,h,i]perylene	2	1.79	90	2	1.84	92	(44-128)	2.50	(< 20)
Benzo[k]fluoranthene	2	1.70	85	2	1.75	88	(54-125)	2.80	(< 20)
Chrysene	2	1.60	80	2	1.63	82	(57-120)	1.90	(< 20)
Dibenzo[a,h]anthracene	2	1.77	89	2	1.82	91	(44-131)	2.30	(< 20)
Fluoranthene	2	1.50	75	2	1.50	75	(58-120)	0.32	(< 20)
Fluorene	2	1.53	77	2	1.49	74	(50-118)	2.70	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.76	88	2	1.79	90	(48-130)	2.10	(< 20)
Naphthalene	2	1.25	62	2	1.25	63	(43-114)	0.52	(< 20)
Phenanthrene	2	1.63	81	2	1.62	81	(53-115)	0.41	(< 20)
Pyrene	2	1.53	77	2	1.48	74	(53-121)	3.10	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2		59	2		57	(42-86)	2.60	
Fluoranthene-d10 (surr)	2		69	2		68	(50-97)	1.10	

Batch Information

Analytical Batch: XMS13319
 Analytical Method: 8270D SIM LV (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: NGG

Prep Batch: XXX46842
 Prep Method: SW3535A
 Prep Date/Time: 08/22/2022 10:27
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Print Date: 09/21/2022 1:58:24PM



Method Blank

Blank ID: MB for HBN 1842097 [XXX/46868]
Blank Lab ID: 1681614

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1224980001, 1224980002, 1224980003, 1224980004, 1224980005, 1224980006, 1224980007, 1224980008, 1224980009, 1224980011

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.200	mg/L
Surrogates				
5a Androstane (surr)	76.4	60-120		%

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: HMW
Analytical Date/Time: 8/28/2022 1:25:00PM

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 8/25/2022 3:50:36PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:58:26PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [XXX46868]
 Blank Spike Lab ID: 1681615
 Date Analyzed: 08/28/2022 13:35

Spike Duplicate ID: LCSD for HBN 1224980 [XXX46868]
 Spike Duplicate Lab ID: 1681616
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980001, 1224980002, 1224980003, 1224980004, 1224980005, 1224980006, 1224980007, 1224980008, 1224980009, 1224980011

Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	16.6	83	20	16.2	81	(75-125)	2.10	(< 20)
Surrogates									
5a Androstane (surr)	0.4		84	0.4		84	(60-120)	0.36	

Batch Information

Analytical Batch: **XFC16326**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B R**
 Analyst: **HMW**

Prep Batch: **XXX46868**
 Prep Method: **SW3520C**
 Prep Date/Time: **08/25/2022 15:50**
 Spike Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL

Print Date: 09/21/2022 1:58:29PM



Method Blank

Blank ID: MB for HBN 1842097 [XXX/46868]
Blank Lab ID: 1681614

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1224980001, 1224980002, 1224980003, 1224980004, 1224980005, 1224980006, 1224980007, 1224980008, 1224980009, 1224980011

Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Residual Range Organics	0.250U	0.500	0.200	mg/L
Surrogates				
n-Triacontane-d62 (surr)	94	60-120		%

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: HMW
Analytical Date/Time: 8/28/2022 1:25:00PM

Prep Batch: XXX46868
Prep Method: SW3520C
Prep Date/Time: 8/25/2022 3:50:36PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 09/21/2022 1:58:31PM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224980 [XXX46868]
 Blank Spike Lab ID: 1681615
 Date Analyzed: 08/28/2022 13:35

Spike Duplicate ID: LCSD for HBN 1224980 [XXX46868]
 Spike Duplicate Lab ID: 1681616
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224980001, 1224980002, 1224980003, 1224980004, 1224980005, 1224980006, 1224980007, 1224980008, 1224980009, 1224980011

Results by AK103

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range Organics	20	18.2	91	20	17.6	88	(60-120)	3.70	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4		92	0.4		92	(60-120)	0.42	

Batch Information

Analytical Batch: **XFC16326**
 Analytical Method: **AK103**
 Instrument: **Agilent 7890B R**
 Analyst: **HMW**

Prep Batch: **XXX46868**
 Prep Method: **SW3520C**
 Prep Date/Time: **08/25/2022 15:50**
 Spike Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL

Print Date: 09/21/2022 1:58:33PM



SGS North America Inc. CHAIN OF CUSTODY RECORD

1224980



Profile #369569 JM

CLIENT: EMI

CONTACT: Delaney Dent/Shayla Marshall **PHONE #:** 907-272-9336 / 907-952-7287

PROJECT NAME: Kotzebue Monitoring Wells **PROJECT/PWSID/PERMIT#:** 17855

REPORTS TO: Delaney Dent/Shayla Marshall **E-MAIL:** ddent@emi-alaska.com / Profile #: smmarshall@emi-alaska.com

INVOICE TO: Erin Smith **QUOTE #:** esmith@emi-alaska.com **P.O. #:**

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis. Page 1 of 2

Section 3 Preservative

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE	CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis*										REMARKS/LOC ID		
							HCl	HCl	HCl										
1AH	17855-MW2	8/15/2022	16:30	Water	8	Grab	X	X	X										
2AH	17855-MW5	8/15/2022	17:35	Water	8	Grab	X	X	X										
3AH	17855-MW55	8/15/2022	17:25	Water	8	Grab	X	X	X										
4AH	17855-MW8	8/16/2022	8:25	Water	8	Grab	X	X	X										
5AH	17855-MW4	8/16/2022	9:12	Water	8	Grab	X	X	X										
6AH	17855-MW3	8/16/2022	9:50	Water	8	Grab	X	X	X										
7AH	17855-MW9	8/16/2022	10:40	Water	8	Grab	X	X	X										
8AH	17855-MW7	8/16/2022	11:37	Water	8	Grab	X	X	X										
9AJ	17855-MW10	8/16/2022	13:35	Water	8	Grab	X	X	X	X									
10AF	Trip blank	8/15/2022	15:00				X	X											

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 4 DOD Project? Yes No Data Deliverable Requirements: level II

Section 5

Relinquished By: (1) <i>Delaney Dent</i>	Date: 8/17/22	Time: 16:00	Received By: <i>Erin Smith</i>	Requested Turnaround Time and/or Special Instructions: Standard Turnaround Time
Relinquished By: (2) <i>Erin Smith</i>	Date: 8/19/22	Time: 13:14	Received By: <i>Erin Smith</i>	
Relinquished By: (3)	Date:	Time:	Received By:	
Relinquished By: (4) <i>Erin Smith</i>	Date: 8/19/22	Time: 13:14	Received For Laboratory By: <i>Erin Smith</i>	

Temp Blank °C: 1.8 D62 or Ambient [] Chain of Custody Seal: (Circle) INTACT BROKEN **ABSENT**

Delivery Method: Hand Delivery Commercial Delivery []



SGS North America Inc.
CHAIN OF CUSTODY RECORD

www.us.sgs.com

CLIENT: EMI					Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.					Page <u>2</u> of <u>2</u>											
CONTACT: Delaney Dent/Shayla Marshall PHONE #: 907-272-9336					Section 3	Preservative															
PROJECT NAME: Kotzebue Monitoring Wells PROJECT/PWSID/PERMIT#: 17855					# C O N T A I N E R S	Analysis*					NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS										
REPORTS TO: Delaney Dent/Shayla Marshall E-MAIL: ddent@emi-alaska.com Profile #: smarshall@emi-alaska.com						Comp	GRO-AK101 VOC-SW8260B DRO/RRO-AK 1021103 PAX-SW8270 SIMS														
INVOICE TO: Erin Smith QUOTE #:						Grab															
esmith@emi-alaska.com P.O. #:						MI (Multi-incremental)															
RESERVED for lab use	SAMPLE IDENTIFICATION		DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE	8	Grab	X	X	X	X									REMARKS/LOC ID	
11A5	17855-MW101		8/16/2022	13:45	Water																
Relinquished By: (1) [Signature] Date: 8/16/22 Time: 16:00 Received By: [Signature]					Section 4		DOD Project? Yes <input checked="" type="checkbox"/>			Data Deliverable Requirements: Level II											
Relinquished By: (2) [Signature] Date: 8/19/22 Time: 13:14 Received By: [Signature]					Cooler ID: _____							Requested Turnaround Time and/or Special Instructions: Standard Turnaround Time									
Relinquished By: (3) _____ Date: _____ Time: _____ Received By: _____					Temp Blank °C: 1.8 D62							Chain of Custody Seal: (Circle) INTACT BROKEN <u>ABSENT</u>									
Relinquished By: (4) _____ Date: 9/19/22 Time: 13:14 Received For Laboratory By: [Signature]					or Ambient []							Delivery Method: Hand Delivery <input checked="" type="checkbox"/> / Commercial Delivery []									

<http://www.sgs.com/terms-and-conditions>



SGS Workorder #:

1224980

1224980

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
-----------------	--------------------------	------------------------

Chain of Custody / Temperature Requirements

Note: Temperature and COC seal information is found on the chain of custody form

DOD only: Did all sample coolers have a corresponding COC?	N/A
If <0°C, were sample containers ice free?	N/A
Note containers received with ice:	

Identify any containers received at non-compliant temperature:

(Use form FS-0029 if more space is needed)

Holding Time / Documentation / Sample Condition Requirement

Note: Refer to form F-083 "Sample Guide" for specific holding times and sample containers.

Were samples received within analytical holding time?	Yes
Do sample labels match COC? Record discrepancies.	Yes

Note: If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.

Were analytical requests clear? <i>(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)</i>	Yes
--	-----

Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes
--	-----

Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)

Were all soil VOAs received with a corresponding % solids container?	N/A
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	Yes
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	Yes
Were all soil VOAs field extracted with Methanol+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):



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1224980001-A	HCL to pH < 2	OK	1224980007-B	HCL to pH < 2	OK
1224980001-B	HCL to pH < 2	OK	1224980007-C	HCL to pH < 2	OK
1224980001-C	HCL to pH < 2	OK	1224980007-D	HCL to pH < 2	OK
1224980001-D	HCL to pH < 2	OK	1224980007-E	HCL to pH < 2	OK
1224980001-E	HCL to pH < 2	OK	1224980007-F	HCL to pH < 2	OK
1224980001-F	HCL to pH < 2	OK	1224980007-G	HCL to pH < 2	OK
1224980001-G	HCL to pH < 2	OK	1224980007-H	HCL to pH < 2	OK
1224980001-H	HCL to pH < 2	OK	1224980008-A	HCL to pH < 2	OK
1224980002-A	HCL to pH < 2	OK	1224980008-B	HCL to pH < 2	OK
1224980002-B	HCL to pH < 2	OK	1224980008-C	HCL to pH < 2	OK
1224980002-C	HCL to pH < 2	OK	1224980008-D	HCL to pH < 2	OK
1224980002-D	HCL to pH < 2	OK	1224980008-E	HCL to pH < 2	OK
1224980002-E	HCL to pH < 2	OK	1224980008-F	HCL to pH < 2	OK
1224980002-F	HCL to pH < 2	OK	1224980008-G	HCL to pH < 2	OK
1224980002-G	HCL to pH < 2	OK	1224980008-H	HCL to pH < 2	OK
1224980002-H	HCL to pH < 2	OK	1224980009-A	HCL to pH < 2	OK
1224980003-A	HCL to pH < 2	OK	1224980009-B	HCL to pH < 2	OK
1224980003-B	HCL to pH < 2	OK	1224980009-C	HCL to pH < 2	OK
1224980003-C	HCL to pH < 2	OK	1224980009-D	HCL to pH < 2	OK
1224980003-D	HCL to pH < 2	OK	1224980009-E	HCL to pH < 2	OK
1224980003-E	HCL to pH < 2	OK	1224980009-F	HCL to pH < 2	OK
1224980003-F	HCL to pH < 2	OK	1224980009-G	HCL to pH < 2	OK
1224980003-G	HCL to pH < 2	OK	1224980009-H	HCL to pH < 2	OK
1224980003-H	HCL to pH < 2	OK	1224980009-I	No Preservative Required	OK
1224980004-A	HCL to pH < 2	OK	1224980009-J	No Preservative Required	OK
1224980004-B	HCL to pH < 2	OK	1224980010-A	HCL to pH < 2	OK
1224980004-C	HCL to pH < 2	OK	1224980010-B	HCL to pH < 2	OK
1224980004-D	HCL to pH < 2	OK	1224980010-C	HCL to pH < 2	OK
1224980004-E	HCL to pH < 2	OK	1224980010-D	HCL to pH < 2	OK
1224980004-F	HCL to pH < 2	OK	1224980010-E	HCL to pH < 2	OK
1224980004-G	HCL to pH < 2	OK	1224980010-F	HCL to pH < 2	OK
1224980004-H	HCL to pH < 2	OK	1224980011-A	HCL to pH < 2	OK
1224980005-A	HCL to pH < 2	OK	1224980011-B	HCL to pH < 2	OK
1224980005-B	HCL to pH < 2	OK	1224980011-C	HCL to pH < 2	OK
1224980005-C	HCL to pH < 2	OK	1224980011-D	HCL to pH < 2	OK
1224980005-D	HCL to pH < 2	OK	1224980011-E	HCL to pH < 2	OK
1224980005-E	HCL to pH < 2	OK	1224980011-F	HCL to pH < 2	OK
1224980005-F	HCL to pH < 2	OK	1224980011-G	HCL to pH < 2	OK
1224980005-G	HCL to pH < 2	OK	1224980011-H	HCL to pH < 2	OK
1224980005-H	HCL to pH < 2	OK	1224980011-I	No Preservative Required	OK
1224980006-A	HCL to pH < 2	OK	1224980011-J	No Preservative Required	OK
1224980006-B	HCL to pH < 2	OK			
1224980006-C	HCL to pH < 2	OK			
1224980006-D	HCL to pH < 2	OK			
1224980006-E	HCL to pH < 2	OK			
1224980006-F	HCL to pH < 2	OK			
1224980006-G	HCL to pH < 2	OK			
1224980006-H	HCL to pH < 2	OK			
1224980007-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.

ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Delaney Dent	CS Site Name:	Kotzebue Former HIS/BIA Hospital – School Pipeline Release	Lab Name:	SGS
Title:	Junior Environmental Scientist	ADEC File No.:	410.38.025	Lab Report No.:	1224980
Consulting Firm:	EMI	Hazard ID No.:	25558	Lab Report Date:	9/22/2022

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

1. Laboratory

- a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?

Yes No N/A

Comments: Click or tap here to enter text.

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

Yes No N/A

Comments: All samples were analyzed by SGS in Anchorage, AK

2. Chain of Custody (CoC)

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

Yes No N/A

Comments: Click or tap here to enter text.

- b. Were the correct analyses requested?

Yes No N/A

Analyses requested: GRO, VOC, DRO, RRO, PAH

Comments: Click or tap here to enter text.

3. Laboratory Sample Receipt Documentation

- a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes No N/A

Cooler temperature(s): 1.8°C

Sample temperature(s): Click or tap here to enter text.

Comments: Click or tap here to enter text.

- b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?

Yes No N/A

Comments: Click or tap here to enter text.

- c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?

Yes No N/A

Comments: No issues noted on sample 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, canister not holding a vacuum, etc.?

Yes No N/A

Comments: No issues noted

- e. Is the data quality or usability affected?

Yes No N/A

Comments: No issues noted

4. Case Narrative

- a. Is the case narrative present and understandable?

Yes No N/A

Comments: Click or tap here to enter text.

- b. Are there discrepancies, errors, or QC failures identified by the lab?

Yes No N/A

Comments:

Surrogate recovery for

-1,2-dichloroethane-d4 (8260D) for MW2, MW5, MW55, Trip Blank, MB may be biased high.

-2-methylnaphthalene-d10 (8270D SIM) for MW10 and duplicate MW101 does not meet QC criteria.

-MW4 sample pH is greater than two (AK 101); however, the sample was analyzed within 7 days from collection.

- c. Were all the corrective actions documented?

Yes No N/A

Comments: No corrective actions documented

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

Comments: Results show no detection of analytes associated with the surrogate 1,2-dichloroethane-d4 in the trip blank sample. This indicates a negligible effect on sample results. Overall, since many of these impacted project samples exceed ADEC cleanup levels, the recoveries are not likely to affect the data quality or usability for the project purpose of determining if concentrations exceed cleanup levels.

5. Sample Results

- a. Are the correct analyses performed/reported as requested on CoC?

Yes No N/A

Comments: Click or tap here to enter text.

- b. Are all applicable holding times met?

Yes No N/A

Comments: Click or tap here to enter text.

- c. Are all soils reported on a dry weight basis?

Yes No N/A

Comments: Water samples

- d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?

Yes No N/A

Comments: All analyte LOQs are reported below cleanup levels except 1,2,3-Trichloropropane reported above the cleanup level at 1.00 ug/L

- e. Is the data quality or usability affected?

Yes No N/A

Comments: Data quality is not affected due to all sample results, including the trip blank, at the same non-detect quantification. Data is considered usable for the project purpose.

6. QC Samples

- a. Method Blank

- i. Was one method blank reported per matrix, analysis, and 20 samples?

Yes No N/A

Comments: Click or tap here to enter text.

- ii. Are all method blank results less than LOQ (or RL)?

Yes No

Comments: Click or tap here to enter text.

- iii. If above LoQ or RL, what samples are affected?
Comments: Click or tap here to enter text.
- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No N/A
Comments: No issues noted
- v. Data quality or usability affected?
Yes No N/A
Comments: No issues noted

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

- i. Organics – Are 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: Click or tap here to enter text.
- ii. Metals/Inorganics – Are one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes No N/A
Comments: No metal/inorganic analyses conducted
- iii. Accuracy – Are 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: Click or tap here to enter text.
- iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the 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: Click or tap here to enter text.
- v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: Click or tap here to enter text.
- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No N/A

Comments: All within prescribed limits

vii. Is the data quality or usability affected?

Yes No N/A

Comments: No issues noted

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

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

Yes No N/A

Comments: No MS/MSD reported

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

Yes No N/A

Comments: No metal/inorganic analyses conducted

iii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes No N/A

Comments: No MS/MSD reported

iv. Precision – Are 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.

Yes No N/A

Comments: No MS/MSD reported

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

Comments: Click or tap here to enter text.

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

Yes No N/A

Comments: No MS/MSD reported

vii. Is the data quality or usability affected?

Yes No N/A

Comments: No MS/MSD reported

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: Click or tap here to enter text.

- ii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes No N/A

Comments: All surrogate recoveries are reported. 1,2-Dichloroethane-D4 is above percent recovery limits for samples MW2, MW5, MW55, Trip Blank, and the Method Blank for HBN 1842148 (MW2, MW5, MW55, Trip Blank).

2-Methylnaphthalene-d10 is below percent recovery limits for MW10 and MW 101.

- 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: Click or tap here to enter text.

- iv. Is the data quality or usability affected?

Yes No N/A

Comments: Since many of these impacted project samples exceed ADEC cleanup levels, the recoveries are not likely to affect the data quality or usability for the project purpose of determining if concentrations exceed cleanup levels.

e. Trip Blanks

- i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes No N/A

Comments: Click or tap here to enter text.

- ii. Are all results less than LoQ or RL?

Yes No N/A

Comments: 1,2,3-Trichloropropane LOQ is above the cleanup level.

- iii. If above LoQ or RL, what samples are affected?

Comments: All samples gave the same non-detect result.

- iv. Is the data quality or usability affected?

Yes No N/A

Comments: Data quality is not affected due to all sample results, including the trip blank, reported at the same non-detect quantification.

f. Field Duplicate

- i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?

Yes No N/A

Comments: Click or tap here to enter text.

- ii. Was the duplicate submitted blind to lab?

Yes No N/A

Comments: Click or tap here to enter text.

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

$$RPD (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Is the data quality or usability affected? (Explain)

Yes No N/A

Comments: MW10 and/or MW101 detected five PAH compounds, and the RPD is above 30% for each one.

- iv. Is the data quality or usability affected? (Explain)

Yes No N/A

Comments: Data quality is not affected due to all analytical results for the five detected PAH compounds in MW10 and MW101 not exceeding cleanup levels, except for Naphthalene which was also detected in exceedance via SW8260D. Therefore, the elevated RPD is not likely to affect the data quality or usability for the project purpose of determining if concentrations exceed cleanup levels.

g. Decontamination or Equipment Blanks

- i. Were decontamination or equipment blanks collected?

Yes No N/A

Comments: Disposable sampling equipment used

- ii. Are all results less than LoQ or RL?

CS Site Name: Kotzebue Former HIS/BIA Hospital – School Pipeline Release
Lab Report No.: 1224980

Yes No N/A

Comments: Disposable sampling equipment used

iii. If above LoQ or RL, specify what samples are affected.

Comments: Click or tap here to enter text.

iv. Are data quality or usability affected?

Yes No N/A

Comments: Disposable sampling equipment used

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

a. Are they defined and appropriate?

Yes No N/A

Comments: Click or tap here to enter text.



Laboratory Report of Analysis

To: Environmental Mgmt Inc (EMI)
206 East Fireweed Lane Suite 201
Anchorage, AK 99503
907-272-9336

Report Number: **1224988**

Client Project: **17855 Kotzebue Landfarm**

Dear Delaney Dent,

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
2022.09.02
14:09:32 -08'00'

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **Environmental Mgmt Inc (EMI)**
SGS Project: **1224988**
Project Name/Site: **17855 Kotzebue Landfarm**
Project Contact: **Delaney Dent**

Refer to sample receipt form for information on sample condition.

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

Print Date: 09/02/2022 8:54:06AM

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, indemnification 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) & 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 and, when applicable, other regulatory authorities.

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

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
17855-LF2019-4	1224988001	08/15/2022	08/19/2022	Soil/Solid (dry weight)
17855-LF2019-44	1224988002	08/15/2022	08/19/2022	Soil/Solid (dry weight)
17855-LF2019-2	1224988003	08/15/2022	08/19/2022	Soil/Solid (dry weight)
Trip Blank	1224988004	08/15/2022	08/19/2022	Soil/Solid (dry weight)

<u>Method</u>	<u>Method Description</u>
AK102	Diesel Range Organics (S)
SM21 2540G	Percent Solids SM2540G

Print Date: 09/02/2022 8:54:09AM

Detectable Results Summary

Client Sample ID: **17855-LF2019-4**

Lab Sample ID: 1224988001

Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	239	mg/kg

Client Sample ID: **17855-LF2019-44**

Lab Sample ID: 1224988002

Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	162	mg/kg

Client Sample ID: **17855-LF2019-2**

Lab Sample ID: 1224988003

Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	167	mg/kg



Results of **17855-LF2019-4**

Client Sample ID: **17855-LF2019-4**
Client Project ID: **17855 Kotzebue Landfarm**
Lab Sample ID: 1224988001
Lab Project ID: 1224988

Collection Date: 08/15/22 10:12
Received Date: 08/19/22 13:15
Matrix: Soil/Solid (dry weight)
Solids (%):91.2
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	239	21.6	9.72	mg/kg	1		08/29/22 02:39
Surrogates							
5a Androstane (surr)	108	50-150		%	1		08/29/22 02:39

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/29/22 02:39
Container ID: 1224988001-A

Prep Batch: XXX46872
Prep Method: SW3550C
Prep Date/Time: 08/26/22 14:07
Prep Initial Wt./Vol.: 30.438 g
Prep Extract Vol: 5 mL

Print Date: 09/02/2022 8:54:12AM



Results of **17855-LF2019-44**

Client Sample ID: **17855-LF2019-44**
Client Project ID: **17855 Kotzebue Landfarm**
Lab Sample ID: 1224988002
Lab Project ID: 1224988

Collection Date: 08/15/22 10:22
Received Date: 08/19/22 13:15
Matrix: Soil/Solid (dry weight)
Solids (%):93.4
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	162		21.2	9.56	mg/kg	1		08/29/22 02:49
Surrogates								
5a Androstane (surr)	90.7		50-150		%	1		08/29/22 02:49

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/29/22 02:49
Container ID: 1224988002-A

Prep Batch: XXX46872
Prep Method: SW3550C
Prep Date/Time: 08/26/22 14:07
Prep Initial Wt./Vol.: 30.233 g
Prep Extract Vol: 5 mL

Print Date: 09/02/2022 8:54:12AM



Results of **17855-LF2019-2**

Client Sample ID: **17855-LF2019-2**
Client Project ID: **17855 Kotzebue Landfarm**
Lab Sample ID: 1224988003
Lab Project ID: 1224988

Collection Date: 08/15/22 10:20
Received Date: 08/19/22 13:15
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	167	23.3	10.5	mg/kg	1		08/29/22 02:59
Surrogates							
5a Androstane (surr)	84.7	50-150		%	1		08/29/22 02:59

Batch Information

Analytical Batch: XFC16326
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/29/22 02:59
Container ID: 1224988003-A

Prep Batch: XXX46872
Prep Method: SW3550C
Prep Date/Time: 08/26/22 14:07
Prep Initial Wt./Vol.: 30.373 g
Prep Extract Vol: 5 mL

Print Date: 09/02/2022 8:54:12AM



Method Blank

Blank ID: MB for HBN 1842004 [SPT/11610]
Blank Lab ID: 1681198
QC for Samples:
1224988001

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT11610
Analytical Method: SM21 2540G
Instrument:
Analyst: BRP
Analytical Date/Time: 8/23/2022 5:40:00PM

Print Date: 09/02/2022 8:54:14AM



Duplicate Sample Summary

Original Sample ID: 1224855001

Duplicate Sample ID: 1681199

QC for Samples:

1224988001

Analysis Date: 08/23/2022 17:40

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	99.9	99.8	%	0.10	(< 15)

Batch Information

Analytical Batch: SPT11610

Analytical Method: SM21 2540G

Instrument:

Analyst: BRP

Print Date: 09/02/2022 8:54:15AM



Duplicate Sample Summary

Original Sample ID: 1224991001

Duplicate Sample ID: 1681200

QC for Samples:

1224988001

Analysis Date: 08/23/2022 17:40

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	95.6	95.7	%	0.14	(< 15)

Batch Information

Analytical Batch: SPT11610

Analytical Method: SM21 2540G

Instrument:

Analyst: BRP

Print Date: 09/02/2022 8:54:15AM



Method Blank

Blank ID: MB for HBN 1842108 [SPT/11612]

Blank Lab ID: 1681673

QC for Samples:

1224988002, 1224988003

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	99.9			%

Batch Information

Analytical Batch: SPT11612

Analytical Method: SM21 2540G

Instrument:

Analyst: ICC

Analytical Date/Time: 8/25/2022 4:30:00PM

Print Date: 09/02/2022 8:54:18AM



Duplicate Sample Summary

Original Sample ID: 1225033002

Duplicate Sample ID: 1681674

QC for Samples:

1224988002, 1224988003

Analysis Date: 08/25/2022 16:30

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	46.0	48.9	%	6.20	(< 15)

Batch Information

Analytical Batch: SPT11612

Analytical Method: SM21 2540G

Instrument:

Analyst: ICC

Print Date: 09/02/2022 8:54:20AM



Method Blank

Blank ID: MB for HBN 1842130 [XXX/46872]

Blank Lab ID: 1681770

QC for Samples:

1224988001, 1224988002, 1224988003

Matrix: Soil/Solid (dry weight)

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	9.00	mg/kg
Surrogates				
5a Androstane (surr)	94.8	60-120		%

Batch Information

Analytical Batch: XFC16326

Analytical Method: AK102

Instrument: Agilent 7890B R

Analyst: HMW

Analytical Date/Time: 8/29/2022 1:49:00AM

Prep Batch: XXX46872

Prep Method: SW3550C

Prep Date/Time: 8/26/2022 2:07:40PM

Prep Initial Wt./Vol.: 30 g

Prep Extract Vol: 5 mL

Print Date: 09/02/2022 8:54:23AM



Blank Spike Summary

Blank Spike ID: LCS for HBN 1224988 [XXX46872]
 Blank Spike Lab ID: 1681771
 Date Analyzed: 08/29/2022 01:59

Spike Duplicate ID: LCSD for HBN 1224988
 [XXX46872]
 Spike Duplicate Lab ID: 1681772
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1224988001, 1224988002, 1224988003

Results by AK102

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	667	687	103	667	711	107	(75-125)	3.40	(< 20)

Surrogates

5a Androstane (surr)	16.7	97	16.7	100	(60-120)	2.70
----------------------	------	----	------	-----	------------	------

Batch Information

Analytical Batch: **XFC16326**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B R**
 Analyst: **HMW**

Prep Batch: **XXX46872**
 Prep Method: **SW3550C**
 Prep Date/Time: **08/26/2022 14:07**
 Spike Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 16.7 mg/kg Extract Vol: 5 mL

Print Date: 09/02/2022 8:54:26AM



SGS North America Inc. CHAIN OF CUSTODY RECORD

1224988



Profile #369569 gm

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

CLIENT: EMI

CONTACT: Delaney Dent PHONE #: 907-272-9336

PROJECT NAME: Kotzebue Landfarm PROJECT/PWSID/PERMIT#: 17855

REPORTS TO: Delaney Dent & Shayla Marshall E-MAIL: ddent@emi-alaska.com Profile #: smarshall@emi-alaska.com

INVOICE TO: Erin Smith esmith@emi-alaska.com QUOTE #: P.O. #:

Section 3 Preservative

Section 1

CONTAINERS

Comp Grab MI (Multi-incremental)

Analysis*

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/MATRIX CODE	#	Comp	Grab	MI	(Multi-incremental)	Analysis*	REMARKS/LOC ID
	1AB	17855-LF2019-4	8/15/22	10:12	1	grab	✓				
	2AB	17855-LF2019-44	8/15/22	10:22	1	grab	✓				
	3AB	17855-LF2019-2	8/15/22	10:20	1	grab	✓				
	4A										

Section 2

Section 5

Relinquished By: (1) [Signature] Date 8/17/22 Time 16:00 Received By: [Signature]

Relinquished By: (2) [Signature] Date 8/19/22 Time 13:15 Received By: [Signature]

Relinquished By: (3) [Signature] Date [] Time [] Received By: []

Relinquished By: (4) [Signature] Date 8/15/22 Time 13:15 Received For Laboratory By: [Signature]

Section 4 DOD Project? Yes (NO) Data Deliverable Requirements: level II

Cooler ID: Requested Turnaround Time and/or Special Instructions: Standard Turnaround Time

Temp Blank °C: 5.2 DG2 Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [X] Commercial Delivery []



SGS Workorder #:

1224988

1224988

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
-----------------	--------------------------	------------------------

Chain of Custody / Temperature Requirements	Note: Temperature and COC seal information is found on the chain of custody form	
--	--	--

DOD only: Did all sample coolers have a corresponding COC?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note containers received with ice:		
Identify any containers received at non-compliant temperature: (Use form FS-0029 if more space is needed)		

Holding Time / Documentation / Sample Condition Requirement	Note: Refer to form F-083 "Sample Guide" for specific holding times and sample containers.	
--	--	--

Were samples received within analytical holding time?	Yes	
Do sample labels match COC? Record discrepancies.	Yes	
Note: If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.		
Were analytical requests clear? <i>(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8))</i>	Yes	
Were proper containers (type/mass/volume/preservative)used? Note: Exemption for metals analysis by 200.8/6020 in water.	Yes	

Volatile Analysis Requirements (VOC, GRO, LL-Hg, etc.)		
---	--	--

Were all soil VOAs received with a corresponding % solids container?	Yes	
Were Trip Blanks (e.g., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (e.g., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with Methanol+BFB?	Yes	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):
--



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1224988001-A	No Preservative Required	OK			
1224988001-B	Methanol field pres. 4 C	OK			
1224988002-A	No Preservative Required	OK			
1224988002-B	Methanol field pres. 4 C	OK			
1224988003-A	No Preservative Required	OK			
1224988003-B	Methanol field pres. 4 C	OK			
1224988004-A	Methanol field pres. 4 C	OK			

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.

ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Delaney Dent	CS Site Name:	Kotzebue Former HIS/BIA Hospital – School Pipeline Release	Lab Name:	SGS
Title:	Junior Environmental Scientist	ADEC File No.:	410.38.025	Lab Report No.:	1224988
Consulting Firm:	EMI	Hazard ID No.:	25558	Lab Report Date:	9/02/2022

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

1. Laboratory

- a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?
Yes No N/A
Comments: Click or tap here to enter text.
- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?
Yes No N/A
Comments: All samples were analyzed by SGS in Anchorage, AK

2. Chain of Custody (CoC)

- a. Is the CoC information completed, signed, and dated (including released/received by)?
Yes No N/A
Comments: Click or tap here to enter text.
- b. Were the correct analyses requested?
Yes No N/A
Analyses requested: DRO - AK102
Comments: Click or tap here to enter text.

3. Laboratory Sample Receipt Documentation

- a. Is the sample/cooler temperature documented and within range at receipt (0° to 6° C)?
Yes No N/A
Cooler temperature(s): 5.2°C

Sample temperature(s): Click or tap here to enter text.

Comments: Click or tap here to enter text.

- b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?

Yes No N/A

Comments: Click or tap here to enter text.

- c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?

Yes No N/A

Comments: No issues noted on sample 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, canister not holding a vacuum, etc.?

Yes No N/A

Comments: No issues noted

- e. Is the data quality or usability affected?

Yes No N/A

Comments: No issues noted

4. Case Narrative

- a. Is the case narrative present and understandable?

Yes No N/A

Comments: Click or tap here to enter text.

- b. Are there discrepancies, errors, or QC failures identified by the lab?

Yes No N/A

Comments: No issues noted

- c. Were all the corrective actions documented?

Yes No N/A

Comments: No issues noted

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

Comments: N/A - No issues noted

5. Sample Results

- a. Are the correct analyses performed/reported as requested on CoC?

Yes No N/A

Comments: Click or tap here to enter text.

- b. Are all applicable holding times met?
Yes No N/A
Comments: Click or tap here to enter text.
- c. Are all soils reported on a dry weight basis?
Yes No N/A
Comments: Click or tap here to enter text.
- d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?
Yes No N/A
Comments: Click or tap here to enter text.
- e. Is the data quality or usability affected?
Yes No N/A
Comments: No issues noted

6. QC Samples

- a. Method Blank
 - i. Was one method blank reported per matrix, analysis, and 20 samples?
Yes No N/A
Comments: Click or tap here to enter text.
 - ii. Are all method blank results less than LOQ (or RL)?
Yes No
Comments: Click or tap here to enter text.
 - iii. If above LoQ or RL, what samples are affected?
Comments: Click or tap here to enter text.
 - iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No N/A
Comments: No issues noted
 - v. Data quality or usability affected?
Yes No N/A
Comments: No issues noted

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

- i. Organics – Are 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: Click or tap here to enter text.

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

Yes No N/A

Comments: No metal/inorganic analyses conducted

- iii. Accuracy – Are 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: Click or tap here to enter text.

- iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the 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: Click or tap here to enter text.

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

Comments: Click or tap here to enter text.

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

Yes No N/A

Comments: All within prescribed limits

- vii. Is the data quality or usability affected?

Yes No N/A

Comments: No issues noted

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

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

Yes No N/A

Comments: No MS/MSD reported

- ii. **Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?**
Yes No N/A
Comments: No metals/inorganics analyses conducted
 - iii. **Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?**
Yes No N/A
Comments: No MS/MSD reported
 - iv. **Precision – Are 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.**
Yes No N/A
Comments: No MS/MSD reported
 - v. **If %R or RPD is outside of acceptable limits, what samples are affected?**
Comments: Click or tap here to enter text.
 - vi. **Do the affected sample(s) have data flags? If so, are the data flags clearly defined?**
Yes No N/A
Comments: No MS/MSD reported
 - vii. **Is the data quality or usability affected?**
Yes No N/A
Comments: Click or tap here to enter text.
- 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: Click or tap here to enter text.
 - ii. **Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)**
Yes No N/A
Comments: Click or tap here to enter text.
 - iii. **Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?**

CS Site Name: Kotzebue Former HIS/BIA Hospital – School Pipeline Release
Lab Report No.: 1224988

Yes No N/A

Comments: No issues noted

iv. Is the data quality or usability affected?

Yes No N/A

Comments: No issues noted

e. Trip Blanks

i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes No N/A

Comments: No volatile samples analyzed

ii. Are all results less than LoQ or RL?

Yes No N/A

Comments: No volatile samples analyzed

iii. If above LoQ or RL, what samples are affected?

Comments: Click or tap here to enter text.

iv. Is the data quality or usability affected?

Yes No N/A

Comments: No volatile samples analyzed

f. Field Duplicate

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

Yes No N/A

Comments: Click or tap here to enter text.

ii. Was the duplicate submitted blind to lab?

Yes No N/A

Comments: Click or tap here to enter text.

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

$$RPD (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Is the data quality or usability affected? (Explain)

Yes No N/A

Comments: Click or tap here to enter text.

- iv. Is the data quality or usability affected? (Explain)

Yes No N/A

Comments: RPD within recommended limits

g. Decontamination or Equipment Blanks

- i. Were decontamination or equipment blanks collected?

Yes No N/A

Comments: Disposable sampling equipment used

- ii. Are all results less than LoQ or RL?

Yes No N/A

Comments: Disposable sampling equipment used

- iii. If above LoQ or RL, specify what samples are affected.

Comments: Click or tap here to enter text.

- iv. Are data quality or usability affected?

Yes No N/A

Comments: Disposable sampling equipment used

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

- a. Are they defined and appropriate?

Yes No N/A

Comments: Click or tap here to enter text.

APPENDIX E

Resumes of QEPs

SHAYLA MARSHALL

QUALIFIED ENVIRONMENTAL PROFESSIONAL

smarshall@emi-alaska.com

EDUCATION

- M.S. in Environmental Science, 2004, Alaska Pacific University
- B.A. in Environmental Studies, 2002, Concordia College

PROFESSIONAL CERTIFICATIONS

- 40 Hour HAZWOPER Certification
- Army Corps of Engineers Wetland Delineation and Management Training
- Wetland Delineation Professional Certification
- Wetland Plants of the Pacific Northwest Professional Certification
- Advanced Wetland Soils and Hydrology for Delineators Professional Certification

EXPERIENCE AND QUALIFICATIONS

Ms. Marshall began her environmental consulting career in 2004. In 2015, she joined EMI. She has deep experience in the environmental field, specializing in environmental assessments, investigation and cleanups, landfill compliance, statistical analysis, geographical information systems (GIS), and wetland delineations and permitting. As an Environmental Professional (ASTM) and ADEC Qualified Environmental Professional, she has worked on or managed numerous site investigations and remedial actions throughout urban and rural Alaska and is familiar with the logistical issues associated with conducting environmental work in the state. She has the authority to conduct and/or manage Phase I Environmental Site Assessments (ESA) following ASTM 1527-13 standards, wetland delineations, natural resource permitting, site assessments and investigations, contaminated site cleanups, and environmental reviews.

SPECIFIC ENVIRONMENTAL PROJECT EXPERIENCE

Haines Tank Farm Spill Response and Cleanup, Haines, Alaska | Delta Western, LLC | 2020 – Present

Project manager associated with the spill response associated with a breach of the secondary containment at a tank farm in Haines. An estimated 735 gallons of diesel fuel was released from the tank. In order to prevent any further migration of fuel, earthen dams were constructed and sorbent booms were deployed at the time of the spill along the drainage swales around the secondary containment area. Contaminated soil was removed along the swales and placed in supersacks for transport to Juneau for treatment. Due to the presence of product in the swales, skimmers were deployed and the skimmed product-water mixture was transported to Ketchikan for recycling. As the project site was proximate to the waterfront, the project entailed close coordination with the US Coast Guard, community, landowner, and ADEC.

Shungnak Tank Farm Release Spill Assessment and Cleanup, Shungnak, Alaska | Village of Shungnak | 2020 – Present

Project manager for the spill response associated with an approximately 15,000-gallon fuel release at the Shungnak School heating oil tank farm. Due to the close proximity of the spill to the Kobuk River, Shungnak's source for drinking water, the project was expedited to remove the most grossly impacted soil and assess the potential impact to the drinking water source. In 2020, the project involved a survey of the spill area and landfarm area, including mapping using drones. Test pits and hand tools were also

used to assess the soil conditions and delineate the extent of contamination. In 2021, the scope entailed further delineation of select areas at the site and development of a cleanup plan for the removal and local landfarming of impacted soil.

Release Investigation, Cleanup, and Closure of Spill at Pilot Mountain Tower, Outside of Galena, Alaska | DRS Global | 2018 – 2019

Project manager for the spill response at the Pilot Mountain telecommunications tower. In 2018, conducted a release investigation in response to a spill caused by bear activity at the fuel line. Based on the results of the sampling activities, mobilized to the site in 2019 to begin cleanup activities. Due to the remote nature of the site, a mini-excavator was slung to the top of the mountain via helicopter to facilitate filling of supersacks of contaminated soil. The supersacks were transported to the barge landing in Galena, then transported to OIT via barge and then truck. Due to the limited availability of fill material in the region and cost to transport fill to the site, coordinated with the landowner (Doyon, Limited) to obtain a fill permit to use material from the site for backfill of the excavation. Based on the results of the 2019 removal actions, the site was eligible for closure with institutional controls. Coordinated with the ADEC, landowner, and responsible party to develop a closure document that outlined the covenants on the site that is agreeable to all three parties.

Site Investigation and Cleanup, Kenai, Alaska | Arctic Slope Regional Corporation | 2015 – 2019

Project manager for the site investigation and cleanup work associated with industrial activities that resulted in POL, solvent, and TENORM contamination at the site, including within buildings. Field activities included several field efforts identifying extent of contamination using test pits and soil borings, and soil removal from discrete locations across the property. Due to the presence of an on-site drinking water well, collected drinking water well samples to determine if the contamination extended to the drinking water aquifer.

Buried Debris Evaluation and Site Characterization, Deadhorse, Alaska | CH2MHill-Jacobs | 2018

Project manager for the geophysical survey and environmental site characterization activities on Tract 22. The environmental activities included collecting soil and porewater samples from borings, and collecting sediment and surface water samples from a nearby unnamed water body. Coordinated the geophysical survey, including conducting the data processing of EM31 (conductivity and magnetivity) and resistivity data and associated writeup to determine the lateral and vertical extent of buried debris.

Remediation of Pipeline Release, Kotzebue, Alaska | Maniilaq Association | 2017 – Present

Project manager for remediation from the Former Indian Health Service/Bureau of Indian Affairs (IHS/BIA) Hospital – School Pipeline Release in Kotzebue. In 2017, a work plan was developed to remove an underground storage tank (UST). In 2018, a geophysical survey was conducted to identify the location of the UST, associated piping, and dispensers. In 2019, the UST was removed, groundwater samples were collected from the area, and a landfarm was developed to treat the impacted soil removed during the UST excavation activities. The 2020 field activities were conducted in two phases. In the spring, the field activities focused on the investigation into the extent of contamination on the three formerly IHS-occupied lots using soil borings. In addition, due to the previous presence of free product at the site, passive product recovery was conducted. In the fall, conducted the first phase of cleanup on the lots, with the cleanup being phased due to the availability of local resources and short field season. The cleanup entailed removal of contaminated soil and placement of a locally-managed landfarm and placement of a curtain to minimize the migration of contamination into the cleaned area. Conducted additional groundwater monitoring in the fall of 2020 to assess the trend of contamination in the groundwater as the contaminated soil and sources (i.e., tank) after removal.

DELANEY DENT, E.I.T.

QUALIFIED ENVIRONMENTAL PROFESSIONAL, ENGINEER IN TRAINING

ddent@emi-alaska.com

EDUCATION

- B.S. in Chemical Engineering, 2019, University of Wyoming

PROFESSIONAL CERTIFICATIONS

- 40 Hour HAZWOPER Certification
- EPA / AHERA Inspector
- Nielsen Environmental Field School Environmental Sampling Certification

EXPERIENCE AND QUALIFICATIONS

Ms. Dent has nearly two years of experience in environmental consulting. Prior to joining EMI, she worked at a chemical plant in Wyoming, conducting long-term groundwater and air monitoring, as well as serving overseas in health promotion in the village of Malembo in Malawi. At EMI, she specializes in sampling soil, groundwater, and hazardous building materials, plus site characterizations using soil borings and monitoring wells, characterizing stockpiles and excavations in association with USTs, providing oversight and recommendations for Spill Prevention, Control, and Countermeasure Plans for facilities using ASTs, and assisting with engineering design and CAD design of landfill projects. She also conducts quality control review of laboratory data, writes work plans, compiles project specific deliverables, and is EMI's secondary CAD designer.

SPECIFIC ENVIRONMENTAL PROJECT EXPERIENCE

Former IHS/BIA Pipeline Spill Remediation and Long-Term Groundwater Monitoring, Kotzebue, Alaska | Maniilaq Association | 2021 – Present

Compiled work plans for two consecutive years to conduct site characterization of potentially fuel impacted soils and groundwater at the Former IHS/BIA Hospital-School, Kotzebue, Alaska. Conducted field activities, which included groundwater sampling, excavation, and landfarm soil sampling, plus a site reconnaissance of current conditions at the site. Finally, conducted data analysis and area-focused investigation and is involved in the effort to determine next steps for the site.

Selawik Diesel Overflow Site Assessment, Selawik, Alaska | City of Selawik | 2021 – Present

Assisted in compiling the work plan for the site assessment activities for the Water Treatment Plant in Selawik, Alaska. Conducted the field activities, which included installation and sampling of long-term monitoring wells to delineate the horizontal extent of surface water contamination currently at the remote site.

College Station Groundwater Monitoring, Fairbanks, Alaska | USPS | 2021 – Present

Conducting quarterly groundwater sampling at an on-site monitoring well, transporting samples, and upon completion, evaluating the sample data and drafting the report.

Storm Water Outfall Foam Investigation, Anchorage, Alaska | Private Client | 2021 – Present

Assisted in the investigation of a source of foam located at the outfall of a storm sewer system draining a large area. Worked to maintain a remote camera used to monitor foam and water quality for PFAS and glycol.

Spenard Buckets Characterization, Anchorage, Alaska | Central Environmental, Inc. | 2021

Assisted the field lead collecting characterization samples from several unlabeled containers of unidentified liquids found during demolition. Inventoried containers that had labels and contained their original contents.

Seward Well Decommissioning, Seward, Alaska | Private Client | 2021

Under the guidance of a QEP, conducted field activities consisting of directing and documenting the decommissioning of two monitoring wells. Lead author on report discussing the activities and conclusions.

IHS-BIA Pipeline Oil Spill, Kotzebue, Alaska | Maniilaq Association | 2021

Worked under the direction of a QEP on contaminated soil removal, sampling, and groundwater monitoring conducted at the former hospital – school pipeline release. Conducted soil removal activities with subsequent field screening and analytical sampling at the limits of excavation. Managed asbestos containing material discovered during excavation activities as a certified EPA/AHERA Inspector. To provide an efficient use of resources, also assisted in landfarm soil sampling and groundwater monitoring of on-site wells. Upon completion of field activities, provided a report documenting work done, analyzing analytical results, and final conclusions.

3319 Industrial Avenue Heating Oil Overfill Cleanup, Fairbanks, Alaska | National Express, LLC | 2021

Worked alongside a QEP on an environmental cleanup in Fairbanks associated with a heating oil overfill. Drafted the work plan on cleanup activities, field screened soil onsite after contaminated soil removal, and collected analytical samples from the sidewalls and excavation base. Field activities also included coordination with the vac truck company, backfill source, and trucking company. Once sample results were received, served as the primary author of the cleanup report.

Adler School Demo Soil Cleanup, North Pole, Alaska | Central Environmental, Inc. | 2021

Assisted in compiling the work plan for the sampling approach on removing soil and characterizing the extent of fuel impacted soils associated with the heating oil tank at the former Adler School, North Pole, Alaska. Assisted the accompanying ADEC Qualified Environmental Professional in performing the site work, transporting samples, and upon completion, evaluating the sample data and drafting the report.

Water Treatment Plant Diesel Overflow, Selawik, Alaska | City of Selawik | 2021 – Present

Assisted in compiling a work plan for the analysis of samples to delineate the extent of contamination at the diesel overflow site in Selawik, Alaska, under the supervision of an ADEC Qualified Environmental Professional.

Home Heating Oil Tank, Chugiak, Alaska | Private Client | 2021

Conducted a site investigation for the removal of a home heating oil tank at a property in Chugiak, Alaska. To check for potential contamination from a home heating oil tank, checked condition of the tank, the removed soils, and the soils at the limits of the excavation. Collected samples for field testing with the PID, documented the photoionization readings, and collected laboratory samples from the locations most likely to be contaminated. Sampling and testing procedures followed ADEC's *Field Sampling Guidance*. Work was checked by an ADEC Qualified Environmental Professional.

APPENDIX F

Human Health Conceptual Site Model Graphic Form and

Human Health Conceptual Site Model Scoping Form and Standardized Graphic

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Kotzebue Former IHS/BIA Hospital – School Pipeline Release (Lot 3)
 File No: 410.38.025

Completed By: Shayla Marshall
 Date Completed: 11/1/2022

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.
Media	Transport Mechanisms
<input checked="" type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to subsurface <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Ground-water	<input checked="" type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input checked="" type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Surface Water	<input checked="" type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(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.																
Exposure Media	Exposure Pathway/Route	Current & Future Receptors																
		Residents (adults or children) Commercial or Industrial workers Site visitors, trespassers, or recreational users Construction workers Farmers or subsistence harvesters Subsistence consumers Other																
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil <input type="checkbox"/> Inhalation of Fugitive Dust	<table border="1"> <tr> <td>C/F</td> <td>C/F</td> <td>C/F</td> <td>C/F</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>C/F</td> <td>C/F</td> <td>C/F</td> <td>C/F</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	C/F	C/F	C/F	C/F					C/F	C/F	C/F	C/F				
C/F	C/F	C/F	C/F															
C/F	C/F	C/F	C/F															
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	<table border="1"> <tr> <td>I</td> <td>I</td> <td>I</td> <td>I</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>C/F</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	I	I	I	I								C/F				
I	I	I	I															
			C/F															
<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air <input checked="" type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust	<table border="1"> <tr> <td>C/F</td> <td>C/F</td> <td>C/F</td> <td>C/F</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>C/F</td> <td>C/F</td> <td>C/F</td> <td>C/F</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	C/F	C/F	C/F	C/F					C/F	C/F	C/F	C/F				
C/F	C/F	C/F	C/F															
C/F	C/F	C/F	C/F															
<input checked="" type="checkbox"/> surface water	<input checked="" type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	<table border="1"> <tr> <td>I</td> <td>I</td> <td>I</td> <td>I</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	I	I	I	I												
I	I	I	I															
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods	<table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name:

File Number:

Completed by:

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*)

- | | |
|--|---|
| <input type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input checked="" type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input checked="" type="checkbox"/> Other: <input type="text" value="Former BIA-IHS Pipeline"/> |

Release Mechanisms (*check potential release mechanisms at the site*)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge |
| <input checked="" type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input type="checkbox"/> Other: <input type="text"/> |

Impacted Media (*check potentially-impacted media at the site*)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input checked="" type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs) | <input checked="" type="checkbox"/> Surface water |
| <input checked="" type="checkbox"/> Air | <input type="checkbox"/> Biota |
| <input type="checkbox"/> Sediment | <input type="checkbox"/> Other: <input type="text"/> |

Receptors (*check receptors that could be affected by contamination at the site*)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Residents (adult or child) | <input checked="" type="checkbox"/> Site visitor |
| <input checked="" type="checkbox"/> Commercial or industrial worker | <input checked="" type="checkbox"/> Trespasser |
| <input checked="" type="checkbox"/> Construction worker | <input type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input type="checkbox"/> Other: <input type="text"/> |

* 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:

Contaminants include: DRO, 1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene

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:

1-Methylnaphthalene and 2-Methylnaphthalene both present

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 groundwater 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:

Complete

Comments:

MW7 is present on Lot 3 and has contained the following analytes at concentrations greater than cleanup levels: DRO, RRO, and tetrachloroethene (PCE). The community drinking water is from surface water bodies and not from groundwater wells.

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:

Prior to installation of the piles along Shore Avenue, sheen had been reported in Kotzebue Sound, downgradient of the site.

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:

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:

Volatile soil contaminants encountered on Lot 3 include: 1-methylnapthalene, 2-methylnapthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene.

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 contaminated 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:

Volatile compounds were not encountered in the borings closest to Buildings 307, 312, 315, and 317. The closest boring with volatiles (naphthalene) was Boring B5--that boring is 39 feet from Buildings 307 and 312. Although volatile compounds have been detected on Lot 3, the locations of those detections are well over 30 horizontal feet from the residential structures on Lot 3.

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:

Due to shallow groundwater, groundwater may be exposed during construction.

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:

Not applicable

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 - PM₁₀). 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:

Not applicable

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:

Not applicable

4. Other Comments (*Provide other comments as necessary to support the information provided in this form.*)

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Kotzebue Former IHS/BIA Hospital – School Pipeline Release (Lot 4)
 File No: 410.38.025

Completed By: Shayla Marshall
 Date Completed: 11/1/2022

Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Media	(2) Transport Mechanisms			
<input checked="" type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to subsurface <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____			
	<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____		
	<input checked="" type="checkbox"/> Ground-water	<input checked="" type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input checked="" type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____		
		<input checked="" type="checkbox"/> Surface Water	<input checked="" type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____	
			<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Exposure Media	(4) Exposure Pathway/Route	(5) Current & Future Receptors						
		Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil <input type="checkbox"/> Inhalation of Fugitive Dust	C/F	C/F	C/F	C/F			
	<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water					C/F	
		<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air <input checked="" type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust	C/F	C/F	C/F	C/F	
<input checked="" type="checkbox"/> surface water			<input checked="" type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water					
	<input type="checkbox"/> sediment		<input type="checkbox"/> Direct Contact with Sediment					
	<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods						

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name:

File Number:

Completed by:

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*)

- | | |
|--|---|
| <input checked="" type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input checked="" type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input checked="" type="checkbox"/> Other: <input type="text" value="Former IHS-BIA Pipeline"/> |

Release Mechanisms (*check potential release mechanisms at the site*)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge |
| <input checked="" type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input type="checkbox"/> Other: <input type="text"/> |

Impacted Media (*check potentially-impacted media at the site*)

- | | |
|---|--|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input checked="" type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs) | <input checked="" type="checkbox"/> Surface water |
| <input checked="" type="checkbox"/> Air | <input type="checkbox"/> Biota |
| <input type="checkbox"/> Sediment | <input type="checkbox"/> Other: <input type="text"/> |

Receptors (*check receptors that could be affected by contamination at the site*)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Residents (adult or child) | <input checked="" type="checkbox"/> Site visitor |
| <input checked="" type="checkbox"/> Commercial or industrial worker | <input checked="" type="checkbox"/> Trespasser |
| <input checked="" type="checkbox"/> Construction worker | <input type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input type="checkbox"/> Other: <input type="text"/> |

* 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:

Contaminants detected on Lot 4 include: DRO, 1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene

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:

1-Methylnaphthalene and 2-Methylnaphthalene both present.

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 groundwater 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:

Complete

Comments:

There are no wells on Lot 4. However, wells on adjoining lots have contained DRO, RRO, chloroform, benzene, ethylbenzene, tetrachloroethene (PCE), naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and 1-methylnaphthalene. The community drinking water is from surface water bodies and not from groundwater wells.

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:

Prior to installation of the piles along Shore Avenue, sheen had been reported in Kotzebue Sound, downgradient of the site.

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:

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:

Volatile soil contaminants encountered at the site include: 1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene

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 contaminated 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:

Volatile soil contaminants encountered at the site include: 1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene

Note, the FRF Building is on pilings with an open area beneath the building for airflow.

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:

Due to shallow groundwater, workers may be exposed to groundwater during construction activities.

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:

Not applicable

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 - PM₁₀). 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:

Not applicable

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:

Not applicable

4. Other Comments (*Provide other comments as necessary to support the information provided in this form.*)

APPENDIX G

DEC Review Comment Table

Document: draft, 2022 Landfarm Sampling and Groundwater Monitoring Report, Former IHS/BIA Hospital-School Pipeline Release, IHS, November 2022, Tanana Commercial/Environmental Management, LLC JV

File No: 410.38.025

Comment No.	Section/Page	DEC Comment/Recommendation 12/16/2022	Responsible Party Response 01/24/2022 ADEC response: 01/06/2023
1.	3.1, 1 st bullet	<p><i>Headspace samples were not collected from the 2020 landfarm soil cell on a 10-foot by 10-foot grid due to <u>initial readings</u> indicating elevated levels of contamination still present.</i></p> <p>Please clarify what is meant by “initial readings”.</p>	<p>Revised Section 3.1</p> <p>ADEC, 01/06/2023: Response accepted.</p>
2.	3.2	<p><i>Product level measurements were collected for Monitoring Well MW1. Monitoring Well MW6 was suspected to contain ice with potential product on top though no measurable level of product was present.</i></p> <p>Was there an attempt to remove the product in MW1? If so, approximately how much product was removed? DEC notes free product must be removed to the maximum extent practicable, per 18 AAC 75.325(f)(1)(B).</p>	<p>Passive product recovery was put in place. See section 4.2 and photos 6 and 12. Approximate volume of product removed will be calculated after removal of the passive product recovery device in a future field event.</p> <p>ADEC, 01/06/2023: Response accepted.</p>
3.	3.3	<p><i>Based on volume of GAC, maximum concentrations encountered at the site, and amount of water treated to date, the GAC can continue to be used in 2023.</i></p> <p>Please provide GAC breakthrough calculations prior to the next field mobilization, per ADEC’s Field Sampling Guidance (2022).</p>	<p>GAC breakthrough calculations will be provided in the next field sampling work plan prior to mobilization. Updated Section 8.0.</p> <p>ADEC, 01/06/2023: Response accepted.</p>

Comment No.	Section/Page	DEC Comment/Recommendation 12/16/2022	Responsible Party Response 01/24/2022 ADEC response: 01/06/2023
4.	3.4.2	<p><i>Analytical samples were collected in eight of the ten wells.</i></p> <p>Please include this sampling deviation in the Work Plan Variances section.</p> <p>Additionally, the bulleted list seems to indicate MW2 and MW10 may not have been accessible or sampled. Please clarify.</p>	<p>Revised 3.1 bullet three Revised 3.4.2 bullets for MW2 and MW10</p> <p>ADEC, 01/06/2023: Response accepted.</p>
5.	4.2	<p>This section indicates MW6 was dry whereas section 3.2 notes MW6 likely contained ice and was not sampled.</p> <p>Please clarify if MW6 was dry or if MW6 contained ice.</p>	<p>Revised</p> <p>“Dry well” meaning there is no attainable liquid downhole</p> <p>ADEC, 01/06/2023: Response accepted.</p>
6.	4.3	<p><i>On August 15, 2022, MW1 contained 0.03 feet and MW6 was dry, but the PID read 34.6 ppm from the top of the casing.</i></p> <p>Was 34.6 ppm the PID reading for both wells? Please clarify.</p>	<p>Revised Section 4.2</p> <p>ADEC, 01/06/2023: Response accepted.</p>
7.	5.1	<p><i>Results indicate any remaining contamination in soil is below ADEC MTR cleanup levels.</i></p> <p>DEC concurs with this conclusion that the 2019 soils are below ADEC Method Two Table B2 Migration to Groundwater Cleanup levels.</p>	<p>ADEC MTG revised to ADEC Method Two Table B2 MTG</p> <p>ADEC, 01/06/2023: Response accepted with comments. Prior to moving the 2019 soils offsite, an ADEC Transport and Treatment or Disposal of Contaminated Media Approval form must be completed.</p> <p>Updated language in Section 8.0, end of paragraph 6.</p>

Comment No.	Section/Page	DEC Comment/Recommendation 12/16/2022	Responsible Party Response 01/24/2022 ADEC response: 01/06/2023
8.	5.2	<p><i>The source causing the increasing DRO in Well MW9 is unknown.</i></p> <p>Could increasing DRO be related to the additional excavation of contaminated soils in 2021?</p>	<p>The 2021 removal included the removal of soils downgradient from MW9. As a result, this is not likely to be the cause of increasing DRO levels in MW9.</p> <p>Section has been updated with potential sources contributing to the DRO levels.</p> <p>ADEC, 01/06/2023: Response accepted.</p>
9.	6.2	<p><i>Surrogate recovery for 1,2-dichloroethane-d4 (8260D) for MW2, MW5, MW55, Trip Blank, and MB (HBN 1842148) may be biased high.</i></p> <p><i>Surrogate recovery for 2-methylnaphthalene-d10 (8270D SIM) for MW10 and duplicate MW101 does not meet QC criteria.</i></p> <p>DEC requests the analytical results associated with the samples mentioned above be flagged due to quality control issues.</p>	<p>Table 4 has been updated</p> <p>Revised Section 6.2</p> <p>ADEC, 01/06/2023: Response accepted.</p>
10.	6.2	<p><i>The LOQ for 1,2,3-trichloropropane exceeded the ADEC cleanup level.</i></p> <p>For future fieldwork, DEC requests analytical methods be used that have LOQs below ADEC Method Two Table B1/B2 Cleanup Levels.</p>	<p>Updated Section 8.0 to include future low-level VOC analyses.</p> <p>ADEC, 01/06/2023: Response accepted.</p>
11.	6.2, ADEC Checklist for Lab Report 1224980	<p><i>The relative percent difference (RPD) is above the recommended 30% for five detected PAH compounds in MW10 and MW101.</i></p> <p>DEC requests the data results for MW10 and MW101 be flagged due to quality control issues.</p>	<p>PAHs have been flagged in Table 4</p> <p>ADEC, 01/06/2023: Response accepted.</p>

Comment No.	Section/Page	DEC Comment/Recommendation 12/16/2022	Responsible Party Response 01/24/2022 ADEC response: 01/06/2023
12.	8.0	<p><i>We recommend continued sampling for the full VOC suite during future monitoring events and the use of Teflon-lined sampling materials due to the prior presence of chlorinated solvents in the groundwater at the site.</i></p> <p>DEC concurs with the above recommendation. Additionally, DEC requests the use of VOC analysis with LOQs below DEC Table C Groundwater Cleanup Levels to determine presence vs absence of analytes. See comment 11.</p>	<p>Section 8.0 has been revised</p> <p>ADEC, 01/06/2023: Response accepted.</p>
13.	8.0	<p><i>We recommend continuing product monitoring in Well MW1 and MW6, and continued passive product recovery if measurable product continues to be present in the wells.</i></p> <p>DEC concurs with this recommendation. For future product recovery, DEC would be interested in amounts of product recovered to determine if free product is decreasing in the well over time.</p>	<p>Updated Section 8.0</p> <p>ADEC, 01/06/2023: Response accepted.</p>
14.	8.0	<p><i>Soils in the 2019 landfarm cell are now available for reuse.</i></p> <p>DEC agrees that soils in the 2019 cell are below DEC Method Two Table B1/B2 Migration to Groundwater Soil Cleanup Levels. Please coordinate with DEC's Solid Waste Program prior to disposal at a landfill to ensure regulatory compliance. Additionally, post-treated soils may not be used in contact with surface water or in any sensitive environment, per Landfarm Technical Memorandum (2020).</p>	<p>Updated language in Section 8.0</p> <p>ADEC, 01/06/2023: Response accepted with comments. Prior to moving the 2019 soils offsite, an ADEC Transport and Treatment or Disposal of Contaminated Media Approval form must be completed.</p> <p>Updated language in Section 8.0, end of paragraph 6.</p>

Comment No.	Section/Page	DEC Comment/Recommendation 12/16/2022	Responsible Party Response 01/24/2022 ADEC response: 01/06/2023
15.	Figure 2	<p>Please provide a more detailed figure of the landfarm showing:</p> <ol style="list-style-type: none"> 1. Dimensions of grid system used for field screening samples for 2019 and 2020 soils and analytical samples for 2019. 2. Estimated area of sacrificial fill. 3. Dimensions of 2020 soil cell. 	<p>Figure 2 with information from bullets 1 and 3. ADEC, 01/06/2023: Response accepted.</p> <p>In response to bullet 2: Approximately 6 inches of protective/sacrificial fill was placed across the entire landfarm (includes 2019 and 2020 cells) when it was constructed in 2019. See Photo 6 in 2019 report. No changes were made to Figure 2. ADEC, 01/06/2023: Response accepted.</p>
16.	Field Notes, August 15	<p>Field notes indicated MW3 and MW4 are located on school recess grounds. Please confirm these wells are secured. The photos for MW3 and MW4 show well caps but do not show if the well caps have locks on them.</p>	<p>MW4 photo (Photo 9) updated. MW3 photo of locked cap was not taken. This will be noted for the next field effort. (for reference MW3 locked cap looks similar to MW4) ADEC, 01/06/2023: Response accepted.</p>
17.	Appendix F, CSM Graphic Form, Lot 3	<p>Groundwater, Transport Mechanisms</p> <p>DEC notes that while there is a sea wall barrier that is meant to prevent migration of groundwater into Kotzebue Sound, this has not been confirmed or recently sampled. In order to remain conservative, please check the “Flow to Surface Water Body” box under transport mechanisms for groundwater.</p>	<p>Revised ADEC, 01/06/2023: Response accepted.</p>

Comment No.	Section/Page	DEC Comment/Recommendation 12/16/2022	Responsible Party Response 01/24/2022 ADEC response: 01/06/2023
18.	Appendix F, CSM Scoping Form, Lot 3, General Information	<p>Sources</p> <p>DEC notes the former aboveground storage tanks from the former tank farm are documented as possible sources at this site. Please check the ASTs box under sources.</p>	<p>Revised</p> <p>ADEC, 01/06/2023: Response accepted.</p>
19.	Appendix F, CSM Scoping Form, Lot 4	<p>Groundwater, Transport Mechanisms</p> <p>DEC notes that while there is a sea wall barrier that is meant to prevent migration of groundwater into Kotzebue Sound, this has not been confirmed or recently sampled. In order to remain conservative, please check the “Flow to Surface Water Body” box under transport mechanisms for groundwater.</p>	<p>Revised</p> <p>ADEC, 01/06/2023: Response accepted.</p>
20.		-end of table-	