GROUNDWATER AND SURFACE WATER MONITORING REPORT

FORMER YUKON DELTA FISH MARKETING COOPERATIVE TANK FARM

ADEC File No.: 2413.38.011
Hazard ID: 25899

EMMONAK, ALASKA

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ACRONYMS & ABBREVIATIONS

°C ..... degrees Celsius
µg/l ..... micrograms per liter
AAC ..... Alaska Administrative Code
ADEC ..... Alaska Department of Environmental Conservation
AST ..... aboveground storage tank
AWQS ..... Alaska Water Quality Standards
BTEX..... benzene, toluene, ethylbenzene, and xylenes
DRO ..... diesel range organics
GAC ..... granular activated carbon
GRO..... gasoline range organics
HCl ..... hydrochloric acid
IDW ..... investigative derived waste
Kwik'Pak ..... Kwik'Pak Fisheries
mg/L ..... milligrams per liter
ml ..... milliliter
PAH..... polycyclic aromatic hydrocarbons
PVC..... polyvinyl chloride
Rescon..... Rescon Alaska, LLC
RRO ..... residual range organics
TAH..... total aromatic hydrocarbons
TAqH..... total aqueous hydrocarbons
VOC ..... volatile organic compounds
YDFDA..... Yukon Delta Fisheries Development Association

1. INTRODUCTION

Rescon Alaska, LLC (Rescon) has developed this Groundwater and Surface Water Monitoring Report on behalf of Kwik'Pak Fisheries, LLC (Kwik'Pak) to summarize the sampling activities conducted at the former Emmonak Yukon Delta Fisheries Development Association (YDFDA) Tank Farm site in Emmonak, Alaska (Figure 1). Rescon collected groundwater and surface water samples to monitor contaminants previously detected at the property. The site is listed in the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites with File Number 2413.38.011 and Hazard ID 25899.

1.1. Site Description and Background

The village of Emmonak is situated on the north bank of Kwiguk Pass, a channel in the Yukon River Delta system in western Alaska (Figure 1 and 2). The former YDFDA Tank Farm property is located at the southeastern portion of the village along City Office Road to the north and Kwiguk Pass to the south, as shown on Figure 2. One diesel and three gasoline aboveground storage tanks (ASTs) were located on the property. In 2000, a bulk fuel farm assessment was performed to investigate the property for evidence of petroleum releases from the tank farm system. The investigation effort detected the presence of benzene-contaminated soil in vicinity of the southeast corner of the former tank farm location. The benzene contamination was detected in the subsurface soil at 4.5 feet below the ground surface. The extent of the benzene-impacted soil was not defined. In the time since the assessment, the ASTs have all been removed from the site and a new village store building was constructed on the property.

1.2. Project Objective and Scope of Work

The objective of this investigation effort was to continue monitoring contaminants in groundwater between the former tank farm property and Kwiguk Pass and to further monitor the surface water in Kwiguk Pass. This report provides a detailed description of the field activities and sample collection methodologies performed during the investigation effort to accomplish the project objectives.

1.3. Contaminants of Concern

The site contaminants of concern are based on previous investigation results and consist of gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs).

1.4. Regulatory Framework

The regulatory framework for this project has been developed under consideration of the following regulations and guidance documents.

- *Title 18 Alaska Administrative Code (AAC) Chapter 70 (18 AAC 70), ADEC Water Quality Standards* (AWQS) (ADEC, 2022d);
- *18 AAC 75, ADEC Oil and Other Hazardous Substances Pollution Control* (ADEC, 2023);

- *ADEC Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites* (ADEC, 2017);
- ADEC Guidelines for Data Reporting - Technical Memorandum 22-001 (ADEC, 2022b)
- *ADEC Field Sampling Guidance* (ADEC, 2022a); and
- *ADEC Monitoring Well Guidance* (ADEC, 2013).

Analytical groundwater results were compared to ADEC groundwater cleanup levels listed in Table C of 18 AAC 75.345. The surface water samples collected from Kwiguk Pass were compared to ADEC AWQS 18 AAC 70 (ADEC, 2022d) and the ADEC Water Quality Criteria for Toxic and Other Deleterious Organic or Inorganic Substances (ADEC, 2022c). Certain petroleum compounds are not covered in 18 AAC 70 (e.g., GRO, DRO, and RRO). Instead, total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) were calculated using BTEX and PAH results to assess surface water quality.

2. ENVIRONMENTAL INVESTIGATION ACTIVITIES

The following subsections describe the work performed at the site which include groundwater and surface water sample collection. All field activities were performed in accordance with the *ADEC Field Sampling Guidance* (ADEC, 2022) and the ADEC-approved work plan titled *Groundwater / Surface Water Investigation Work Plan – Former Yukon Delta Fish Marketing Cooperative Tank Farm* (Rescon, 2019).

Field notes and Groundwater and Surface Water Sampling Records are provided in Appendix A.

2.1. General Field Activities

Rescon field personnel conducted field activities on July 26 and 27, 2022. All monitoring wells were located and dug out on July 26, 2022, and groundwater and surface water samples were collected on July 27, 2022.

The monitoring wells were buried under approximately 6-inches of gravel and were located using a metal detector. Each monitoring well was dug out using a rock hammer and shovel. Upon opening each monitoring well, it was discovered that the monument casing of each well was tilted and/or frost jacked under the subsurface so that the edge of the monument covered the top of the inner polyvinyl chloride (PVC) casing preventing the wells from being easily opened. It is unclear how the monument casings were damaged. Using a pry bar, the field scientist was able to extract the inner PVC casing of each well away from the smashed monuments so that the wells could be opened and sampled. However, each monitoring well will likely need to be replaced due to the inaccessibility of the inner PVC casings.

2.2. Groundwater Sampling

Groundwater was collected from existing monitoring wells (MW1, MW2 and MW3) that were installed in 2019 (Figure 3). All groundwater samples were collected in accordance with low-flow techniques outlined in the ADEC *Field Sampling Guidance* (ADEC, 2022a). Groundwater was pumped from each monitoring well using a peristaltic pump and dedicated tubing. The tubing intake was positioned within one foot of the top of the groundwater table to ensure the samples were collected from the groundwater most likely to be impacted by the source area petroleum contaminants. Depth to water ranged from 1.83 – 3.20 feet below top of casing and there was limited groundwater volume for sample collection. Due to shallow water columns in the well casings, the water columns purged dry at each well during purging. As a result of the limited water column and poor recharge rate, the field scientist was unable to purge the groundwater prior to sample collection. After each well was purged dry, the scientist attempted to let the wells recharge to approximately 80% of the well volume prior to sampling in accordance with the *Field Sampling Guidance.* However, recharge was too slow at MW-2 and MW-3, and groundwater samples were collected from these wells with a volume less than 80% of the initial volume. Water was collected from MW-1 with approximately 88% of the initial well volume. Initially, sample tubing was placed approximately 0.5 feet below the top of the water but was lowered as the water column reduced during pumping.

Groundwater samples were collected for GRO, DRO, RRO, BTEX and PAH analysis. BTEX and GRO samples were collected into laboratory-provided clean 40 milliliter (ml) VOA vials containing hydrochloric acid (HCl) preservative and secured with septa lids. The sample containers were completely filled to ensure no headspace was present to prevent volatilization. After filling, the containers were immediately capped, turned over and tapped to ensure no air bubbles were present. If air bubbles were observed, the container was opened, filled further, capped and inspected again. This process was repeated until no air bubbles were observed in the container. Care was taken to avoid overfilling the VOAs to ensure HCl acid preservative did not spill out of the containers. Groundwater collected for DRO and RRO analysis was filled into two clean 250 ml amber jars preserved with HCl acid. Samples collected for PAH analysis were collected into two clean 250 ml unpreserved amber glass bottles.

2.3. Surface Water Sampling – Kwiguk Pass

Rescon collected three surface water samples along the north bank of the river from the same sample locations (SW1, SW2 and SW3) as 2019 (Figure 3). As shown on Figure 3, one sample location (SW3) was positioned to the east and up-gradient of the source area for a comparison of background concentrations in the river. Rocky substrate (i.e. rip rap) barrier along the bank of Kwiguk Pass prevented the installation of temporary pore water samplers using the Geoprobe Systems Manual Sampling Kit. As a result, the surface water samples were collected using a peristaltic pump with dedicated tubing at each location.

Surface water samples were collected by drawing the water through dedicated sample tubing using a peristaltic pump. The tubing was suspended approximately 0.5 feet below the surface of the water to prevent intake of bottom sediments or water near the surface. Water was pumped directly into sample containers in accordance with the analytical order and methods detailed above in Section 2.2. Surface water samples were collected for GRO, DRO, RRO, BTEX and PAH analysis.

2.4. Sample Management

A total of four groundwater samples (three primary, and one duplicate sample) and three surface water samples were collected. The samples were labeled and immediately placed into a cooler with sufficient ice to maintain the sample temperatures at 4° ± 2 degrees Celsius (°C). Samples were submitted and analyzed by SGS North America, an ADEC certified laboratory in Anchorage, Alaska.

2.5. Waste Management

Investigative derived waste (IDW) generated during field activities included disposable sample gloves, sampling tubing, paper towels and miscellaneous paper waste. Purge water was processed through a new granular, activated carbon (GAC) filter. However, there was minimal purge water produced during groundwater sampling and the GAC absorbed almost all the purge water and minimal effluent was produced. The effluent was captured in a clean 5-gallon bucket and no sheen or other evidence of contaminant breakthrough was observed, so the effluent was discharged to the ground surface. The spent carbon from the GAC filter was demobilized from

the site and appropriately disposed of with other project impacted waste materials. The remaining IDW, including disposable sample gloves, sampling tubing, paper towels and miscellaneous paper waste was bagged and taped shut and placed in an onsite solid waste receptacle for disposal at the Emmonak Municipal Landfill.

2.6. Deviations from Workplan

A summary of deviations from the original scope of work are provided below.

1. Groundwater and surface water were not analyzed for full list VOCs. The project team inadvertently requested only the analysis of BTEX compounds. The 2019 groundwater and surface water sampling results included results for BTEX and other VOC analytes (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 2-butanone, 4-isopropyltoluene and naphthalene). All analytes were below ADEC cleanup levels, except for BTEX and naphthalene.
2. Water quality field measurements were not collected prior to sampling due to low groundwater volumes and the poor recharge rates at the wells.
3. During the surface water sampling activity, the field scientist dropped her phone in the river and was unable to retrieve it. The phone was also being used as the field camera for the project. As a result, photographs documenting field activities were not able to be included in the report.

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3. RESULTS

Results from the 2022 groundwater and surface water investigation performed at the YDFDA Tank Farm site are presented in this section. Groundwater and surface water analytical results are included in Tables 1 and Table 2, respectively. Calculated TAH and TAqH concentrations for the surface water samples are also presented in Table 2. The 2019 groundwater and surface water samples are also included in Tables 1 and 2 for comparison. The Laboratory Analytical Report is provided in Appendix B.

3.1. Groundwater Sample Results

Groundwater samples were analyzed for GRO, DRO, RRO, BTEX and PAHs. The sample results were compared to ADEC 18 AAC 75 Table C groundwater cleanup levels (ADEC, 2023). Laboratory analysis of groundwater samples detected contaminant concentrations above the ADEC groundwater cleanup levels at monitoring wells MW2 and MW3 as shown in Table 1. Several analytes were detected, but only benzene was reported above the ADEC cleanup level [4.6 micrograms per liter (μg/l)]. Groundwater sample results are summarized below and have also been compared to the 2019 analyte exceedances for trend analysis.

- In 2019, the benzene concentration in MW2 (297 μg/L) exceeded the cleanup level. In 2022, benzene was reported at a lower concentration (88.0 μg/L) but was still above the ADEC cleanup level.
- Both DRO and naphthalene concentrations [1.63 milligrams per liter (mg/L)] and 2.00 μg/L, respectively) in groundwater from MW2 were reported above ADEC cleanup levels in 2019. In 2022, the DRO and naphthalene concentrations (0.645 mg/L and 0.0527 μg/L, respectively) were detected but were reported both below ADEC cleanup levels.
- The 2019 DRO concentration (5.66 mg/L) in MW3, which was above the ADEC cleanup level (1.5 mg/L), reduced to a concentration (0.496 mg/L) that was below the cleanup level in 2022.

All other analyte concentrations for MW2 and MW3, and all analyte concentrations for MW1 were either non-detect or below ADEC cleanup levels. Monitoring well locations are shown on Figure 3 including historical and current analyte concentrations that exceed ADEC cleanup criteria.

3.2. Surface Water Results

The surface water samples were analyzed for GRO, DRO, RRO, BTEX and PAHs and sample results are presented in Table 2. Surface water sample results were compared to the ADEC 18 AAC 70 AWQS (ADEC, 2022d) and the ADEC Water Quality Criteria for Toxic and Other Deleterious Organic or Inorganic Substances (ADEC, 2022c) for fresh water.

The TAH and TAqH calculations are also shown in Table 2 and were compared to AWQS cleanup limits (10 μg/L and 15 μg/L, respectively). TAH is the summation of BTEX concentrations and TAqH is the sum of BTEX and PAH analytes combined. In accordance with the ADEC Technical Memorandum 22-001, Guidelines for Data Reporting, Rescon utilized the laboratory Limit of Quantitation (LOQ) value for any non-detected analytes for the calculation of the respective TAH

and TAqH concentrations (ADEC, 2022b). These results were compared to water quality criteria for Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife, as stated in the Water Quality Standards for Designated Uses table in the ADEC Water Quality Standards document (ADEC, 2022d). The surf ace water analytical results are summarized below.

- In 2022, no individual PAH compounds were reported above the respective laboratory detection limits in any of the samples. In 2019, 2-methylnaphthalene was not detected but in 2022 estimated concentrations were reported for 22-EMNK-SW1 and 22-EMNK-SW3 (0.0161 J μg/L and 0.0146 J μg/L, respectively).
- Concentrations of RRO were detected at SW1, SW2 and SW3 (0.418 J mg/L, 0.388 J mg/L and 0.340 J mg/L, respectively).
- In 2019, DRO was detected at all surface water locations. In 2022, DRO was not reported above the laboratory detection limit in any of the samples.
- In 2022, no BTEX compounds were reported above the respective laboratory detection limits at any of the samples. In 2019, benzene was reported for surface water location SW1 and concentrations of toluene was reported for all surface water locations.
- The highest calculated TAH concentration in the surface water samples was 3.18 μg/L, which was below the AWQS of 10 μg/L.
- The highest calculated TAqH concentration in the surface water samples was 3.62 μg/L, which also was below the respective AWQS of 15 μg/L.

4. QUALITY ASSURANCE REVIEW

Rescon conducted a quality assurance review of the analytical results. There were no sample-receiving or quality control anomalies that affected data quality for this project. Overall precision, accuracy, sensitivity, representativeness, comparability, and completeness of the dataset were deemed acceptable, and the data are usable for the purposes of this project. See the ADEC Laboratory Data Review Checklist in Appendix C for additional information.

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5. CONCLUSIONS AND RECOMMENDATIONS

Rescon collected groundwater and surface water samples to monitor contaminants previously detected at the property. Field efforts consisted of groundwater and surface water sampling. The outer casing of each monitoring well was damaged and access to the inner PVC casings was difficult. Each inner PVC had to be pried from the edge of the outer casing so that is could be opened and sampled. Due to the condition of each monitoring well it is recommended that new monitoring wells be installed at the site for further groundwater monitoring.

A summary of the analytical findings is presented below.

- Analysis of groundwater samples collected on-site reported that the groundwater is impacted at the site. In 2019, DRO was detected in groundwater from two of the monitoring wells (MW2 and MW3) at levels exceeding ADEC groundwater cleanup levels. However, in 2020 DRO concentrations in all monitoring wells were below cleanup levels.
- Benzene concentrations on MW2 was the only analyte detected in 2022 that was above ADEC cleanup levels.
- Surface water analytical results did not detect contaminant concentrations above the respective AWQS at any of the three sample locations.
- Groundwater contaminant trends appear to be declining. However, due to the limited data points, it is not fully conclusive.

Follow-on groundwater sampling is recommended for 2024. Further monitoring of the groundwater is necessary to better assess the degree and stability of the groundwater contamination and to assess the attenuation potential at the site. A goal of future monitoring is to gather enough data to conduct a statistical analysis such as the Mann-Kendall (MK) test, to identify contaminant trends in the groundwater. The MK test is a non-parametric test, which means it does not assume a distribution and is resistant to the influence of outliers. The test compares later-measured values to each earlier-measured value and could provide a good assessment on the contaminant level trends and attenuation potential at the site. A minimum of four sampling events are required to perform the MK test.

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6. REFERENCES

Alaska Department of Environmental Conservation (ADEC) 2013. *Monitoring Well Guidance*. September.

ADEC. 2017. *Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites*. March.

ADEC. 2022a. *Field Sampling Guidance*. January.

ADEC. 2022b. *Guidelines for Data Reporting - Technical Memorandum 22-001*. August.

ADEC. 2022c. Water Quality Criteria for Toxic and Other Deleterious Organic or Inorganic Substances. September.

ADEC. 2022d. *Title 18 Alaska Administrative Code (AAC) Chapter 70, Water Quality Standards*. November.

ADEC. 2023.*18 AAC 75. Oil and Other Hazardous Substances Pollution Control*. October.

Rescon Alaska, LLC (Rescon), 2019. *Groundwater / Surface Water Investigation Work Plan, Former Yukon Delta Fish Marketing Cooperative Tank Farm, Emmonak, Alaska*. March.

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FIGURES

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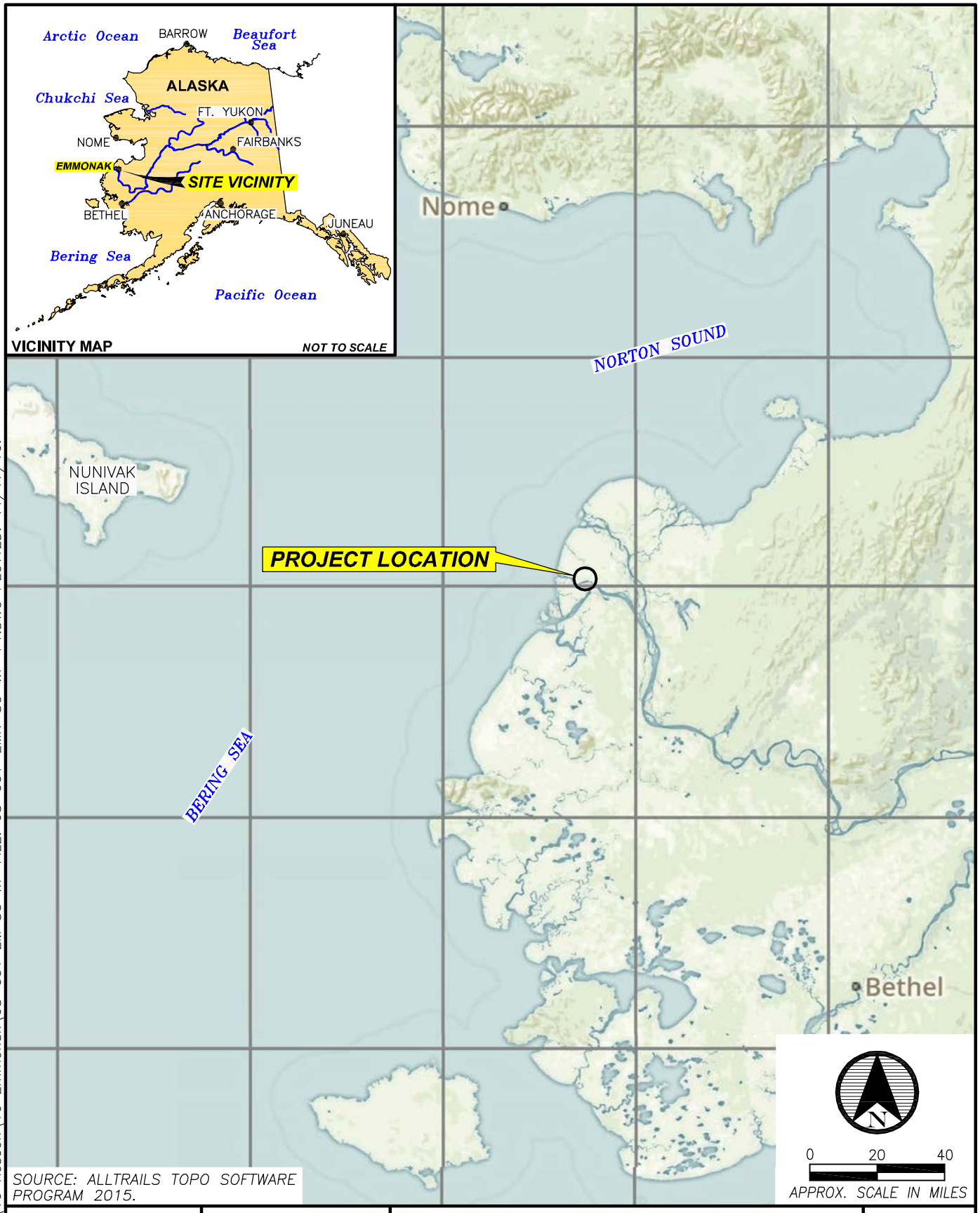

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DATE: July 2020
REV.: –
CHKD: Z.C.K.
DRAWN: C.E.H.
PROJ. No.: 68-002

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SITE LOCATION MAP

GROUNDWATER / SURFACE WATER INVESTIGATION REPORT

EMMONAK, ALASKA

FIGURE

1

SOURCE: IMAGE FROM GOOGLE EARTH PROFESSIONAL DATED 6/5/2010.

DATE: July 2020
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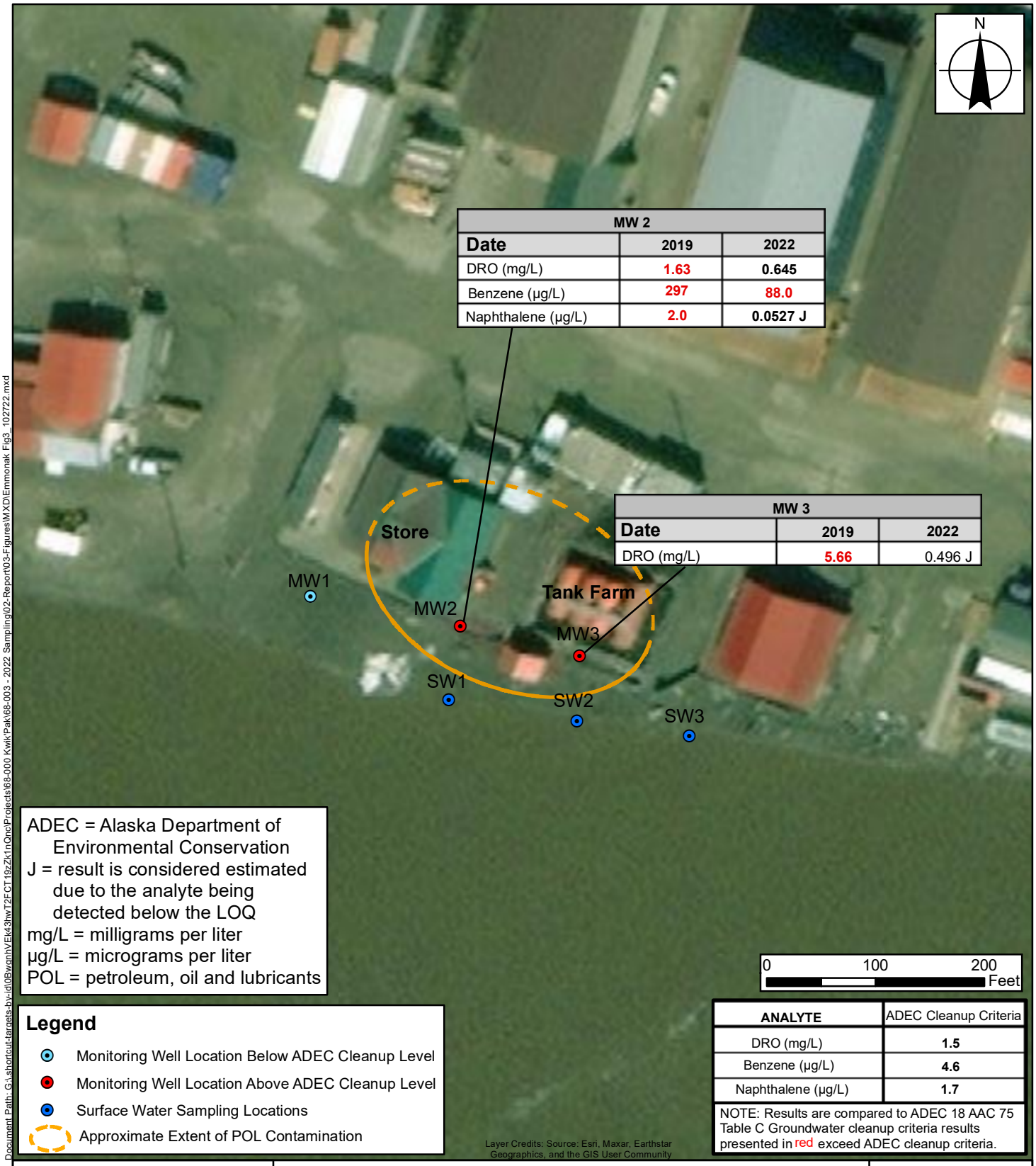
SITE PLAN

GROUNDWATER / SURFACE WATER INVESTIGATION REPORT

EMMONAK, ALASKA

FIGURE

2



ADEC = Alaska Department of Environmental Conservation
J = result is considered estimated due to the analyte being detected below the LOQ
mg/L = milligrams per liter
µg/L = micrograms per liter
POL = petroleum, oil and lubricants

Legend

- Monitoring Well Location Below ADEC Cleanup Level
- Monitoring Well Location Above ADEC Cleanup Level
- Surface Water Sampling Locations
- Approximate Extent of POL Contamination

ANALYTE	ADEC Cleanup Criteria
DRO (mg/L)	1.5
Benzene (µg/L)	4.6
Naphthalene (µg/L)	1.7

NOTE: Results are compared to ADEC 18 AAC 75 Table C Groundwater cleanup criteria results presented in red exceed ADEC cleanup criteria.

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CURRENT AND HISTORICAL SAMPLE RESULTS

GROUNDWATER / SURFACE WATER INVESTIGATION REPORT
EMMONAK, ALASKA

FIGURE

3

TABLES

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Table 1: Groundwater Investigation Results
Yukon Delta Fisheries Association Tank Farm, Emmonak, Alaska

Monitoring Well		MW1		MW2			MW3			Trip Blank	
Sample Description		Primary	Primary	Primary	Primary	Field Duplicate	Primary	Field Duplicate	Primary		
Sample ID:		19-EMMON-04-GW	22-EMNK-MW1	19-EMMON-05-GW	22-EMNK-MW2	22-EMNK-MW4	19-EMMON-06-GW	19-EMMON-08-GW	22-EMNK-MW3		
Year		2019	2022	2019	2022	2022	2019	2019	2022		
Date and Time:		8/20/19 20:15	7/27/22 9:30	8/21//2019 11:55	7/27/22 9:50	7/27/22 9:55	8/21/19 11:00	8/21/19 11:10	7/27/22 10:25	8/20/19 15:30	7/27/22 8:00
Analyte	**ADEC Cleanup Criteria**	**PAH Results in ug/L**									
1-Methylnaphthalene	**11**	NA	0.0261 U	**0.884**	0.0261 U	**0.0201 J**	0.0245 U	NA	0.0245 U	NA	NA
2-Methylnaphthalene	**36**	NA	0.0261 U	**0.957**	0.0261 U	**0.0211 J**	0.0245 U	NA	0.0245 U	NA	NA
Acenaphthene	**530**	NA	0.0261 U	**0.145**	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Acenaphthylene	**260**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Anthracene	**43**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Benzo(a)Anthracene	**0.3**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Benzo[a]pyrene	**0.25**	NA	0.0104 U	0.0108 U	0.0104 U	0.00980 U	0.00980 U	NA	0.00980 U	NA	NA
Benzo[b]Fluoranthene	**2.5**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Benzo[g,h,i]perylene	**0.26**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Benzo[k]fluoranthene	**0.8**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Chrysene	**2.0**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Dibenzo[a,h]anthracene	**0.25**	NA	0.0104 U	0.0108 U	0.0104 U	0.00980 U	0.00980 U	NA	0.00980 U	NA	NA
Fluoranthene	**260**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Fluorene	**290**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Indeno[1,2,3-c,d] pyrene	**0.19**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Naphthalene	**1.7**	NA	0.0520 U	**1.03**	**0.0357 J**	**0.0527 J**	**0.103**	NA	0.0490 U	NA	NA
Phenanthrene	**170**	NA	0.0520 U	0.0270 U	0.0520 U	0.0490 U	0.0245 U	NA	0.0490 U	NA	NA
Pyrene	**120**	NA	0.0261 U	0.0270 U	0.0261 U	0.0245 U	0.0245 U	NA	0.0245 U	NA	NA
Analyte	**ADEC Cleanup Criteria**	**POL Results in mg/L**									
Gasoline Range Organics	**2.2**	0.0500 U	0.0500 U	**0.493**	**0.295**	**0.278**	**0.0580 J**	**0.0559 J**	0.0500 U	0.0500 U	0.0500 U
Diesel Range Organics	**1.5**	**0.792**	**0.327 J**	**1.63**	**0.598**	**0.645**	**5.66**	**4.29**	**0.496 J**	--	NA
Residual Range Organics	**1.1**	--	0.56	--	**0.547**	**0.59**	--	--	**0.571**	--	NA
Analyte	**ADEC Cleanup Criteria**	**VOC Results in ug/L**									
1,1,1,2-Tetrachloroethane	**5.7**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
1,1,1-Trichloroethane	**8000**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,1,2,2-Tetrachloroethane	**0.76**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
1,1,2-Trichloroethane	**0.41**	0.200 U	NA	0.200 U	NA	NA	0.200 U	0.200 U	NA	0.200 U	NA
1,1-Dichloroethane	**28**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,1-Dichloroethene	**280**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,1-Dichloropropene	**N/A**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,2,3-Trichlorobenzene	**7**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,2,3-Trichloropropane	**0.0075**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,2,4-Trichlorobenzene	**4**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,2,4-Trimethylbenzene	**56**	0.500 U	NA	**3.79**	NA	NA	0.800 J	0.850 J	NA	0.500 U	NA
1,2-Dibromo-3-chloropropane	**N/A**	5.00 U	NA	5.00 U	NA	NA	5.00 U	5.00 U	NA	5.00 U	NA
1,2-Dibromoethane	**0.075**	0.0375 U	NA	0.0375 U	NA	NA	0.0375 U	0.0375 U	NA	0.0375 U	NA
1,2-Dichlorobenzene	**300**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,2-Dichloroethane	**1.7**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
1,2-Dichloropropane	**8.2**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,3,5-Trimethylbenzene	**60**	0.500 U	NA	**1.68**	NA	NA	**0.420 J**	**0.450 J**	NA	0.500 U	NA
1,3-Dichlorobenzene	**300**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
1,3-Dichloropropane	**N/A**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
1,4-Dichlorobenzene	**4.8**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
2,2-Dichloropropane	**N/A**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
2-Butanone (MEK)	**5600**	**49.2**	NA	**81.0**	NA	NA	**87.1**	**87.1**	NA	5.00 U	NA
2-Chlorotoluene	**N/A**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
2-Hexanone	**38**	5.00 U	NA	5.00 U	NA	NA	5.00 U	5.00 U	NA	5.00 U	NA
4-Chlorotoluene	**N/A**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
4-Isopropyltoluene	**N/A**	0.500 U	NA	**1.29**	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
4-Methyl-2-pentanone (MIBK)	**6300**	5.00 U	NA	5.00 U	NA	NA	5.00 U	5.00 U	NA	5.00 U	NA
Benzene	**4.6**	**0.180 J**	0.200 U	**297**	**84.1**	**88.0**	**3.42**	**3.39**	**2.06**	0.200 U	0.200 U
Bromobenzene	**62**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Bromochloromethane	**N/A**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Bromodichloromethane	**1.3**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
Bromoform	**33**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Bromomethane	**7.5**	2.50 U	NA	2.50 U	NA	NA	2.50 U	2.50 U	NA	2.50 U	NA
Carbon disulfide	**810**	5.00 U	NA	5.00 U	NA	NA	5.00 U	5.00 U	NA	5.00 U	NA
Carbon tetrachloride	**4.6**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Chlorobenzene	**78**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
Chloroethane	**21000**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Chloroform	**2.2**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Chloromethane	**190**	0.500 U	NA	**0.330 J**	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Dibromochloromethane	**8.7**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
Dibromomethane	**8.3**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Dichlorodifluoromethane	**200**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Ethylbenzene	**15**	0.500 U	0.500 U	**0.550 J**	0.500 U	0.500 U	**0.830 J**	**0.730 J**	0.500 U	0.500 U	0.0500 U
Freon-113	**10000**	5.00 U	NA	5.00 U	NA	NA	5.00 U	5.00 U	NA	5.00 U	NA
Hexachlorobutadiene	**1.4**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Isopropylbenzene (Cumene)	**450**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Methyl-t-butyl ether	**140**	5.00 U	NA	5.00 U	NA	NA	5.00 U	5.00 U	NA	5.00 U	NA
Methylene chloride	**110**	2.50 U	NA	2.50 U	NA	NA	2.50 U	2.50 U	NA	2.50 U	NA
Naphthalene	**1.7**	0.500 U	NA	**2.00**	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
P & M -Xylene	**N/A**	**1.23 J**	1.00 U	**0.940 J**	1.00 U	1.00 U	**1.64 J**	**1.49 J**	1.00 U	1.00 U	1.00 U
Styrene	**1200**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Tetrachloroethene	**41**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Toluene	**1100**	**0.530 J**	0.500 U	**0.750 J**	**1.12**	**1.19**	**0.510 J**	**0.440 J**	0.500 U	0.500 U	0.0500 U
Trichloroethene	**2.8**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Trichlorofluoromethane	**5200**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
Vinyl acetate	**410**	5.00 U	NA	5.00 U	NA	NA	5.00 U	5.00 U	NA	5.00 U	NA
Vinyl chloride	**0.19**	0.0750 U	NA	0.0750 U	NA	NA	0.0750 U	0.0750 U	NA	0.0750 U	NA
Xylenes (total)	**190**	**1.61 J**	1.50 U	**1.57 J**	1.50 U	1.50 U	**2.59 J**	**2.37 J**	1.50 U	1.50 U	1.50 U
cis-1,2-Dichloroethene	**36**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
cis-1,3-Dichloropropene	**N/A**	0.250 U	NA	0.250 U	NA	NA	0.250 U	0.250 U	NA	0.250 U	NA
n-Butylbenzene	**1000**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
n-Propylbenzene	**660**	0.500 U	NA	**0.470 J**	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
o-Xylene	**N/A**	**0.380 J**	0.500 U	**0.630 J**	0.500 U	0.500 U	**0.950 J**	**0.880 J**	0.500 U	0.500 U	0.0500 U
sec-Butylbenzene	**2000**	0.500 U	NA	**0.440 J**	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
tert-Butylbenzene	**690**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
trans-1,2-Dichloroethene	**360**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA
trans-1,3-Dichloropropene	**N/A**	0.500 U	NA	0.500 U	NA	NA	0.500 U	0.500 U	NA	0.500 U	NA

Notes:

Pink columns indicated 2022 sample results

µg/L = micrograms per liter

ADEC = Alaska Department of Environmental Conservation

bold = detected analyte above the limit of quantitation (LOQ)

red bold = detected analyte exceeds ADEC clean up level

red = analyte was not detected but the LOQ exceeds the ADEC cleanup level

mg/L = miiligrams per liter

NA = not applicable

PAH = polycyclic aromatic hydrocarbons

POL = petroleum, oil and lubricants

VOC = volatile organic compounds

U = analyte was not detected Analyte was not detected above the LOQ

J = result is considered estimated due to the analyte being detected below the LOQ

Table 2: Surface Water Investigation Results
Yukon Delta Fisheries Development Association Tank Farm, Emmonak, Alaska

Location:		SW1		SW2			SW3		Trip Blank	
Sample Description:		Primary	Primary	Primary	Field Duplicate	Primary	Primary	Primary		
Sample ID:		19-EMMON-01-SW	22-EMNK-SW1	19-EMMON-02-SW	19-EMMON-07-SW	22-EMNK-SW2	19-EMMON-03-SW	22-EMNK-SW3		
Year		2019	2022	2019	2019	2022	2019	2022	2019	2022
Date:		8/20/19 15:30	7/27/22 8:45	8/20/19 16:15	8/20/19 16:25	7/27/22 10:45	8/20/19 17:10	44769.44792	8/20/19 15:30	7/27/22 8:00
Analyte	**ADEC Criteria**	**POL Results in mg/L**								
Gasoline Range Organics	**NA**	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Diesel Range Organics	**NA**	**0.255 J**	0.313 U	**0.258 J**	**0.417 J**	0.306 U	**0.694**	0.306 U	NA	NA
Residual Range Organics	**NA**	NA	**0.418 J**	NA	NA	**0.388 J**	NA	**0.340 J**	NA	NA
Analyte	**ADEC Criteria**	**VOC Results in ug/L**								
1,1,1,2-Tetrachloroethane	**NA**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
1,1,1-Trichloroethane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,1,2,2-Tetrachloroethane	**NA**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
1,1,2-Trichloroethane	**NA**	0.200 U	NA	0.200 U	0.200 U	NA	0.200 U	NA	0.200 U	NA
1,1-Dichloroethane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,1-Dichloroethene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,1-Dichloropropene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,2,3-Trichlorobenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,2,3-Trichloropropane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,2,4-Trichlorobenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,2,4-Trimethylbenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,2-Dibromo-3-chloropropane	**NA**	5.00 U	NA	5.00 U	5.00 U	NA	5.00 U	NA	5.00 U	NA
1,2-Dibromoethane	**NA**	0.0375 U	NA	0.0375 U	0.0375 U	NA	0.0375 U	NA	0.0375 U	NA
1,2-Dichlorobenzene	**2700**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,2-Dichloroethane	**5**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
1,2-Dichloropropane	**5**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,3,5-Trimethylbenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,3-Dichlorobenzene	**400**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
1,3-Dichloropropane	**10**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
1,4-Dichlorobenzene	**75**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
2,2-Dichloropropane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
2-Butanone (MEK)	**NA**	5.00 U	NA	5.00 U	5.00 U	NA	5.00 U	NA	5.00 U	NA
2-Chlorotoluene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
2-Hexanone	**NA**	5.00 U	NA	5.00 U	5.00 U	NA	5.00 U	NA	5.00 U	NA
4-Chlorotoluene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
4-Isopropyltoluene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
4-Methyl-2-pentanone (MIBK)	**NA**	5.00 U	NA	5.00 U	5.00 U	NA	5.00 U	NA	5.00 U	NA
Benzene	**5**	**0.150 J**	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Bromobenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Bromochloromethane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Bromodichloromethane	**NA**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
Bromoform	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Bromomethane	**NA**	2.50 U	NA	2.50 U	2.50 U	NA	2.50 U	NA	2.50 U	NA
Carbon disulfide	**NA**	5.00 U	NA	5.00 U	5.00 U	NA	5.00 U	NA	5.00 U	NA
Carbon tetrachloride	**5**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Chlorobenzene	**680**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
Chloroethane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Chloroform	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.320 J	NA	0.500 U	NA
Chloromethane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Dibromochloromethane	**NA**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
Dibromomethane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Dichlorodifluoromethane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Ethylbenzene	**700**	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0500 U
Freon-113	**NA**	5.00 U	NA	5.00 U	5.00 U	NA	5.00 U	NA	5.00 U	NA
Hexachlorobutadiene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Isopropylbenzene (Cumene)	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Methyl-t-butyl ether	**NA**	5.00 U	NA	5.00 U	5.00 U	NA	5.00 U	NA	5.00 U	NA
Methylene chloride	**NA**	2.50 U	NA	2.50 U	2.50 U	NA	2.50 U	NA	2.50 U	NA
Naphthalene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
P & M -Xylene	**NA**	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Styrene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Tetrachloroethene	**5**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Toluene	**1000**	**0.460 J**	0.500 U	**0.480 J**	**0.400 J**	0.500 U	**0.980 J**	0.500 U	0.500 U	0.0500 U
Trichloroethene	**5**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Trichlorofluoromethane	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Vinyl acetate	**NA**	5.00 U	NA	5.00 U	5.00 U	NA	5.00 U	NA	5.00 U	NA
Vinyl chloride	**2**	0.0750 U	NA	0.0750 U	0.0750 U	NA	0.0750 U	NA	0.0750 U	NA
Xylenes (total)	**10,000**	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U
cis-1,2-Dichloroethene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
cis-1,3-Dichloropropene	**NA**	0.250 U	NA	0.250 U	0.250 U	NA	0.250 U	NA	0.250 U	NA
n-Butylbenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
n-Propylbenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
o-Xylene	**NA**	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0500 U
sec-Butylbenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
tert-Butylbenzene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
trans-1,2-Dichloroethene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
trans-1,3-Dichloropropene	**NA**	0.500 U	NA	0.500 U	0.500 U	NA	0.500 U	NA	0.500 U	NA
Analyte	**ADEC Criteria**	**TAH Calculated Results in ug/L**								
Benzene	**5**	**0.150 J**	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Toluene	**1000**	**0.460 J**	0.500 U	**0.480 J**	**0.400 J**	0.500 U	**0.980 J**	0.500 U	0.500 U	0.0500 U
Ethylbenzene	**700**	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0500 U
Xylenes (total)	**10,000**	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U
Total Aromatic Hydrocarbons	**10**	2.61	2.7	2.68	2.6	2.7	3.18	2.7	2.7	2.7
Analyte	**ADEC Criteria**	**PAH Results in ug/L**								
1-Methylnaphthalene	**NA**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
2-Methylnaphthalene	**NA**	0.0245 U	**0.0161 J**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	**0.0146 J**	NA	NA
Acenaphthene	**1200**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Acenaphthylene	**NA**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Anthracene	**9600**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Benzo(a)Anthracene	**NA**	0.0245 U+B6	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Benzo[a]pyrene	**0.2**	0.00980 U	0.00980 U	0.00980 U	0.00980 U	0.00980 U	0.00980 U	0.00960 U	NA	NA
Benzo[b]Fluoranthene	**NA**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Benzo[g,h,i]perylene	**NA**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Benzo[k]fluoranthene	**NA**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Chrysene	**NA**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Dibenzo[a,h]anthracene	**NA**	0.00980 U	0.00980 U	0.00980 U	0.00980 U	0.00980 U	0.00980 U	0.00960 U	NA	NA
Fluoranthene	**300**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Fluorene	**1300**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Indeno[1,2,3-c,d] pyrene	**NA**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Naphthalene	**NA**	0.0490 U	0.0490 U	0.0490 U	0.0490 U	0.0490 U	0.0490 U	0.0481 U	NA	NA
Phenanthrene	**NA**	0.0245 U	0.0490 U	0.0245 U	0.0245 U	0.0490 U	0.0245 U	0.0481 U	NA	NA
Pyrene	**960**	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	0.0240 U	NA	NA
Analyte	**ADEC Criteria**	**TAqH Calculated Results in ug/L**								
Total Aqueous Hydrocarbons	**15**	3.05	3.15	3.12	3.04	3.16	3.62	3.14	NA	NA

Notes:

Pink columns indicated 2022 sample results

µg/L = micrograms per liter

ADEC = Alaska Department of Environmental Conservation

bold = detected analyte above the limit of quantitation (LOQ)

red bold = detected analyte exceeds ADEC clean up level

red = analyte was not detected but the LOQ exceeds the ADEC cleanup level

mg/L = miiligrams per liter

NA = not applicable

PAH = polycyclic aromatic hydrocarbons

POL = petroleum, oil and lubricants

VOC = volatile organic compounds

U = analyte was not detected above the LOQ

J = result is considered estimated due to the analyte being detected below the LOQ

APPENDIX A

Field Notes and Sample Data Sheets

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EMMONAK

Aug. 2019, July 2022

MADE IN TACOMA
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Rite in the Rain
— DEFYING MOTHER NATURE —

Name Rescon Alaska
8361 Petersberg St.
Address Anchorage AK 99507
* IF FOUND
PLEASE RETURN *

Phone

Email

Projects KWIK PAK
Emmonak, Alaska

MADE IN USA RITE GREEN Archival
RiteintheRain.com

CONTENTS

PAGE	REFERENCE	DATE

19 Aug 2019
55° F
OVERCAST
LIGHT TRAFFIC

KWIK PAK / EMMONAK, AK
N. BOSCH (RESCON)

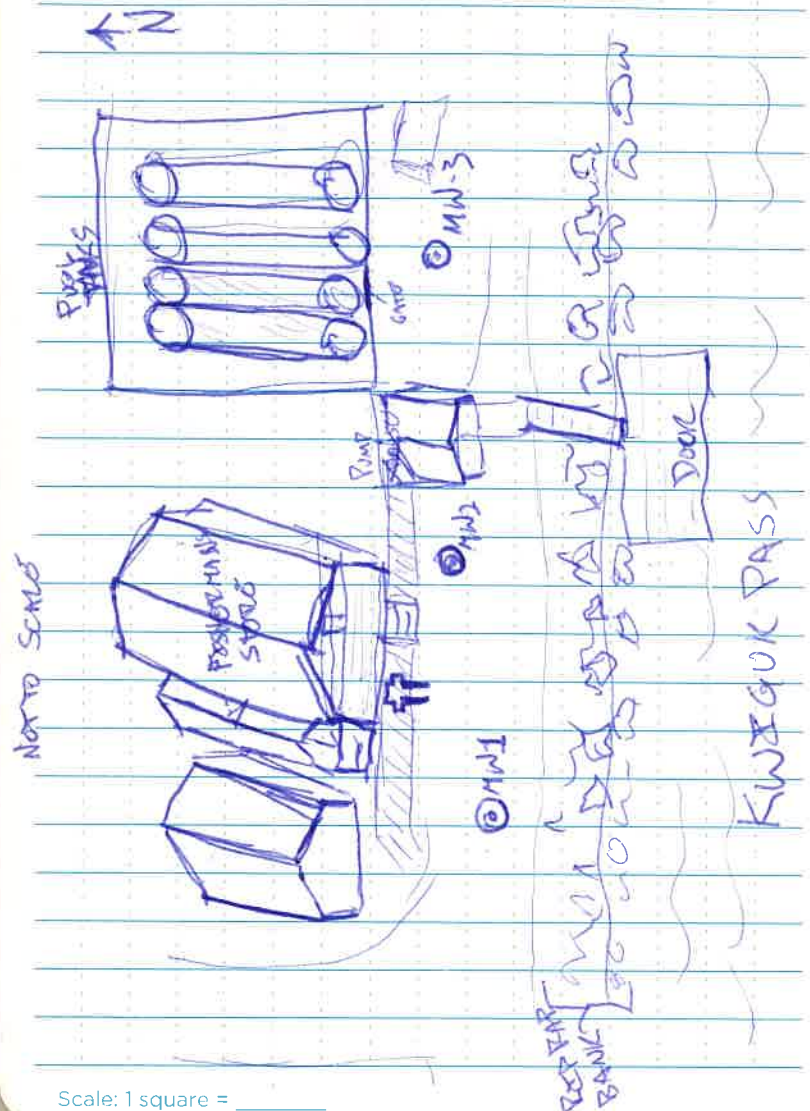
1545 ARRIVE @ EMMONAK,
MEET D. DONEGAN (KWIK PAK)
1615 CHECK IN KWIK PAK
AND SITE VISIT W/ D. DONEGAN
INVENTORY & ORGANIZE GOAT
1730 INITIATE WELL EXCAVATIONS
WITH KWIK PAK OPERATOR
1815 EXCAVATED TO 6.35 FT bgs
@ MW3
1900 EXCAVATED TO 6.40 FT bgs
@ MW2
2000 EXCAVATED TO 6.50 FT bgs
@ ~~MW3~~ MW1

- EXCAVATIONS DUG TO MAXIMUM DEPTH EXCAVATOR COULD ACHIEVE ~6.5 FT bgs.
- EXCAVATED MATERIAL SILTY FINES DAMP AT ~2.5-3 FT bgs.

Scale: 1 square = _____

Rite in the Rain

19 AUG 2019
55° F KWIKPAK / EMMONAK, AK
OVERCAST N. BOSCH (TESCO)



Scale: 1 square = _____

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Scale: 1 square = _____

20 AUG 2019
60°F CLEAR
SUNNY KWIKPAK/EMMONAK
N. BOSCH (ROSCON)

1130 WELL COORDINATES RECORDED ON GARMIN GPS AS:

EMMO MW1: 62° 46.5055' N
164° 31.302 W
ELEV 10 FT

EMMO MW2: 62° 46.5040' N
164° 31.2783' W
ELEV 14 FT

EMMO MW3:
62° 46.5000 N
164° 31.2599' W
ELEV 10 FT

CALIBRATE YSI #2

SOLUTION	~~INITIAL~~	FINAL	IN RANGE
PH 7.0	6.97	7.00	Y
PH 4.0	4.08	4.01	Y
PH 10.01	10.04	10.02	Y
COND 1413 µS/cm	1.445	1.412	Y
DO %	100.3	100.2	Y

Scale: 1 square = _____

20 AUG 2019
60°F CLEAR KWIKPAK/EMMONAK
SUNNY N. BOSCH (ROSCON)

1230 ALL WELLS STILL DRY
CHECKED WITH INTERFACE PROBE
1330 PREPARE FOR SURFACE WATER SAMPLING.

1530 SURFACE WATER SAMPLES

SAMPLE COLLECTED	TIME	LOCATION
19-EMMON-01-SW	15:30	SW1
19-EMMON-02-SW	15:30	SW1
19-EMMON-03-SW	15:30	SW1
19-EMMON-04-SW	15:30	SW1
19-EMMON-05-SW	16:15	SW2
19-EMMON-06-SW	16:15	SW2
19-EMMON-07-SW	16:15	SW2
19-EMMON-08-SW	16:15	SW2
19-EMMON-24-SW	16:25	SW2/DUP
19-EMMON-25-SW	16:25	SW2/DUP
19-EMMON-26-SW	16:25	SW2/DUP
19-EMMON-27-SW	16:25	SW2/DUP

Scale: 1 square = _____

Rite in the Rain

20 AUG 2019
60°F CLOUDY
SUNNY

KWIKCHEM/EMMONAK
N. JESSUP (TESCOM)

SAMPLE	TIME	LOCATION
~~14-EMMON-08-SW~~ (NB)	~~17:10~~	
14-EMMON-09-SW	17:10	SW3
14-EMMON-10-SW	17:10	SW3
14-EMMON-11-SW	17:10	SW3
14-EMMON-12-SW	17:10	SW3

Scale: 1 square = _____

20 AUG 2019
60°F
SUNNY
LIGHT BREEZE

KWIKCHEM/EMMONAK
N JESSUP (TESCOM)

1900 WATER DETECTED IN MW #1 AT DEPTH 5.72 FT
TOTAL WELL DEPTH 6.42 FT

1915 MW2 DRY
TOTAL WELL DEPTH 6.07 FT

1920 MW3 DRY
TOTAL WELL DEPTH 5.98 FT

20:15 SAMPLE MW1

SAMPLE NAME	TIME	LOCATION
14-EMMON-13-GW	20:15	MW1
14-EMMON-14-GW	20:15	MW1
14-EMMON-15-GW	20:15	MW1

2030 MW1 DRAWN DRY
UNABLE TO COLLECT SECOND PAIR OF 250ml (NO HCl) BOTTLES

Scale: 1 square = _____

Rite in the Rain

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Scale: 1 square = _____

21 AUGUST 2019
50°F CLEAR
SUNNY
LIGHT BREEZE FROM WEST

KWIK PAK / GIMMONAK
N BOSCH - TRESCON

0800 COLLECT AND STAGE EQUIPMENT FOR GW SAMPLING
0830 TOUCH BASE W/ P. DONEGAN (KWIK PAK) RE: THIS DAYS SAMPLING PLAN
0900 MW2
DEPTH TO WATER 5.42 ft
TOTAL WELL DEPTH 6.07 ft

SAMPLE MW2

SAMPLE ID	TIME	LOCATION
19-GIMMON-16-GW	11.55	MW2
19-GIMMON-17-GW	11.55	MW2
19-GIMMON-18-GW	11.55	MW2
19-GIMMON-19-GW	11.55	MW2

Scale: 1 square = _____

Rite in the Rain.

21 AUG 2019
55°F CLOAR
SUNNY, LIGHT BREEZE
FROM WEST

KWIK PAK/EMMONAK
N. BOSCH (CROSCON)

10:30 MW3 ~~DEPTH~~ TO WATER
5.14 FT

TOTAL WELL DEPTH
5.98 FT

SAMPLE ID	TIME	LOCATIO
19-EMMON-20-GW	11:00	MW3
19-EMMON-21GW	11:00	MW3
19-EMMON-22GW	11:00	MW3
19-EMMON-23-GW	11:00	MW3
DUPES		
19-EMMON-29-GW	11:10	MW3
19-EMMON-29-GW	11:10	MW3

11:20 MW3 PUMPED DRY
INSUFFICIENT RECHARGE
TO CONTINUE SAMPLING.

Scale: 1 square = _____

July 26, 2022
M Leiver WX: Overcast ~55°F

0845 - Arrive @ ANC Airport
1045 - Depart for Bethel
1208 - Arrive in Bethel & transfer Gear to Grant for flight to Emmonak
1600 - Arrive in Emmonak (plane was delayed). Crystal w/ Kwik Pak shuttles us to the site & orientates me w/ area.
1700 - Begin searching for MWs w/ Schonstedt.
1830 - All wells have been dug out to opened, however MW-2 & MW-3 were damaged & outer casings have tilted, preventing the lids on PVC from opening
1930 - Attempted to open PVC lid of MW-1 easily; however it is air locked on, will ask for help tomorrow
2000 - End of day

Scale: 1 square = _____

Rite in the Rain

July 27, 2022 M. Leiver
WX: Overcast ~55°F

0700 - Arrive @ site office trailer to prep gear/equip. for sampling. Worked w/ Kwikpak staff Sam + Gordon to get all MW's open. Wells MW-2 & MW-3 were opened by prying the inner PVC away from outer casing edged + popped open w/ the edge of a metal tool
- collected well depths + water level.

Time		DTW	DTB
850	MW-1	3.02	6.41
852	MW-2	2.29	6.11
854	MW-3	1.83	5.94

~~0845~~
~~0847~~ - Collect SW sample @ the same location previously sampled for SW-1
- see SW Form

0900 - Begin set up @ MW-1
Based on previous info for all wells pumping

Scale: 1 square = _____

7/27/22

- dry → all GW samples will be collected @ grab samples with no purging or collection of WQ parameters. There was sufficient water in each well but recharge was still very slow + water levels were drawn down in each well exceeding the low-flow threshold of 0.30 ft.

Sample information:
All sampled for GRO/BTEX/DRO-RRO/PAH

TIME	WELL	SAMPLE ID
~~930~~	MW-1	22-EMNK-MW1
950	MW-2	22-EMNK-MW2
955	↓	22-EMNK-MW4 (DUP)
1025	MW-3	22-EMNK-MW3

1030 - Proceed to collect the 2 remaining SW samples in the same location as in 2019.

Scale: 1 square = _____

Rite in the Rain

7/27/22 M. Leirer

~~SW locate~~

Time	SW ID	Sample ID
0845	SW-1	22-EMNK-SW1
1045	SW-2	22-EMNK-SW2
1100	SW-3	22-EMNK-SW3
		4 (MS/D)

HC

- No sheen or odor was observed at any SW location. Water was very turbid + contained sediment.

11:30 - Packed up + left site for airport. Gordon ~~init~~ agreed to close up wells because they were going to need some time to get closed + Grant Air flight left @ 1215

1345 - Arrive in Bethel. End of Field work.
Wait for 830 flight back to ANC

945 - Arrive in ANC

RESCON alaska

Groundwater Sampling Record

Project Name: Kwik pak
Site Name:
Date/Time: 7/27/22

Well ID: MW-1
Sample No.: 22-EMNK-MW1
Sampler(s): ML
Weather: Overcast ~55°F

Water Level Measurements and Purge Data

Time	Depth of Well (BTOC)	Depth to Water (BTOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163, 4" dia.=0.653, 3/4" dia = 0.024 gal/ft)
850	6.41 ft	3.02 ft	3.39 ft	0.55 gal

Well Evacuation Method: ☐ Submersible Pump ☐ Bladder Pump ☐ Bailer ☒ Other Peristaltic Pump

Purge Rate: _____ gal/min

Begin Purge: _____

End Purge: _____

Total Volume Purged: _____ gal

Well Volumes Purged: _____

Purge Water Disposed: ☐ GAC N/A ☐ Other: _____

Sample Collection Method & Analysis * Grab Sample

Sample Time: 930

Sample Description (color, turbidity, odor, sheen, etc.): Turbid + possible sheen

Analytical Analysis

- ☒ GRO (3-40 ml VOAs-HCL) AK101
- ☒ DRO/RRO (2-250 ml Amber-HCL) AK102/103
- ☐ VOCs (3-40 mL VOAs-HCL) SW8260B
- ☒ BTEX (3-40 mL VOAs-HCL) SW8260B
- ☐ SVOCs (2-1 Liter Amber) SW8270D
- ☒ PAHs (2-1 Liter Amber) SW8270D SIM
- ☐ Lead (1-250 or 500 ml-HNO3) SW6020
  - ☐ Total (Unfiltered) ☐ Dissolved (Field Filtered)

☐ Other Analyses (List Below)

_____

_____

_____

_____

_____

Sample Duplicate and MS/MSD

☐ MS/MSD

☐ Duplicate ID _____

Notes: Immediately exceeded draw down when filled YSI cup
DTW = 3.42 after ~1 min of pumping

Sampler Signature: _____

RESCON alaska

Groundwater Sampling Record

Project Name: Kwikpak TF
Site Name:
Date/Time: 7/27/22

Well ID: MW-B
Sample No.: 22-EMNK-MW2 (w/DUP)
Sampler(s): ML
Weather: Overcast ~55°F

Water Level Measurements and Purge Data

Time	Depth of Well (BTOC)	Depth to Water (BTOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163, 4" dia.=0.653, 3/4 " dia = 0.024 gal/ft)
850	6.47 (MW) ft 6.11	3.02 (MW) ft 2.29	3.82 ft	0.63 gal

Well Evacuation Method: ☐ Submersible Pump ☐ Bladder Pump ☐ Bailer ☑ Other Peristaltic Pump

Purge Rate: _____ gal/min
Begin Purge: _____
End Purge: _____
Purge Water Disposed: ☐ GAC

Total Volume Purged: _____ gal
Well Volumes Purged: _____
☐ Other: _____

Sample Collection Method & Analysis: ~~X~~ Grab Sample

Sample Time: 950

Sample Description (color, turbidity, odor, sheen, etc.): slightly turbid, no odor/sheen

Analytical Analysis

- ☑ GRO (3-40 ml VOAs-HCL) AK101
- ☑ DRO/RRO (2-250 ml Amber-HCL) AK102/103
- ☐ VOCs (3-40 mL VOAs-HCL) SW8260B
- ☑ BTEX (3-40 mL VOAs-HCL) SW8260B
- ☐ SVOCs (2-1 Liter Amber) SW8270D
- ☑ PAHs (2-1 Liter Amber) SW8270D SIM
- ☐ Lead (1-250 or 500 ml-HNO3) SW6020
  - ☐ Total (Unfiltered) ☐ Dissolved (Field Filtered)

☐ Other Analyses (List Below)

_____
_____
_____
_____
_____

Sample Duplicate and MS/MSD

☐ MS/MSD
☑ Duplicate ID 22-EMNK-MW4 @ 955

Notes: Had to move tubing down water column as pumping/sampling continued.

Sampler Signature: _____

RESCON alaska

Groundwater Sampling Record

Project Name: Kwikpak
Site Name:
Date/Time: 7/27/22

Well ID: MW-3
Sample No.: 22-EMNK-MW3
Sampler(s): ML
Weather: Overcast ~

Water Level Measurements and Purge Data

Time	Depth of Well (BTOC)	Depth to Water (BTOC)	Feet of Water in Well	Gallons per Well Volume (2" dia. = 0.163, 4" dia.=0.653, 3/4 " dia = 0.024 gal/ft)
0853	1.83 ft	5.94 ft	4.11 ft	0.67 gal

Well Evacuation Method: ☐ Submersible Pump ☐ Bladder Pump ☐ Bailer ☒ Other Peristaltic Pump

Purge Rate: _____ gal/min
Begin Purge: _____
End Purge: _____
Purge Water Disposed: ☐ GAC

Total Volume Purged: _____ gal
Well Volumes Purged: _____
☐ Other: _____

Sample Collection Method & Analysis

Sample Time: 1025 ✱ Grab

Sample Description (color, turbidity, odor, sheen, etc.): Sheen present, Mostly Clear

Analytical Analysis

- ☒ GRO (3-40 ml VOAs-HCL) AK101
- ☒ DRO/RRO (2-250 ml Amber-HCL) AK102/103
- ☐ VOCs (3-40 mL VOAs-HCL) SW8260B
- ☒ BTEX (3-40 mL VOAs-HCL) SW8260B
- ☐ SVOCs (2-1 Liter Amber) SW8270D
- ☒ PAHs (2-1 Liter Amber) SW8270D SIM
- ☐ Lead (1-250 or 500 ml-HNO3) SW6020
  - ☐ Total (Unfiltered) ☐ Dissolved (Field Filtered)

☐ Other Analyses (List Below)

_____
_____
_____
_____
_____

Sample Duplicate and MS/MSD

☐ MS/MSD
☐ Duplicate ID _____

Notes:

Sampler Signature: _____

Surface Water Sampling Record

Project Name: Kwikpak TF
Site Name
Date/Time: 7/27/22

Location ID: SW-1
Sample No.: 22-EMNK-SW1
Sampler(s): ML
Weather: Overcast 55°F

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Seep ☐ Other:

Sample Time: 0845

Sample Collection Method: ☐ Grab ☐ Bailer ☒ Other: peri pump

Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): turbid, no odor / sheen

Field Parameters (If Needed)

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Analytical Analysis

- ☒ GRO (3-40 ml VOAs-HCL) AK101
- ☒ DRO/RRO (2-250 ml Amber-HCL) AK102/103
- ☐ VOCs (3-40 mL VOAs-HCL) SW8260B
- ☒ BTEX (3-40 mL VOAs-HCL) SW8260B
- ☐ SVOCs (2-1 Liter Amber) SW8270D
- ☒ PAHs (2-1 Liter Amber) SW8270D SIM
- ☐ Metals (1-250 or 500 ml-HNO3) SW6020
  - ☐ Total (Unfiltered) ☐ Dissolved (Field Filtered)
- ☐ Other Analyses (List Below)

Sample Duplicate and MS/MSD

- ☐ MS/MSD
- ☐ Duplicate ID

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name: KwikPak TF
Site Name
Date/Time: 7/27/22

Location ID: SW-2
Sample No.: 22-EMNK-SW2
Sampler(s): ML
Weather: Overcast ~55°F

Sample Collection Method & Analysis

Sample Type: ☑ Surface Water ☐ Seep ☐ Other:

Sample Time: 1045

Sample Collection Method: ☐ Grab ☐ Bailer ☑ Other: Peri Pump

Decon Procedure: ☑ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:

Sample Description (color, turbidity, odor, sheen, etc.): none

Field Parameters (If Needed)

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Analytical Analysis

- ☑ GRO (3-40 ml VOAs-HCL) AK101
- ☑ DRO/RRO (2-250 ml Amber-HCL) AK102/103
- ☐ VOCs (3-40 mL VOAs-HCL) SW8260B
- ☑ BTEX (3-40 mL VOAs-HCL) SW8260B
- ☐ SVOCs (2-1 Liter Amber) SW8270D
- ☑ PAHs (2-1 Liter Amber) SW8270D SIM
- ☐ Metals (1-250 or 500 ml-HNO3) SW6020
  - ☐ Total (Unfiltered) ☐ Dissolved (Field Filtered)
- ☐ Other Analyses (List Below)

Sample Duplicate and MS/MSD

- ☐ MS/MSD
- ☐ Duplicate ID

Notes:

Sampler Signature:

Surface Water Sampling Record

Project Name: Kwik Pak TF
Site Name
Date/Time: 7/27/22
Location ID: SW-3
Sample No.: 22-EMNK-SW3
Sampler(s): ML
Weather: Overcast ~55°F

Sample Collection Method & Analysis

Sample Type: ☒ Surface Water ☐ Seep ☐ Other:
Sample Time: 1100
Sample Collection Method: ☒ Grab ☐ Bailer ☐ Other:
Decon Procedure: ☒ N/A ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Other:
Sample Description (color, turbidity, odor, sheen, etc.): None

Field Parameters (If Needed)

Time	Temp (°C)	Cond (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color/ Turbidity

Analytical Analysis

- ☒ GRO (3-40 ml VOAs-HCL) AK101
- ☒ DRO/RRO (2-250 ml Amber-HCL) AK102/103
- ☐ VOCs (3-40 mL VOAs-HCL) SW8260B
- ☒ BTEX (3-40 mL VOAs-HCL) SW8260B
- ☐ SVOCs (2-1 Liter Amber) SW8270D
- ☒ PAHs (2-1 Liter Amber) SW8270D SIM
- ☐ Metals (1-250 or 500 ml-HNO3) SW6020
  - ☐ Total (Unfiltered) ☐ Dissolved (Field Filtered)
- ☐ Other Analyses (List Below)

Sample Duplicate and MS/MSD

- ☒ MS/MSD
- ☐ Duplicate ID

Notes:

Sampler Signature:

APPENDIX B

Laboratory Analytical Report

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Laboratory Report of Analysis

To: ResCon Alaska
8361 Petersburg St.
Anchorage, AK 99507
(360)761-4269

Report Number: **1224324**

Client Project: **Emmonak TF**

Dear Zack Kirk,

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 Date
Project Manager
Justin.Nelson@sgs.com

Case Narrative

SGS Client: **ResCon Alaska**
SGS Project: **1224324**
Project Name/Site: **Emmonak TF**
Project Contact: **Zack Kirk**

Refer to sample receipt form for information on sample condition.

22-EMNK-MW1 (1224324001) PS

8260D - Surrogate recovery for 1,2-Dichloroethane-D4 does not meet QC criteria. All associated analytes are not being reported above the LOQ.

22-EMNK-MW4 (1224324004) PS

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria.

22-EMNK-SW3(1224324007BMS) (1224324009) BMS

8270D SIM - PAH BMS recoveries for several analytes do not meet QC criteria. See LCS for accuracy requirements,

22-EMNK-SW3(1224324007BMSD) (1224324010) BMSD

AK102 - BMSD RPD does not meet QC criteria.
8270D SIM - PAH BMSD recoveries for several analytes do not meet QC criteria. See LCS for accuracy requirements,

MB for HBN 1840802 [XXX/46746] (1677459) MB

AK102 - Surrogate recoveries in the MB for 5a-androstane do not meet QC criteria; however, the surrogate recoveries in the samples are within criteria.
AK103 - RRO is detected in the MB above the LOQ. The associated sample concentrations may be biasaed high.

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

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 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.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
22-EMNK-MW1	1224324001	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
22-EMNK-MW2	1224324002	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
22-EMNK-MW3	1224324003	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
22-EMNK-MW4	1224324004	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
22-EMNK-SW1	1224324005	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
22-EMNK-SW2	1224324006	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
22-EMNK-SW3	1224324007	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
TRIP BLANK	1224324008	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
22-EMNK-SW3(1224324007BMS	1224324009	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)
22-EMNK-SW3(1224324007BMS	1224324010	07/27/2022	07/28/2022	Water (Surface, Eff., Ground)

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

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Detectable Results Summary

Client Sample ID: **22-EMNK-MW1**
Lab Sample ID: 1224324001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.327J	mg/L
	Residual Range Organics	0.560	mg/L

Client Sample ID: **22-EMNK-MW2**
Lab Sample ID: 1224324002

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Naphthalene	0.0357J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.598	mg/L
	Residual Range Organics	0.547	mg/L
Volatile Fuels	Gasoline Range Organics	0.295	mg/L
Volatile GC/MS	Benzene	84.1	ug/L
	Toluene	1.12	ug/L

Client Sample ID: **22-EMNK-MW3**
Lab Sample ID: 1224324003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.496J	mg/L
	Residual Range Organics	0.571	mg/L
Volatile GC/MS	Benzene	2.06	ug/L

Client Sample ID: **22-EMNK-MW4**
Lab Sample ID: 1224324004

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.0201J	ug/L
	2-Methylnaphthalene	0.0211J	ug/L
	Naphthalene	0.0527J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.645	mg/L
	Residual Range Organics	0.590	mg/L
Volatile Fuels	Gasoline Range Organics	0.278	mg/L
Volatile GC/MS	Benzene	88.0	ug/L
	Toluene	1.19	ug/L

Client Sample ID: **22-EMNK-SW1**
Lab Sample ID: 1224324005

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	2-Methylnaphthalene	0.0161J	ug/L
Semivolatile Organic Fuels	Residual Range Organics	0.418J	mg/L

Client Sample ID: **22-EMNK-SW2**
Lab Sample ID: 1224324006

	Parameter	Result	Units
Semivolatile Organic Fuels	Residual Range Organics	0.388J	mg/L

Client Sample ID: **22-EMNK-SW3**
Lab Sample ID: 1224324007

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	2-Methylnaphthalene	0.0146J	ug/L
Semivolatile Organic Fuels	Residual Range Organics	0.340J	mg/L

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Results of **22-EMNK-MW1**

Client Sample ID: **22-EMNK-MW1**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324001
Lab Project ID: 1224324

Collection Date: 07/27/22 09:30
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
2-Methylnaphthalene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Acenaphthene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Acenaphthylene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Benzo(a)Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Benzo[a]pyrene	0.0104	U	0.0208	0.00646	ug/L	1		08/11/22 00:08
Benzo[b]Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Benzo[g,h,i]perylene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Benzo[k]fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Chrysene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Dibenzo[a,h]anthracene	0.0104	U	0.0208	0.00646	ug/L	1		08/11/22 00:08
Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Fluorene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Indeno[1,2,3-c,d] pyrene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Naphthalene	0.0520	U	0.104	0.0323	ug/L	1		08/11/22 00:08
Phenanthrene	0.0520	U	0.104	0.0323	ug/L	1		08/11/22 00:08
Pyrene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:08
Surrogates								
2-Methylnaphthalene-d10 (surr)	53.1		42-86		%	1		08/11/22 00:08
Fluoranthene-d10 (surr)	60.4		50-97		%	1		08/11/22 00:08

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Analyst: NRB
Analytical Date/Time: 08/11/22 00:08
Container ID: 1224324001-I

Prep Batch: XXX46712
Prep Method: SW3535A
Prep Date/Time: 07/30/22 17:28
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-MW1**

Client Sample ID: **22-EMNK-MW1**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324001
Lab Project ID: 1224324

Collection Date: 07/27/22 09:30
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.327	J	0.612	0.204	mg/L	1		08/08/22 18:51
Surrogates								
5a Androstane (surr)	56.4		50-150		%	1		08/08/22 18:51

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/08/22 18:51
Container ID: 1224324001-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.560		0.510	0.204	mg/L	1		08/08/22 18:51
Surrogates								
n-Triacontane-d62 (surr)	65.7		50-150		%	1		08/08/22 18:51

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/08/22 18:51
Container ID: 1224324001-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Results of **22-EMNK-MW1**

Client Sample ID: **22-EMNK-MW1**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324001
Lab Project ID: 1224324

Collection Date: 07/27/22 09:30
Received Date: 07/28/22 16:24
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	0.0500	U	0.100	0.0450	mg/L	1		07/29/22 22:01
Surrogates								
4-Bromofluorobenzene (surr)	94.2		50-150		%	1		07/29/22 22:01

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 07/29/22 22:01
Container ID: 1224324001-A

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 07/29/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-MW1**

Client Sample ID: **22-EMNK-MW1**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324001
Lab Project ID: 1224324

Collection Date: 07/27/22 09:30
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U		0.400	0.120	ug/L	1		08/04/22 19:04
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:04
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:04
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/04/22 19:04
Toluene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:04
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		08/04/22 19:04
Surrogates								
1,2-Dichloroethane-D4 (surr)	129	*	81-118		%	1		08/04/22 19:04
4-Bromofluorobenzene (surr)	102		85-114		%	1		08/04/22 19:04
Toluene-d8 (surr)	98.4		89-112		%	1		08/04/22 19:04

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/04/22 19:04
Container ID: 1224324001-D

Prep Batch: VXX38959
Prep Method: SW5030B
Prep Date/Time: 08/04/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-MW2**

Client Sample ID: **22-EMNK-MW2**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324002
Lab Project ID: 1224324

Collection Date: 07/27/22 09:50
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
2-Methylnaphthalene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Acenaphthene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Acenaphthylene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Benzo(a)Anthracene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Benzo[a]pyrene	0.0104	U	0.0208	0.00646	ug/L	1		08/11/22 00:29
Benzo[b]Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Benzo[g,h,i]perylene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Benzo[k]fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Chrysene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Dibenzo[a,h]anthracene	0.0104	U	0.0208	0.00646	ug/L	1		08/11/22 00:29
Fluoranthene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Fluorene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Indeno[1,2,3-c,d] pyrene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Naphthalene	0.0357	J	0.104	0.0323	ug/L	1		08/11/22 00:29
Phenanthrene	0.0520	U	0.104	0.0323	ug/L	1		08/11/22 00:29
Pyrene	0.0261	U	0.0521	0.0156	ug/L	1		08/11/22 00:29
Surrogates								
2-Methylnaphthalene-d10 (surr)	57.6		42-86		%	1		08/11/22 00:29
Fluoranthene-d10 (surr)	52.9		50-97		%	1		08/11/22 00:29

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Analyst: NRB
Analytical Date/Time: 08/11/22 00:29
Container ID: 1224324002-I

Prep Batch: XXX46712
Prep Method: SW3535A
Prep Date/Time: 07/30/22 17:28
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-MW2**

Client Sample ID: **22-EMNK-MW2**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324002
Lab Project ID: 1224324

Collection Date: 07/27/22 09:50
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.598		0.577	0.192	mg/L	1		08/08/22 19:01
Surrogates								
5a Androstane (surr)	58.7		50-150		%	1		08/08/22 19:01

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/08/22 19:01
Container ID: 1224324002-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.547		0.481	0.192	mg/L	1		08/08/22 19:01
Surrogates								
n-Triacontane-d62 (surr)	63.1		50-150		%	1		08/08/22 19:01

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/08/22 19:01
Container ID: 1224324002-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **22-EMNK-MW2**

Client Sample ID: **22-EMNK-MW2**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324002
Lab Project ID: 1224324

Collection Date: 07/27/22 09:50
Received Date: 07/28/22 16:24
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	0.295		0.100	0.0450	mg/L	1		07/29/22 23:52
Surrogates								
4-Bromofluorobenzene (surr)	91		50-150		%	1		07/29/22 23:52

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 07/29/22 23:52
Container ID: 1224324002-A

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 07/29/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-MW2**

Client Sample ID: **22-EMNK-MW2**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324002
Lab Project ID: 1224324

Collection Date: 07/27/22 09:50
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	84.1		0.400	0.120	ug/L	1		08/04/22 16:49
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/04/22 16:49
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/04/22 16:49
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/04/22 16:49
Toluene	1.12		1.00	0.310	ug/L	1		08/04/22 16:49
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		08/04/22 16:49
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		08/04/22 16:49
4-Bromofluorobenzene (surr)	96.8		85-114		%	1		08/04/22 16:49
Toluene-d8 (surr)	100		89-112		%	1		08/04/22 16:49

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/04/22 16:49
Container ID: 1224324002-D

Prep Batch: VXX38959
Prep Method: SW5030B
Prep Date/Time: 08/04/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-MW3**

Client Sample ID: **22-EMNK-MW3**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324003
Lab Project ID: 1224324

Collection Date: 07/27/22 10:25
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
2-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		08/11/22 00:50
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		08/11/22 00:50
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Naphthalene	0.0490	U	0.0980	0.0304	ug/L	1		08/11/22 00:50
Phenanthrene	0.0490	U	0.0980	0.0304	ug/L	1		08/11/22 00:50
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 00:50
Surrogates								
2-Methylnaphthalene-d10 (surr)	50.1		42-86		%	1		08/11/22 00:50
Fluoranthene-d10 (surr)	54.6		50-97		%	1		08/11/22 00:50

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Analyst: NRB
Analytical Date/Time: 08/11/22 00:50
Container ID: 1224324003-I

Prep Batch: XXX46712
Prep Method: SW3535A
Prep Date/Time: 07/30/22 17:28
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-MW3**

Client Sample ID: **22-EMNK-MW3**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324003
Lab Project ID: 1224324

Collection Date: 07/27/22 10:25
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.496	J	0.600	0.200	mg/L	1		08/08/22 19:10
Surrogates								
5a Androstane (surr)	51.9		50-150		%	1		08/08/22 19:10

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/08/22 19:10
Container ID: 1224324003-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.571		0.500	0.200	mg/L	1		08/08/22 19:10
Surrogates								
n-Triacontane-d62 (surr)	56.1		50-150		%	1		08/08/22 19:10

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/08/22 19:10
Container ID: 1224324003-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Results of **22-EMNK-MW3**

Client Sample ID: **22-EMNK-MW3**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324003
Lab Project ID: 1224324

Collection Date: 07/27/22 10:25
Received Date: 07/28/22 16:24
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	0.0500	U	0.100	0.0450	mg/L	1		07/30/22 00:11
Surrogates								
4-Bromofluorobenzene (surr)	89.7		50-150		%	1		07/30/22 00:11

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 07/30/22 00:11
Container ID: 1224324003-A

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 07/29/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-MW3**

Client Sample ID: **22-EMNK-MW3**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324003
Lab Project ID: 1224324

Collection Date: 07/27/22 10:25
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	2.06		0.400	0.120	ug/L	1		08/04/22 19:19
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		08/04/22 19:19
o-Xylene	0.500	U	1.00	0.310	ug/L	1		08/04/22 19:19
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		08/04/22 19:19
Toluene	0.500	U	1.00	0.310	ug/L	1		08/04/22 19:19
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		08/04/22 19:19
Surrogates								
1,2-Dichloroethane-D4 (surr)	110		81-118		%	1		08/04/22 19:19
4-Bromofluorobenzene (surr)	97.7		85-114		%	1		08/04/22 19:19
Toluene-d8 (surr)	99.8		89-112		%	1		08/04/22 19:19

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/04/22 19:19
Container ID: 1224324003-D

Prep Batch: VXX38959
Prep Method: SW5030B
Prep Date/Time: 08/04/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-MW4**

Client Sample ID: **22-EMNK-MW4**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324004
Lab Project ID: 1224324

Collection Date: 07/27/22 09:55
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0201	J	0.0490	0.0147	ug/L	1		08/11/22 01:10
2-Methylnaphthalene	0.0211	J	0.0490	0.0147	ug/L	1		08/11/22 01:10
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		08/11/22 01:10
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		08/11/22 01:10
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Naphthalene	0.0527	J	0.0980	0.0304	ug/L	1		08/11/22 01:10
Phenanthrene	0.0490	U	0.0980	0.0304	ug/L	1		08/11/22 01:10
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:10
Surrogates								
2-Methylnaphthalene-d10 (surr)	62.1		42-86		%	1		08/11/22 01:10
Fluoranthene-d10 (surr)	46.3	*	50-97		%	1		08/11/22 01:10

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Analyst: NRB
Analytical Date/Time: 08/11/22 01:10
Container ID: 1224324004-I

Prep Batch: XXX46712
Prep Method: SW3535A
Prep Date/Time: 07/30/22 17:28
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-MW4**

Client Sample ID: **22-EMNK-MW4**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324004
Lab Project ID: 1224324

Collection Date: 07/27/22 09:55
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.645		0.625	0.208	mg/L	1		08/08/22 19:20
Surrogates								
5a Androstane (surr)	55.8		50-150		%	1		08/08/22 19:20

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/08/22 19:20
Container ID: 1224324004-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.590		0.521	0.208	mg/L	1		08/08/22 19:20
Surrogates								
n-Triacontane-d62 (surr)	62.4		50-150		%	1		08/08/22 19:20

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/08/22 19:20
Container ID: 1224324004-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Results of **22-EMNK-MW4**

Client Sample ID: **22-EMNK-MW4**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324004
Lab Project ID: 1224324

Collection Date: 07/27/22 09:55
Received Date: 07/28/22 16:24
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	0.278		0.100	0.0450	mg/L	1		07/30/22 00:29
Surrogates								
4-Bromofluorobenzene (surr)	88.5		50-150		%	1		07/30/22 00:29

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 07/30/22 00:29
Container ID: 1224324004-A

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 07/29/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-MW4**

Client Sample ID: **22-EMNK-MW4**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324004
Lab Project ID: 1224324

Collection Date: 07/27/22 09:55
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	88.0		0.400	0.120	ug/L	1		08/05/22 01:55
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/05/22 01:55
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/05/22 01:55
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/05/22 01:55
Toluene	1.19		1.00	0.310	ug/L	1		08/05/22 01:55
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		08/05/22 01:55
Surrogates								
1,2-Dichloroethane-D4 (surr)	101		81-118		%	1		08/05/22 01:55
4-Bromofluorobenzene (surr)	95.4		85-114		%	1		08/05/22 01:55
Toluene-d8 (surr)	100		89-112		%	1		08/05/22 01:55

Batch Information

Analytical Batch: VMS21845
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/05/22 01:55
Container ID: 1224324004-B

Prep Batch: VXX38969
Prep Method: SW5030B
Prep Date/Time: 08/04/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-SW1**

Client Sample ID: **22-EMNK-SW1**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324005
Lab Project ID: 1224324

Collection Date: 07/27/22 08:45
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
2-Methylnaphthalene	0.0161	J	0.0490	0.0147	ug/L	1		08/11/22 01:31
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		08/11/22 01:31
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		08/11/22 01:31
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Naphthalene	0.0490	U	0.0980	0.0304	ug/L	1		08/11/22 01:31
Phenanthrene	0.0490	U	0.0980	0.0304	ug/L	1		08/11/22 01:31
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:31
Surrogates								
2-Methylnaphthalene-d10 (surr)	52.5		42-86		%	1		08/11/22 01:31
Fluoranthene-d10 (surr)	58.5		50-97		%	1		08/11/22 01:31

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Analyst: NRB
Analytical Date/Time: 08/11/22 01:31
Container ID: 1224324005-I

Prep Batch: XXX46712
Prep Method: SW3535A
Prep Date/Time: 07/30/22 17:28
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-SW1**

Client Sample ID: **22-EMNK-SW1**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324005
Lab Project ID: 1224324

Collection Date: 07/27/22 08:45
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.313	U	0.625	0.208	mg/L	1		08/08/22 19:30
Surrogates								
5a Androstane (surr)	61.1		50-150		%	1		08/08/22 19:30

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/08/22 19:30
Container ID: 1224324005-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.418	J	0.521	0.208	mg/L	1		08/08/22 19:30
Surrogates								
n-Triacontane-d62 (surr)	62.6		50-150		%	1		08/08/22 19:30

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/08/22 19:30
Container ID: 1224324005-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-SW1**

Client Sample ID: **22-EMNK-SW1**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324005
Lab Project ID: 1224324

Collection Date: 07/27/22 08:45
Received Date: 07/28/22 16:24
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	0.0500	U	0.100	0.0450	mg/L	1		07/30/22 00:47
Surrogates								
4-Bromofluorobenzene (surr)	90.2		50-150		%	1		07/30/22 00:47

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 07/30/22 00:47
Container ID: 1224324005-A

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 07/29/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-SW1**

Client Sample ID: **22-EMNK-SW1**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324005
Lab Project ID: 1224324

Collection Date: 07/27/22 08:45
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U		0.400	0.120	ug/L	1		08/04/22 19:34
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:34
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:34
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/04/22 19:34
Toluene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:34
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		08/04/22 19:34
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		08/04/22 19:34
4-Bromofluorobenzene (surr)	95.6		85-114		%	1		08/04/22 19:34
Toluene-d8 (surr)	100		89-112		%	1		08/04/22 19:34

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/04/22 19:34
Container ID: 1224324005-D

Prep Batch: VXX38959
Prep Method: SW5030B
Prep Date/Time: 08/04/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-SW2**

Client Sample ID: **22-EMNK-SW2**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324006
Lab Project ID: 1224324

Collection Date: 07/27/22 10:45
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
2-Methylnaphthalene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Acenaphthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Acenaphthylene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	ug/L	1		08/11/22 01:52
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Chrysene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	ug/L	1		08/11/22 01:52
Fluoranthene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Fluorene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Naphthalene	0.0490	U	0.0980	0.0304	ug/L	1		08/11/22 01:52
Phenanthrene	0.0490	U	0.0980	0.0304	ug/L	1		08/11/22 01:52
Pyrene	0.0245	U	0.0490	0.0147	ug/L	1		08/11/22 01:52
Surrogates								
2-Methylnaphthalene-d10 (surr)	49.7		42-86		%	1		08/11/22 01:52
Fluoranthene-d10 (surr)	54.9		50-97		%	1		08/11/22 01:52

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Analyst: NRB
Analytical Date/Time: 08/11/22 01:52
Container ID: 1224324006-I

Prep Batch: XXX46712
Prep Method: SW3535A
Prep Date/Time: 07/30/22 17:28
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-SW2**

Client Sample ID: **22-EMNK-SW2**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324006
Lab Project ID: 1224324

Collection Date: 07/27/22 10:45
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.306	U	0.612	0.204	mg/L	1		08/08/22 19:40
Surrogates								
5a Androstane (surr)	63.7		50-150		%	1		08/08/22 19:40

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/08/22 19:40
Container ID: 1224324006-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.388	J	0.510	0.204	mg/L	1		08/08/22 19:40
Surrogates								
n-Triacontane-d62 (surr)	65.5		50-150		%	1		08/08/22 19:40

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/08/22 19:40
Container ID: 1224324006-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-SW2**

Client Sample ID: **22-EMNK-SW2**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324006
Lab Project ID: 1224324

Collection Date: 07/27/22 10:45
Received Date: 07/28/22 16:24
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	0.0500	U	0.100	0.0450	mg/L	1		07/30/22 01:06
Surrogates								
4-Bromofluorobenzene (surr)	90.1		50-150		%	1		07/30/22 01:06

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 07/30/22 01:06
Container ID: 1224324006-A

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 07/29/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-SW2**

Client Sample ID: **22-EMNK-SW2**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324006
Lab Project ID: 1224324

Collection Date: 07/27/22 10:45
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U		0.400	0.120	ug/L	1		08/04/22 19:49
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:49
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:49
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/04/22 19:49
Toluene	0.500 U		1.00	0.310	ug/L	1		08/04/22 19:49
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		08/04/22 19:49
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		08/04/22 19:49
4-Bromofluorobenzene (surr)	98.7		85-114		%	1		08/04/22 19:49
Toluene-d8 (surr)	99.1		89-112		%	1		08/04/22 19:49

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/04/22 19:49
Container ID: 1224324006-D

Prep Batch: VXX38959
Prep Method: SW5030B
Prep Date/Time: 08/04/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-SW3**

Client Sample ID: **22-EMNK-SW3**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324007
Lab Project ID: 1224324

Collection Date: 07/27/22 11:00
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
2-Methylnaphthalene	0.0146	J	0.0481	0.0144	ug/L	1		08/11/22 02:12
Acenaphthene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Benzo[a]pyrene	0.00960	U	0.0192	0.00596	ug/L	1		08/11/22 02:12
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Dibenzo[a,h]anthracene	0.00960	U	0.0192	0.00596	ug/L	1		08/11/22 02:12
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Naphthalene	0.0481	U	0.0962	0.0298	ug/L	1		08/11/22 02:12
Phenanthrene	0.0481	U	0.0962	0.0298	ug/L	1		08/11/22 02:12
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		08/11/22 02:12
Surrogates								
2-Methylnaphthalene-d10 (surr)	51.4		42-86		%	1		08/11/22 02:12
Fluoranthene-d10 (surr)	56.8		50-97		%	1		08/11/22 02:12

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Analyst: NRB
Analytical Date/Time: 08/11/22 02:12
Container ID: 1224324007-I

Prep Batch: XXX46712
Prep Method: SW3535A
Prep Date/Time: 07/30/22 17:28
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:22PM

J flagging is activated

Results of **22-EMNK-SW3**

Client Sample ID: **22-EMNK-SW3**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324007
Lab Project ID: 1224324

Collection Date: 07/27/22 11:00
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.306	U	0.612	0.204	mg/L	1		08/08/22 19:50
Surrogates								
5a Androstane (surr)	62.9		50-150		%	1		08/08/22 19:50

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Analyst: HMW
Analytical Date/Time: 08/08/22 19:50
Container ID: 1224324007-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.340	J	0.510	0.204	mg/L	1		08/08/22 19:50
Surrogates								
n-Triacontane-d62 (surr)	64.9		50-150		%	1		08/08/22 19:50

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Analyst: HMW
Analytical Date/Time: 08/08/22 19:50
Container ID: 1224324007-G

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 08/04/22 16:15
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Results of **22-EMNK-SW3**

Client Sample ID: **22-EMNK-SW3**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324007
Lab Project ID: 1224324

Collection Date: 07/27/22 11:00
Received Date: 07/28/22 16:24
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	0.0500	U	0.100	0.0450	mg/L	1		07/29/22 20:47
Surrogates								
4-Bromofluorobenzene (surr)	97.5		50-150		%	1		07/29/22 20:47

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 07/29/22 20:47
Container ID: 1224324007-A

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 07/29/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **22-EMNK-SW3**

Client Sample ID: **22-EMNK-SW3**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324007
Lab Project ID: 1224324

Collection Date: 07/27/22 11:00
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U		0.400	0.120	ug/L	1		08/04/22 15:05
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/04/22 15:05
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/04/22 15:05
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/04/22 15:05
Toluene	0.500 U		1.00	0.310	ug/L	1		08/04/22 15:05
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		08/04/22 15:05
Surrogates								
1,2-Dichloroethane-D4 (surr)	115		81-118		%	1		08/04/22 15:05
4-Bromofluorobenzene (surr)	99.3		85-114		%	1		08/04/22 15:05
Toluene-d8 (surr)	100		89-112		%	1		08/04/22 15:05

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/04/22 15:05
Container ID: 1224324007-D

Prep Batch: VXX38959
Prep Method: SW5030B
Prep Date/Time: 08/04/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **TRIP BLANK**

Client Sample ID: **TRIP BLANK**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324008
Lab Project ID: 1224324

Collection Date: 07/27/22 08:00
Received Date: 07/28/22 16:24
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	0.0500	U	0.100	0.0450	mg/L	1		07/29/22 19:33
Surrogates								
4-Bromofluorobenzene (surr)	91.8		50-150		%	1		07/29/22 19:33

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Analyst: PHK
Analytical Date/Time: 07/29/22 19:33
Container ID: 1224324008-B

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 07/29/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **TRIP BLANK**

Client Sample ID: **TRIP BLANK**
Client Project ID: **Emmonak TF**
Lab Sample ID: 1224324008
Lab Project ID: 1224324

Collection Date: 07/27/22 08:00
Received Date: 07/28/22 16:24
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U		0.400	0.120	ug/L	1		08/04/22 14:50
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/04/22 14:50
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/04/22 14:50
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/04/22 14:50
Toluene	0.500 U		1.00	0.310	ug/L	1		08/04/22 14:50
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		08/04/22 14:50
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		81-118		%	1		08/04/22 14:50
4-Bromofluorobenzene (surr)	98.5		85-114		%	1		08/04/22 14:50
Toluene-d8 (surr)	100		89-112		%	1		08/04/22 14:50

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/04/22 14:50
Container ID: 1224324008-A

Prep Batch: VXX38959
Prep Method: SW5030B
Prep Date/Time: 08/04/22 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1840620 [VXX/38939]
Blank Lab ID: 1676782

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224324001, 1224324002, 1224324003, 1224324004, 1224324005, 1224324006, 1224324007, 1224324008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	90	50-150		%

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: PHK
Analytical Date/Time: 7/29/2022 12:31:00PM

Prep Batch: VXX38939
Prep Method: SW5030B
Prep Date/Time: 7/29/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1224324 [VXX38939]
Blank Spike Lab ID: 1676785
Date Analyzed: 07/29/2022 13:26

Spike Duplicate ID: LCSD for HBN 1224324 [VXX38939]
Spike Duplicate Lab ID: 1676786
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224324001, 1224324002, 1224324003, 1224324004, 1224324005, 1224324006, 1224324007, 1224324008

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.991	99	1.00	0.991	99	(60-120)	0.03	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		98	0.0500		95	(50-150)	2.70	

Batch Information

Analytical Batch: **VFC16195**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **PHK**

Prep Batch: **VXX38939**
Prep Method: **SW5030B**
Prep Date/Time: **07/29/2022 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

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Billable Matrix Spike Summary

Original Sample ID: 1224324007
MS Sample ID: 1224324009 BMS
MSD Sample ID: 1224324010 BMSD

Analysis Date: 07/29/2022 20:47
Analysis Date: 07/29/2022 21:06
Analysis Date: 07/29/2022 21:24
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **AK101**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	0.0500U	1.00	1.05	105	1.00	1.04	104	60-120	0.83	(< 20)
Surrogates										
4-Bromofluorobenzene (surr)		0.0500	0.0516	103	0.0500	0.0514	103	50-150	0.23	

Batch Information

Analytical Batch: VFC16195
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: PHK
Analytical Date/Time: 7/29/2022 9:06:00PM

Prep Batch: VXX38939
Prep Method: Volatile Fuels Extraction (W)
Prep Date/Time: 7/29/2022 6:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 08/29/2022 12:31:28PM

Method Blank

Blank ID: MB for HBN 1840820 [VXX/38959]
Blank Lab ID: 1677518

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224324001, 1224324002, 1224324003, 1224324005, 1224324006, 1224324007, 1224324008

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	106	81-118		%
4-Bromofluorobenzene (surr)	97.9	85-114		%
Toluene-d8 (surr)	101	89-112		%

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: S.S
Analytical Date/Time: 8/4/2022 12:04:00PM

Prep Batch: VXX38959
Prep Method: SW5030B
Prep Date/Time: 8/4/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1224324 [VXX38959]
Blank Spike Lab ID: 1677519
Date Analyzed: 08/04/2022 12:19

Spike Duplicate ID: LCSD for HBN 1224324 [VXX38959]
Spike Duplicate Lab ID: 1677520
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224324001, 1224324002, 1224324003, 1224324005, 1224324006, 1224324007, 1224324008

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	30	28.6	95	30	28.6	95	(79-120)	0.06	(< 20)
Ethylbenzene	30	29.1	97	30	28.4	95	(79-121)	2.70	(< 20)
o-Xylene	30	29.4	98	30	28.7	96	(78-122)	2.40	(< 20)
P & M -Xylene	60	59.3	99	60	57.8	96	(80-121)	2.50	(< 20)
Toluene	30	28.4	95	30	27.4	91	(80-121)	3.30	(< 20)
Xylenes (total)	90	88.7	99	90	86.5	96	(79-121)	2.50	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		97	30		99	(81-118)	1.60	
4-Bromofluorobenzene (surr)	30		96	30		97	(85-114)	0.90	
Toluene-d8 (surr)	30		100	30		100	(89-112)	0.56	

Batch Information

Analytical Batch: **VMS21843**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **S.S**

Prep Batch: **VXX38959**
Prep Method: **SW5030B**
Prep Date/Time: **08/04/2022 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Billable Matrix Spike Summary

Original Sample ID: 1224324007
MS Sample ID: 1224324009 BMS
MSD Sample ID: 1224324010 BMSD

Analysis Date: 08/04/2022 15:05
Analysis Date: 08/04/2022 13:21
Analysis Date: 08/04/2022 13:36
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **SW8260D**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.200U	30.0	30.5	102	30.0	30.2	101	79-120	1.00	(< 20)
Ethylbenzene	0.500U	30.0	30	100	30.0	30.4	101	79-121	1.20	(< 20)
o-Xylene	0.500U	30.0	30.4	101	30.0	30.8	103	78-122	1.20	(< 20)
P & M -Xylene	1.00U	60.0	61.3	102	60.0	61.9	103	80-121	1.00	(< 20)
Toluene	0.500U	30.0	28.6	96	30.0	28.8	96	80-121	0.50	(< 20)
Xylenes (total)	1.50U	90.0	91.7	102	90.0	92.7	103	79-121	1.10	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.3	98	30.0	29.5	99	81-118	0.64	
4-Bromofluorobenzene (surr)		30.0	29.6	99	30.0	29.6	99	85-114	0.05	
Toluene-d8 (surr)		30.0	28.9	96	30.0	29.0	97	89-112	0.30	

Batch Information

Analytical Batch: VMS21843
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: S.S
Analytical Date/Time: 8/4/2022 1:21:00PM

Prep Batch: VXX38959
Prep Method: Volatiles Extraction 8240/8260
Prep Date/Time: 8/4/2022 6:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 08/29/2022 12:31:33PM

Method Blank

Blank ID: MB for HBN 1841101 [VXX/38969]
Blank Lab ID: 1678352

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224324004

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	107	81-118		%
4-Bromofluorobenzene (surr)	96.2	85-114		%
Toluene-d8 (surr)	101	89-112		%

Batch Information

Analytical Batch: VMS21845
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: S.S
Analytical Date/Time: 8/4/2022 8:49:00PM

Prep Batch: VXX38969
Prep Method: SW5030B
Prep Date/Time: 8/4/2022 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1224324 [VXX38969]
Blank Spike Lab ID: 1678353
Date Analyzed: 08/04/2022 21:04

Spike Duplicate ID: LCSD for HBN 1224324 [VXX38969]
Spike Duplicate Lab ID: 1678354
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224324004

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	30	29.6	99	30	29.1	97	(79-120)	1.70	(< 20)
Ethylbenzene	30	30.2	101	30	30.2	101	(79-121)	0.08	(< 20)
o-Xylene	30	30.6	102	30	30.4	101	(78-122)	0.56	(< 20)
P & M -Xylene	60	61.2	102	60	60.8	101	(80-121)	0.65	(< 20)
Toluene	30	29.2	97	30	29.3	98	(80-121)	0.22	(< 20)
Xylenes (total)	90	91.7	102	90	91.2	101	(79-121)	0.62	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		98	30		95	(81-118)	3.30	
4-Bromofluorobenzene (surr)	30		97	30		98	(85-114)	1.70	
Toluene-d8 (surr)	30		100	30		98	(89-112)	1.70	

Batch Information

Analytical Batch: **VMS21845**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **S.S**

Prep Batch: **VXX38969**
Prep Method: **SW5030B**
Prep Date/Time: **08/04/2022 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1840563 [XXX/46712]
Blank Lab ID: 1676481

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224324001, 1224324002, 1224324003, 1224324004, 1224324005, 1224324006, 1224324007

Results by **8270D SIM LV (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0500U	0.100	0.0310	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	54.3	42-86		%
Fluoranthene-d10 (surr)	66.1	50-97		%

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: NRB
Analytical Date/Time: 8/10/2022 11:27:00PM

Prep Batch: XXX46712
Prep Method: SW3535A
Prep Date/Time: 7/30/2022 5:28:15PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:38PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1224324 [XXX46712]
Blank Spike Lab ID: 1676482
Date Analyzed: 08/10/2022 23:48

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224324001, 1224324002, 1224324003, 1224324004, 1224324005, 1224324006, 1224324007

Results by **8270D SIM LV (PAH)**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	2	0.965	48	(41-115)
2-Methylnaphthalene	2	0.908	45	(39-114)
Acenaphthene	2	1.12	56	(48-114)
Acenaphthylene	2	1.14	57	(35-121)
Anthracene	2	1.23	61	(53-119)
Benzo(a)Anthracene	2	1.31	65	(59-120)
Benzo[a]pyrene	2	1.37	69	(53-120)
Benzo[b]Fluoranthene	2	1.33	67	(53-126)
Benzo[g,h,i]perylene	2	1.57	79	(44-128)
Benzo[k]fluoranthene	2	1.44	72	(54-125)
Chrysene	2	1.38	69	(57-120)
Dibenzo[a,h]anthracene	2	1.57	78	(44-131)
Fluoranthene	2	1.28	64	(58-120)
Fluorene	2	1.20	60	(50-118)
Indeno[1,2,3-c,d] pyrene	2	1.51	76	(48-130)
Naphthalene	2	0.934	47	(43-114)
Phenanthrene	2	1.27	63	(53-115)
Pyrene	2	1.30	65	(53-121)
Surrogates				
2-Methylnaphthalene-d10 (surr)	2		45	(42-86)
Fluoranthene-d10 (surr)	2		63	(50-97)

Batch Information

Analytical Batch: **XMS13285**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **NRB**

Prep Batch: **XXX46712**
Prep Method: **SW3535A**
Prep Date/Time: **07/30/2022 17:28**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/29/2022 12:31:41PM

Billable Matrix Spike Summary

Original Sample ID: 1224324007
MS Sample ID: 1224324009 BMS
MSD Sample ID: 1224324010 BMSD

Analysis Date: 08/11/2022 2:12
Analysis Date: 08/11/2022 2:33
Analysis Date: 08/11/2022 2:53
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **8270D SIM LV (PAH)**

		Matrix Spike (ug/L)				Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.0240U	2.00	.905	45		2.00	0.978	49		41-115	7.70	(< 20)
2-Methylnaphthalene	0.0146J	2.00	.883	43		2.00	0.951	47		39-114	7.50	(< 20)
Acenaphthene	0.0240U	2.00	1.01	51		2.00	1.08	54		48-114	6.40	(< 20)
Acenaphthylene	0.0240U	2.00	1.03	51		2.00	1.08	54		35-121	4.70	(< 20)
Anthracene	0.0240U	2.00	1.02	51	*	2.00	1.07	54		53-119	4.80	(< 20)
Benzo(a)Anthracene	0.0240U	2.00	.921	46	*	2.00	0.978	49	*	59-120	6.10	(< 20)
Benzo[a]pyrene	0.00960U	2.00	.73	37	*	2.00	0.676	34	*	53-120	7.60	(< 20)
Benzo[b]Fluoranthene	0.0240U	2.00	.724	36	*	2.00	0.670	34	*	53-126	7.80	(< 20)
Benzo[g,h,i]perylene	0.0240U	2.00	.607	30	*	2.00	0.536	27	*	44-128	12.30	(< 20)
Benzo[k]fluoranthene	0.0240U	2.00	.834	42	*	2.00	0.752	38	*	54-125	10.40	(< 20)
Chrysene	0.0240U	2.00	.973	49	*	2.00	0.994	50	*	57-120	2.20	(< 20)
Dibenzo[a,h]anthracene	0.00960U	2.00	.631	32	*	2.00	0.571	29	*	44-131	9.80	(< 20)
Fluoranthene	0.0240U	2.00	1.04	52	*	2.00	1.19	59		58-120	12.90	(< 20)
Fluorene	0.0240U	2.00	1.05	52		2.00	1.09	55		50-118	4.10	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0240U	2.00	.594	30	*	2.00	0.517	26	*	48-130	13.80	(< 20)
Naphthalene	0.0481U	2.00	.919	46		2.00	0.981	49		43-114	6.50	(< 20)
Phenanthrene	0.0481U	2.00	1.08	54		2.00	1.12	56		53-115	3.40	(< 20)
Pyrene	0.0240U	2.00	1.04	52	*	2.00	1.16	58		53-121	11.30	(< 20)
Surrogates												
2-Methylnaphthalene-d10 (surr)		2.00	.862	43		2.00	0.952	48		42-86	9.90	
Fluoranthene-d10 (surr)		2.00	1.05	52		2.00	1.18	59		50-97	12.10	

Batch Information

Analytical Batch: XMS13285
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: NRB
Analytical Date/Time: 8/11/2022 2:33:00AM

Prep Batch: XXX46712
Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
Prep Date/Time: 7/30/2022 5:28:15PM
Prep Initial Wt./Vol.: 250.00mL
Prep Extract Vol: 1.00mL

Print Date: 08/29/2022 12:31:41PM

Method Blank

Blank ID: MB for HBN 1840802 [XXX/46746]
Blank Lab ID: 1677459

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224324001, 1224324002, 1224324003, 1224324004, 1224324005, 1224324006, 1224324007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.200	mg/L
Surrogates				
5a Androstane (surr)	59*	60-120		%

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: HMW
Analytical Date/Time: 8/8/2022 5:03:00PM

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 8/4/2022 4:15:44PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2022 12:31:43PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1224324 [XXX46746]
Blank Spike Lab ID: 1677460
Date Analyzed: 08/08/2022 17:12

Spike Duplicate ID: LCSD for HBN 1224324 [XXX46746]
Spike Duplicate Lab ID: 1677461
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224324001, 1224324002, 1224324003, 1224324004, 1224324005, 1224324006, 1224324007

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	15.6	78	20	14.3	71	* (75-125)	9.30	(< 20)
Surrogates									
5a Androstane (surr)	0.4		77	0.4		69	(60-120)	10.20	

Batch Information

Analytical Batch: **XFC16310**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **HMW**

Prep Batch: **XXX46746**
Prep Method: **SW3520C**
Prep Date/Time: **08/04/2022 16:15**
Spike Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL

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Billable Matrix Spike Summary

Original Sample ID: 1224324007
MS Sample ID: 1224324009 BMS
MSD Sample ID: 1224324010 BMSD

Analysis Date: 08/08/2022 19:50
Analysis Date: 08/08/2022 20:00
Analysis Date: 08/08/2022 20:10
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **AK102**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	0.306U	20.0	16.2	81	20.4	14.8	72 *	75-125	9.50	(< 30)
Surrogates										
5a Androstane (surr)		0.400	.304	76	0.408	0.298	73	50-150	2.00	

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: HMW
Analytical Date/Time: 8/8/2022 8:00:00PM

Prep Batch: XXX46746
Prep Method: Cnt. Liq/Liq Ext. for AK102/3 Low Vol
Prep Date/Time: 8/4/2022 4:15:44PM
Prep Initial Wt./Vol.: 250.00mL
Prep Extract Vol: 1.00mL

Print Date: 08/29/2022 12:31:46PM

Method Blank

Blank ID: MB for HBN 1840802 [XXX/46746]
Blank Lab ID: 1677459

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1224324001, 1224324002, 1224324003, 1224324004, 1224324005, 1224324006, 1224324007

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	1.43*	0.500	0.200	mg/L
Surrogates				
n-Triacontane-d62 (surr)	65.5	60-120		%

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: HMW
Analytical Date/Time: 8/8/2022 5:03:00PM

Prep Batch: XXX46746
Prep Method: SW3520C
Prep Date/Time: 8/4/2022 4:15:44PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1224324 [XXX46746]
Blank Spike Lab ID: 1677460
Date Analyzed: 08/08/2022 17:12

Spike Duplicate ID: LCSD for HBN 1224324 [XXX46746]
Spike Duplicate Lab ID: 1677461
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1224324001, 1224324002, 1224324003, 1224324004, 1224324005, 1224324006, 1224324007

Results by **AK103**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	20	15.2	76	20	14.4	72	(60-120)	5.50	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4		86	0.4		76	(60-120)	12.20	

Batch Information

Analytical Batch: **XFC16310**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **HMW**

Prep Batch: **XXX46746**
Prep Method: **SW3520C**
Prep Date/Time: **08/04/2022 16:15**
Spike Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 0.4 mg/L Extract Vol: 1 mL

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Billable Matrix Spike Summary

Original Sample ID: 1224324007
MS Sample ID: 1224324009 BMS
MSD Sample ID: 1224324010 BMSD

Analysis Date: 08/08/2022 19:50
Analysis Date: 08/08/2022 20:00
Analysis Date: 08/08/2022 20:10
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by **AK103**

		Matrix Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	0.340J	20.0	14.8	73	20.4	14.9	71	60-140	0.51	(< 30)
Surrogates										
n-Triacontane-d62 (surr)		0.400	.326	82	0.408	0.349	86	50-150	6.70	

Batch Information

Analytical Batch: XFC16310
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: HMW
Analytical Date/Time: 8/8/2022 8:00:00PM

Prep Batch: XXX46746
Prep Method: Cnt. Liq/Liq Ext. for AK102/3 Low Vol
Prep Date/Time: 8/4/2022 4:15:44PM
Prep Initial Wt./Vol.: 250.00mL
Prep Extract Vol: 1.00mL

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Murphy, Cameron (Anchorage)

From: Moana Leirer <mleirer@resconalaska.com>
Sent: Friday, July 29, 2022 11:46 AM
To: Murphy, Cameron (Anchorage)
Subject: [EXTERNAL] Re: Emmonak TF. BMS/BMSD?

Hi, yes my apologies. That sample is the MS/D.

Sent from my iPhone

> On Jul 29, 2022, at 8:00 AM, Murphy, Cameron (Anchorage) <Cameron.Murphy@sgs.com> wrote:
>
> Good morning,
>
> We received some samples from you yesterday, and our login staff has a question. Sample 22-EMNK-SW3 was received with extra volume, but it is not labeled as needing an MS/MSD on the COC. Would you like us to log this sample in as a matrix spike, or just as a parent sample with extra volume? Please let me know at your convenience.
>
> Thanks!
>
> **Cameron Murphy**
> **Industries & Environment**
> Project Manager, Alaska
> **SGS North America Inc.**
> 200 West Potter Drive
> 99518 – Anchorage
> Phone: + 01 907 562 2343
> E-mail: Cameron.Murphy@sgs.com
>
>

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1224324

P#365740CDM

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

Section 1

CLIENT: Kwikpak

CONTACT: PHONE #:

PROJECT NAME: Emmonak TF PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Rescon Alaska E-MAIL: mleirer@rescon alaska.com Profile #:

INVOICE TO: Kwik Pak QUOTE #: P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis* AK101 GRO	8260 BTEX	AK102/103 DRO/RRO	8270 SIM PAHs							REMARKS/LOC ID
	~~22-MW1-~~			Ground													
①AJ	22-EMNK-MW1	7/27/22	930	Water	10	G	X	X	X	X							
②AJ	22-EMNK-MW2		950			G											
③AJ	22-EMNK-MW3		1025			G											
④AJ	22-EMNK-MW4		955			G											
⑤AJ	22-EMNK-SW1		0845	SW		G											
⑥AJ	22-EMNK-SW2		0045			G											
⑦AJ	22-EMNK-SW3		1100			G											9AJ 10AJ
⑧AJ	TRIP BLANK	7/27/22	0800	/		/	X	X									

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

Section 5

	Date	Time	
Relinquished By: (1)	7/28/22	1624	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	7/28/22	1624	Received For Laboratory By:

Section 4 DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 5.0 D63 5.4 D62 or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

e-Sample Receipt Form

SGS Workorder #:	1224324	1224324

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 Requirements	*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.	No	
Note: *If information on containers differs from COC, default to COC information for login. If times differ <1hr, record details & login per COC.*		BMS/BMSD not labeled on COC
Were analytical requests clear? *(i.e. method is specified for analyses with multiple option for method (Eg, BTEX 8021 vs 8260, Metals 6020 vs 200.8)*	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

Container Id	Preservative	Container Condition
1224324001-A	HCL to pH < 2	OK
1224324001-B	HCL to pH < 2	OK
1224324001-C	HCL to pH < 2	OK
1224324001-D	HCL to pH < 2	OK
1224324001-E	HCL to pH < 2	OK
1224324001-F	HCL to pH < 2	OK
1224324001-G	HCL to pH < 2	OK
1224324001-H	HCL to pH < 2	OK
1224324001-I	No Preservative Required	OK
1224324001-J	No Preservative Required	OK
1224324002-A	HCL to pH < 2	OK
1224324002-B	HCL to pH < 2	OK
1224324002-C	HCL to pH < 2	OK
1224324002-D	HCL to pH < 2	OK
1224324002-E	HCL to pH < 2	OK
1224324002-F	HCL to pH < 2	OK
1224324002-G	HCL to pH < 2	OK
1224324002-H	HCL to pH < 2	OK
1224324002-I	No Preservative Required	OK
1224324002-J	No Preservative Required	OK
1224324003-A	HCL to pH < 2	OK
1224324003-B	HCL to pH < 2	OK
1224324003-C	HCL to pH < 2	OK
1224324003-D	HCL to pH < 2	OK
1224324003-E	HCL to pH < 2	OK
1224324003-F	HCL to pH < 2	OK
1224324003-G	HCL to pH < 2	OK
1224324003-H	HCL to pH < 2	OK
1224324003-I	No Preservative Required	OK
1224324003-J	No Preservative Required	OK
1224324004-A	HCL to pH < 2	OK
1224324004-B	HCL to pH < 2	OK
1224324004-C	HCL to pH < 2	OK
1224324004-D	HCL to pH < 2	OK
1224324004-E	HCL to pH < 2	OK
1224324004-F	HCL to pH < 2	OK
1224324004-G	HCL to pH < 2	OK
1224324004-H	HCL to pH < 2	OK
1224324004-I	No Preservative Required	OK
1224324004-J	No Preservative Required	OK
1224324005-A	HCL to pH < 2	OK
1224324005-B	HCL to pH < 2	OK
1224324005-C	HCL to pH < 2	OK
1224324005-D	HCL to pH < 2	OK
1224324005-E	HCL to pH < 2	OK
1224324005-F	HCL to pH < 2	OK
1224324005-G	HCL to pH < 2	OK
1224324005-H	HCL to pH < 2	OK
1224324005-I	No Preservative Required	OK
1224324005-J	No Preservative Required	OK
1224324006-A	HCL to pH < 2	OK
1224324006-B	HCL to pH < 2	OK
1224324006-C	HCL to pH < 2	OK
1224324006-D	HCL to pH < 2	OK
1224324006-E	HCL to pH < 2	OK
1224324006-F	HCL to pH < 2	OK
1224324006-G	HCL to pH < 2	OK
1224324006-H	HCL to pH < 2	OK
1224324006-I	No Preservative Required	OK
1224324006-J	No Preservative Required	OK
1224324007-A	HCL to pH < 2	OK
1224324007-B	HCL to pH < 2	OK
1224324007-C	HCL to pH < 2	OK
1224324007-D	HCL to pH < 2	OK
1224324007-E	HCL to pH < 2	OK
1224324007-F	HCL to pH < 2	OK
1224324007-G	HCL to pH < 2	OK
1224324007-H	HCL to pH < 2	OK
1224324007-I	No Preservative Required	OK
1224324007-J	No Preservative Required	OK
1224324008-A	HCL to pH < 2	OK
1224324008-B	HCL to pH < 2	OK
1224324008-C	HCL to pH < 2	OK
1224324008-D	HCL to pH < 2	OK
1224324008-E	HCL to pH < 2	OK
1224324008-F	HCL to pH < 2	OK
1224324009-A	HCL to pH < 2	OK
1224324009-B	HCL to pH < 2	OK
1224324009-C	HCL to pH < 2	OK
1224324009-D	HCL to pH < 2	OK
1224324009-E	HCL to pH < 2	OK
1224324009-F	HCL to pH < 2	OK
1224324009-G	HCL to pH < 2	OK
1224324009-H	HCL to pH < 2	OK
1224324009-I	No Preservative Required	OK
1224324009-J	No Preservative Required	OK
1224324010-A	HCL to pH < 2	OK
1224324010-B	HCL to pH < 2	OK
1224324010-C	HCL to pH < 2	OK
1224324010-D	HCL to pH < 2	OK
1224324010-E	HCL to pH < 2	OK
1224324010-F	HCL to pH < 2	OK
1224324010-G	HCL to pH < 2	OK
1224324010-H	HCL to pH < 2	OK
1224324010-I	No Preservative Required	OK
1224324010-J	No Preservative Required	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.

APPENDIX C

ADEC Laboratory Data Review Checklist

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ADEC Contaminated Sites Program Laboratory Data Review Checklist

Completed By:	Moana Leirer	**CS Site Name:**	Emmonak YDFDA Tank Farm	**Lab Name:**	SGS
Title:	Environmental Scientist	**ADEC File No.:**	2413.38.011	**Lab Report No.:**	1224324
Consulting Firm:	Rescon Alaska	**Hazard ID No.:**	25899	**Lab Report Date:**	8/29/22

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: *All samples were received and analyzed by SGS North America, Inc. in Anchorage, Alaska.*

   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: Samples were not transferred to another "network" lab.

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: Click or tap here to enter text.
   Comments: 1. Groundwater and surface water were not analyzed for full list VOCs. The project team inadvertently requested only the analysis of BTEX compounds.

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): Two coolers were received with temperatures of 5.0 and 5.4 degrees C.
Sample temperature(s): Sample temperature was not recorded
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: Click or tap here to enter text.

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: The sample designated for MS/MSD analysis was not marked on the COC, but was clarified later via email.

e. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Click or tap here to enter text.

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: *The laboratory identified seven QC anomalies in the case narrative, which are discussed in the following sections of this checklist.*

c. Were all the corrective actions documented?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

d. What is the effect on data quality/usability according to the case narrative?
Comments: *The case narrative makes no conclusions regarding data quality or usability.*

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: *All results were reported from extractions and analyses performed within applicable holding times.*

c. Are all soils reported on a dry weight basis?
Yes ☐ No ☐ N/A ☒
Comments: *No soil samples were submitted in this work order.*

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: *LODs and LOQs were compared to the 18 AAC 70 Water Quality Standards for surface water samples, and the 18 AAC 75 Table C Groundwater Cleanup levels (GCLs) for groundwater samples. No summed LODs for total aromatic hydrocarbons (TAH) or total aqueous hydrocarbons (TAqH) exceeded the applicable water quality criteria.*

e. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: Click or tap here to enter text.

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: *AK103 - RRO is detected in the MB above the LOQ associated with prep batch XXX/46746.*

iii. If above LoQ or RL, what samples are affected?
Comments: *Surface water samples 22-EMNK-SW1, 22-EMNK-SW2 and 22-EMNK-SW3 are affected.*

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☐ N/A ☐
Comments: *Samples are flagged with a "J" and may be biased high.*

v. Data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: *Data quality is affected as described above. The impact to data usability is minimal as the results are well below any applicable cleanup levels.*

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 metals or inorganic analyses were performed.*

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: *No samples were affected.*

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☐ No ☐ N/A ☒
Comments: *NA, see above.*

vii. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: *Data quality and usability were not affected.*

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: Click or tap here to enter text.

ii. Metals/Inorganics – Are one MS/MSD reported per matrix, analysis and 20 samples?
Yes ☐ No ☐ N/A ☒
Comments: *No metals or inorganic analyses were performed*

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: *8270D SIM - PAH MS/MSD recoveries for several analytes do not meet QC criteria. See LCS for accuracy requirements*

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: *AK102 - BMSD RPD does not meet QC criteria.*

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: *The sample affected include 22-EMNK-MW2, 22-EMNK-MW4, 22-EMNK-SW1 and 22-EMNK-SW3*

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes ☒ No ☒ N/A ☐
Comments: *The results for 2-methylnaphthalene associated with 22-EMNK-MW4, 22-EMNK-SW1 and 22-EMNK-SW3; the results for 1-methylnaphthalene and naphthalene associated with 22-EMNK-MW2 and 22-EMNK-MW4; and the results for naphthalene associated with 22-*

EMNK-MW2 have been flagged with a "J". They are considered estimated values.

vii. Is the data quality or usability affected?
Yes ☐ No ☒ N/A ☐
Comments: *Data quality is affected as described above. The impact to data usability is minimal.*

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:
**8260D - Surrogate recovery for 1,2-Dichloroethane-D4 associated with 22-EMNK-MW1 does not meet QC criteria. All associated analytes are not being reported above the LOQ.*
**8270D SIM - PAH surrogate recovery for fluoranthene-d10 associated with 22-EMNK-MW4 does not meet QC criteria.*
**AK102 - Surrogate recoveries in the method blank for 5a-androstane do not meet QC criteria; however, the surrogate recoveries in the samples are within criteria.*

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: *The DRO result for 22-EMNK-MW1 and 22-EMNK-MW3 have been flagged with a "J". No other sample data associated with surrogate recoveries have been flagged.*

iv. Is the data quality or usability affected?
Yes ☒ No ☒ N/A ☐
Comments: *Data quality is affected as described above. The impact to data usability is minimal as the results are well below any applicable 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: *: Sample Trip Blank was submitted alongside volatile samples and analyzed for GRO and VOCs.*

ii. Are all results less than LoQ or RL?
Yes ☒ No ☐ N/A ☐
Comments: Click or tap here to enter text.

iii. If above LoQ or RL, what samples are affected?
Comments: *NA, see above.*

iv. Is the data quality or usability affected?
Yes ☐ No ☐ N/A ☐
Comments*: Data quality and usability were not affected.*

f. Field Duplicate

i. Are one field duplicate submitted per matrix, analysis, and 10 project samples?
Yes ☒ No ☐ N/A ☐
Comments: *Sample 22-EMNK-MW4 was submitted as a duplicate of sample 22-EMNK-MW2*

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)

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Is the data quality or usability affected? (Explain)

Yes ☐ No ☒ N/A ☐
Comments: *RPDs were calculated for field duplicate sample pairs where the analyte was quantitatively detected (>LOQ) in at least one of the samples and compared to the 30% recommended measurement quality objective (MQO) for water samples.*

**The RPD for naphthalene (38%) is above the MQO of 30%*
No other RPDs exceeded the 30% MQO.

iv. Is the data quality or usability affected? (Explain)
Yes ☒ No ☐ N/A ☐
Comments: *Data quality is affected as described above. The impact to data usability is minimal as the results are well below any applicable cleanup levels.*

g. Decontamination or Equipment Blanks

i. Were decontamination or equipment blanks collected?
Yes ☐ No ☒ N/A ☒
Comments: *Disposable sampling equipment was used to collect all samples.*

ii. Are all results less than LoQ or RL?
Yes ☐ No ☐ N/A ☒
Comments: Click or tap here to enter text.

iii. If above LoQ or RL, specify what samples are affected.
Comments: NA, see above

iv. Are data quality or usability affected?
Yes ☐ No ☐ N/A ☒
Comments: Click or tap here to enter text.

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.