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FINAL

SITE VISIT 2 SUMMARY REPORT
AIN Water Treatment Plant
Upgrade Project
DEC File Number 360.38.006
WAINWRIGHT, ALASKA



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Submitted To: North Slope Borough Department of CIPM
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Attn: Melissa Bynum, CDT

Subject: FINAL SITE VISIT 2 SUMMARY REPORT, AIN WATER TREATMENT PLANT
UPGRADE PROJECT
DEC FILE NUMBER 360.38.006, WAINWRIGHT, ALASKA

Shannon & Wilson prepared this report following the second field effort in support of the Wainwright Water and Wastewater Treatment Plant (WTP) Upgrade, Project 59145. Our scope of services was specified in our proposal dated May 13, 2020.

The ultimate goal of the project is to shift operational functionality of the WTP from a deteriorating portion of the facility to a planned expansion. The planned expansion area extends to the southeast of the WTP from the eastern face of the existing structure. The expansion will be constructed as a slab-on-grade building. The purpose of this site visit was to implement the approved contaminated-soil management plan (CSMP) as the expansion area footprint was excavated. This report details the field observations, analytical sample results, and the fate and transport of excavated materials.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, please do not hesitate to contact us.

Sincerely,

SHANNON & WILSON, INC.

Adam Wyborny, P.E.
Project Manager

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ACRONYMS

°C	degree centigrade
AAC	Alaska Administrative Code
AST	above ground storage tank
bgs	below the ground surface
CIPM	Capital Improvements Management Program
COC	chain of custody
COPC	contaminant of potential concern
CSMP	contaminated soil management plan
CUL	cleanup level
DEC	Alaska Department of Environmental Conservation
DQO	data quality objective
DRO	diesel range organics
EPA	Environmental Protection Agency
GRO	gasoline range organics
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LDRC	laboratory data review checklist
LOD	limit of detection
LOQ	limit of quantitation
MB	method blank
MS	matrix spike
MSD	matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
NSB	North Slope Borough
PAH	polynuclear aromatic hydrocarbon
PID	photoionization detector
POL	petroleum, oil, and lubricants
ppm	parts per million
QA	quality assurance
QC	quality control
RPD	relative percent difference
RRO	residual range organics
SGS	SGS North America, Inc.
SIM	selected ion monitoring
TB	trip blank
UST	underground storage tank
VOC	volatile organic compound
WTP	water treatment plant

1 INTRODUCTION

Shannon & Wilson prepared this report following the second planned field effort in support of the Wainwright Water and Wastewater Treatment Plant (WTP) Upgrade, Project 59145. The goal of the site visit was to implement the approved contaminated-soil management plan (CSMP) during earthwork activities. A 5,000 square foot (sf) area extending to the southeast from the eastern face of the existing WTP was excavated to a depth of 5 feet below ground surface (bgs). The depth of the excavation was dictated by the need to install thermosiphons within sand-pack beneath the planned structure. The planned addition to the WTP will be constructed as a slab-on-grade building, requiring that unsuitable or otherwise contaminated materials within the footprint be removed from the site. This report details the soil segregation and management efforts, analytical sample results, and disposal and/or reuse of excavated materials.

The analytical results reported from samples collected during this site visit were used to guide disposal criteria for contained materials and characterize the nature of the contamination remaining onsite.

We completed the soil segregation and management effort general accordance with our Alaska Department of Environmental Conservation (DEC)-approved July 2021 CSMP. In August 2021, we coordinated with DEC for disposal of precipitation runoff and thaw water that had accumulated within the excavation. This approved water management proposal is included in Appendix C. The CSMP and water management plan were reviewed and approved by Ms. Lisa Krebs-Barsis.

2 BACKGROUND

According to the DEC contaminated sites database, the suspected source of contamination is a former fuel tank associated with a generator building southeast of the WTP. Multiple historic spills of diesel fuel may also be a contributing source. A limited site assessment in 2001 by Shannon & Wilson identified the need for a comprehensive characterization of the site due to the observed problems with the biocell from the original 1997 cleanup efforts. In 2014, we met with CIPM staff and recommended the site be characterized and re-graded to prevent contaminant migration offsite.

In 2015, 2016, and 2017 on behalf of the North Slope Borough (NSB), limited site characterization was completed by Agviq, LLC. (Agviq) and part of the site was regraded.

Results of those efforts indicate soil petroleum, oil, and lubricant (POL) contamination remains in both the gravel fill and the native soil underlying the pad of the washeteria and WTP. Diesel range organics (DRO) in soil was reported at concentrations above the relevant DEC cleanup level at three locations. Residual range organics (RRO) and gasoline range organics (GRO) were reported at concentrations above their respective ADEC cleanup levels at one location. Eleven onsite monitoring wells were sampled to assess impacts to the seasonally active water table. POL constituents were detected at concentrations above their respective DEC cleanup levels in 10 of the 11 monitoring wells sampled.

The Aqviq report explains a possible connection between storm drains and the supra-permafrost groundwater along Main Street. The report bases this possibility on the occurrence of new exceedances in two of the monitoring wells. In addition, chlorinated compounds found in 2016 have not been previously identified. Agviq concluded there are several potential new release sources in the vicinity, including Alak School, which contribute to the lateral extent of contamination at the WTP.

In April/May 2021 we conducted a limited site characterization of the surficial soils within the planned WTP expansion area. The timing of the site visit was dictated by the anticipated construction schedule. Snow/ice cover overlying frozen gravel and silt limited the characterization efforts to the top two vertical feet. We were unable to sample the onsite monitoring wells due to them being frozen at the time of the site visit. Soil results from this effort identified DRO concentrations exceeding the DEC cleanup level in two surface locations within the expansion area footprint.

2.1 Regulatory Framework

The Wainwright WTP is an active contaminated site (DEC File Number 360.38.006 with Hazard ID 2643). As such, any disturbance to the potentially impacted onsite material must meet DEC requirements and regulations for handling, transport, and treatment/disposal.

DEC site characterization regulations are presented in 18 Alaska Administrative Code (AAC) 75.335. While this project was not intended to be a site characterization or cleanup project, we used these regulations as a guide for the screening, sampling, and handling of potentially contaminated soil encountered during excavation.

3 FIELD ACTIVITIES

Our objectives and methodologies were outlined in our approved CSMP dated July 2021.

On August 2, 2021, Adam Wyborny, a Qualified Environmental Professional (QEP), mobilized to the site to work with an Olgoonik Corporation crew to excavate the WTP eastern expansion area footprint and implement the CSMP. The field effort took 14 days, including a delay related to COVID-19. The QEP collected heated headspace samples and laboratory analytical samples from contained materials removed from the site and the limits of the excavation. Our field notes, including daily field activity reports with site photographs, site notes and sketches, and soil field screening logs are included in Appendix A. Additional field photographs are included in the daily field activity reports.

3.1 Field-Screening

Field screening served two functions during this site visit. Collection of headspace samples during the active phase of excavation informed soil segregation and containment criteria. We collected headspace samples from contained materials and from the limits of the excavation to determine the locations for laboratory analytical samples.

3.1.1 Soil Segregation

Continuous headspace sampling was performed at a rate of one sample per 10 cubic yards (cy) of excavated material, unless obvious visual/olfactory evidence of contamination rendered headspace sampling unnecessary. Gravel fill material excavated from within the top two vertical feet and exhibiting photoionization detector (PID) readings below 10 parts per million (ppm) was piled adjacent to the excavation for reuse as backfill. Material excavated from two or more feet bgs and exhibiting PID readings below 10 ppm was placed within a lined stockpile pending laboratory analytical results. Finally, all materials exhibiting PID readings greater than 10 ppm or visual/olfactory signs of contamination were contained in supersacks. With the exceptions of the two locations identified during the May 2021 Limited Site Characterization, the surficial material largely met the criteria for reuse. However, extensive contamination was encountered in the silty native soils underlying the gravel fill. In total, roughly 250 headspace samples were analyzed during excavation. PID readings ranged between 0.1 ppm and 2,007 ppm. Field screening results from the soil segregation activities are included in the field notes in Appendix A.

3.1.2 Screening the Limits of Excavation

We conducted headspace sampling at the limits of the planned footprint in accordance with Table 2B of the 2019 DEC *Field Sampling Guidance*. A total of 154 headspace samples were collected from the excavation sidewalls. These headspace samples were distributed in rows along the upper and lower horizons of the sidewalls. 70 headspace samples collected from the excavation base. These headspace samples were distributed in a grid configuration

throughout the basal surface area. PID readings ranged between 0.1 ppm and 908.4 ppm (Appendix A).

3.1.3 Screening Contained Material

For waste characterization purposes, 40 randomly selected supersacks at the staging area were opened to facilitate sampling. Headspace samples collected from these 40 supersacks exhibited PID readings ranging between 5.4 ppm and 728.3 ppm, with the majority of the sacks exhibiting PID readings between 150 ppm and 500 ppm (Appendix A).

10 headspace samples were collected from the material contained in the offsite lined stockpile. Two of these headspace samples exhibited PID readings greater than 10 ppm, with the higher of these two headspace samples producing a PID result of 285.9 ppm (Appendix A).

3.2 Analytical Sample Collection

Laboratory analytical samples were collected to characterize the waste material and to identify the types and concentrations of contaminants remaining onsite. Sample results are summarized in Tables 1 through 4.

3.2.1 Waste Characterization Samples from Supersacked Soil

At the time of sampling, 633 supersacks were staged at the offsite laydown yard. Six waste characterization samples and one field-duplicate sample were collected from the staged supersacks. Samples were collected from among the 40 field-screened supersacks exhibiting the highest PID readings.

3.2.2 Characterization Samples from Stockpiled Soil

Soil removed from 2 or more feet bgs and presumed to be potentially clean at the time of excavation was stockpiled offsite. At the conclusion of excavation activities, roughly 100-cy of potentially clean material was stockpiled. Three characterization samples and one field-duplicate sample were collected from this stockpiled material at the locations exhibiting the highest PID readings.

3.2.3 Treated Water Samples

During a COVID-19-related temporary shutdown of the project, thaw water from melting permafrost in the excavation base and runoff from precipitation accumulated in the open excavation. Upon resumption of earthwork activities, it was necessary to pump this water into containment so that excavation could resume before the depth of thaw compromised

more permafrost in the excavation base. Roughly 1,800 gallons of water was contained in a lined holding pond constructed onsite. The water was then pumped through a 35-gallon polydrum containing granular activated carbon (GAC) and into collapsible holding tanks. One analytical water sample and one field-duplicate sample were collected from the effluent of the GAC filter.

3.2.4 Excavation Extent Samples

The 5,000-sf expansion area footprint was excavated to the design limits in portions to minimize the amount of time the underlying permafrost was exposed to ambient air temperatures. These portions were promptly lined with visqueen and backfilled with reusable onsite material and/or clean gravel fill. Confirmation samples were collected at the finished sidewalls and excavation base of the overall footprint as they became accessible. Confirmation samples were generally collected at the locations exhibiting the highest PID readings within each portion of the excavation. However, some sample locations were chosen to capture spatial variability. A total of eight confirmation samples and one field-duplicate sample were collected from the excavation sidewalls. 21 confirmation samples and two field-duplicate samples were collected from the excavation base. The base of the excavation was advanced to a depth of 5 feet bgs, with frozen soils being encountered at roughly 4 feet bgs.

4 TARGET ANALYTES AND SAMPLE ANALYSIS

We submitted the samples to SGS North America, Inc. (SGS) in Fairbanks for analysis of GRO by Alaska Method AK 101, DRO by AK 102, RRO by AK 103, volatile organic compounds (VOCs) by EPA Method 8260D, and polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D selected ion monitoring (SIM). SGS has received approval by the DEC underground storage tank (UST) program and has received National Environmental Laboratory Accreditation Program (NELAP) certification for the requested analyses.

5 ANALYTICAL RESULTS

For this field effort, we provide summary tables of results, a site figure depicting sample locations, the laboratory data reports (as separate files), and completed copies of the DEC laboratory-data review checklists (LDRCs). The LDRCs and a summary of the overall data quality are provided in Appendix B.

We compared soil sample results to DEC Cleanup Levels (CULs) from 18 AAC 75.341 A2 Method One – Petroleum Hydrocarbon Soil Cleanup Levels in the Arctic Zone and Table B1 Method Two – Arctic Zone. Exhibit 4-1 below summarizes the CULs for the site contaminants of potential concern (COPCs).

Exhibit 5-1: Regulatory Cleanup Levels

Contaminant	Soil DEC CULs (mg/kg)
GRO	100
DRO	200
RRO	2,000
VOCs	(Analyte Dependent)
Benzene	16
Toluene	200
Ethylbenzene	72
Total Xylenes	57
PAHs	(Analyte Dependent)

NOTES:

mg/kg - milligrams per kilogram

5.1 Supersacked Soil Analytical Results

The soil contained in supersacks results are presented in Table 1 *Waste Characterization Sample Results*. Analytical results from the waste characterization samples showed that DRO was the primary COPC, though GRO were also shown to exceed the DEC cleanup level in several samples. DRO concentrations reported for these waste characterization samples ranged between 480 mg/kg and 5,480 mg/kg.

5.2 Stockpiled Soil Analytical Results

The results for soil formerly contained in the stockpile are presented in Table 2 *Offsite Stockpile Results Summary*. Two of the three samples collected from the stockpiled soil did not exhibit POL concentrations above DEC cleanup levels. However, one sample exhibited a DRO concentration of 468 mg/kg. We note that the sample exhibiting the DRO exceedance was collected from silty material. The silty native soils mixed in this stockpile represented a much smaller portion of the overall material than the sandy gravel fill. Average DRO concentrations within this stockpile are likely more consistent with the other two characterization samples.

5.3 Treated Excavation Water Analytical Results

The results from the field duplicate samples collected from the effluent of the GAC polydrum indicated that GAC filtration was effective at reducing total aromatic hydrocarbon (TAH) and total aqueous hydrocarbon (TAQH) concentrations below DEC discharge criteria. These criteria are detailed in Table 4 of the DEC *Excavation Dewatering General Permit*.

5.4 Excavation Extent Analytical Results

Results from samples collected at the limits of the planned expansion area footprint indicate the presence of contamination remaining onsite. DRO was again the primary COPC and reported at concentrations between 13.9 mg/kg and 9,710 mg/kg. GRO and RRO were also shown to exceed their DEC CULs in several samples.

6 MATERIAL QUANTITIES AND DISPOSAL

Excavated soils were managed in accordance with the approved CSMP. Water removed from the excavation was managed in accordance with a plan approved by DEC via email on August 18, 2021. Details regarding final quantities, transportation, and disposal of different waste streams are detailed in the following subsections.

6.1 Supersacked Soil Management

At the conclusion of excavation activities, 633 supersacks were staged on a liner at the project laydown yard. We understand that during the installation of the thermosiphons, Olgoonik operators had to slightly extend the southeastern sidewall. This extension resulted in an additional 25-cy of material that was contained in supersacks. Analytical results from the waste characterization samples indicated that the soil met the acceptance criteria for the Oxbow Landfill in Prudhoe Bay, AK. 335 supersacks were shipped on the barge to the Oxbow Landfill in September 2021. The barge was unable to accommodate the remaining 298 supersacks due to a facility maintenance issue forcing a reduction in the total allowable transport tonnage. The NSB barged the remaining supersacks to the Oxbow Landfill during the 2022 shipping season.

6.2 Stockpiled Soil Management

At the conclusion of excavation activities, roughly 100-cy of material was contained in a lined offsite stockpile. Following the receipt of the analytical results, it was determined that this soil met the disposal criteria for polluted soils in class III landfills. The disposal request

was approved by the Wainwright landfill manager and the DEC Solid Waste Division on September 22, 2021. Copies of the disposal request approvals are included in Appendix D. The contents of this stockpile were brought to the Wainwright Landfill to be used as daily cover material.

6.3 Treated Water Management

Following the receipt of the treated water analytical results, we requested permission to discharge the water onsite. DEC granted discharge approval on September 1, 2021. The treated water was gradually discharged to the ground surface.

7 DEVIATIONS

Work was conducted in general accordance with our approved CSMP. However, water management was not addressed in the CSMP. Based on the target depth of excavation and the reported water levels from prior years in the onsite monitoring wells, it was assumed excavation dewatering would not be required. While it was true that supra-permafrost groundwater was not encountered, thawing permafrost and precipitation runoff began accumulating in the open excavation. Following a COVID-19 related pause in the project, it became necessary to remove the pooling water so that work could continue. The approved proposal for treatment and disposal of the excavation water is provided in Appendix C.

The waste characterization samples from the supersacked soil and the treated water samples were submitted to the laboratory on a 5-day rush analysis rather than the standard turnaround as originally planned. This was done so that transport and disposal could be approved in time for the supersacks to make the barge during the 2021 season. We note that only half the supersacks were loaded out on the barge during the 2021 season due to maintenance issues at the receiving facility. The remaining supersacks were transported to the NSB Oxbow Landfill during the 2022 shipping season.

8 CONCLUSIONS AND RECOMMENDATIONS

By working in accordance with our approved CSMP we were able to safely excavate, contain, and dispose of a large quantity of POL contaminated soil at the site of the planned eastern expansion of the Wainwright WTP. In-situ sample results show that there is contamination remaining onsite. However, several potentially clean edges were delineated during excavation and results from headspace samples suggest the most heavily contaminated material (aside from that underneath the existing structure) was removed and

contained. The eastern addition to the WTP will be constructed on five vertical feet of clean fill overlying thermosiphons. Freeze-back should limit vapor intrusion concerns but a robust vapor barrier for the building is recommended.

9 REFERENCES

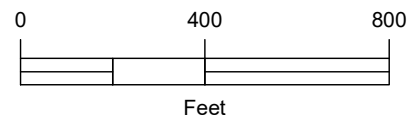
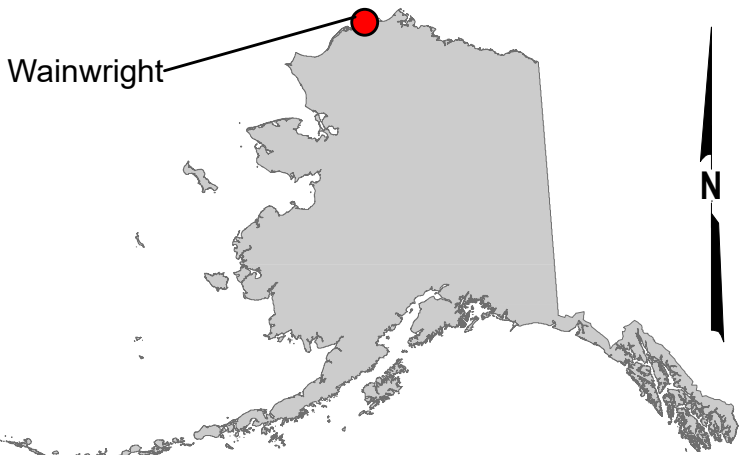
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Alaska Department of Environmental Conservation, October 2018 18 AAC 75.341 Table A2 Method One – Petroleum Hydrocarbon Soil Cleanup Levels in the Arctic Zone and Table B1 Method Two – Arctic Zone.

Alaska Department of Environmental Conservation, September 2018, 18 AAC 78: Underground Storage Tanks: Juneau, Alaska, available: <http://dec.alaska.gov/commish/regulations/>.

Agviq, LLC (Agviq) NSB Wainwright Washeteria Site Characterization Report 2016 Activities, November 3, 2017

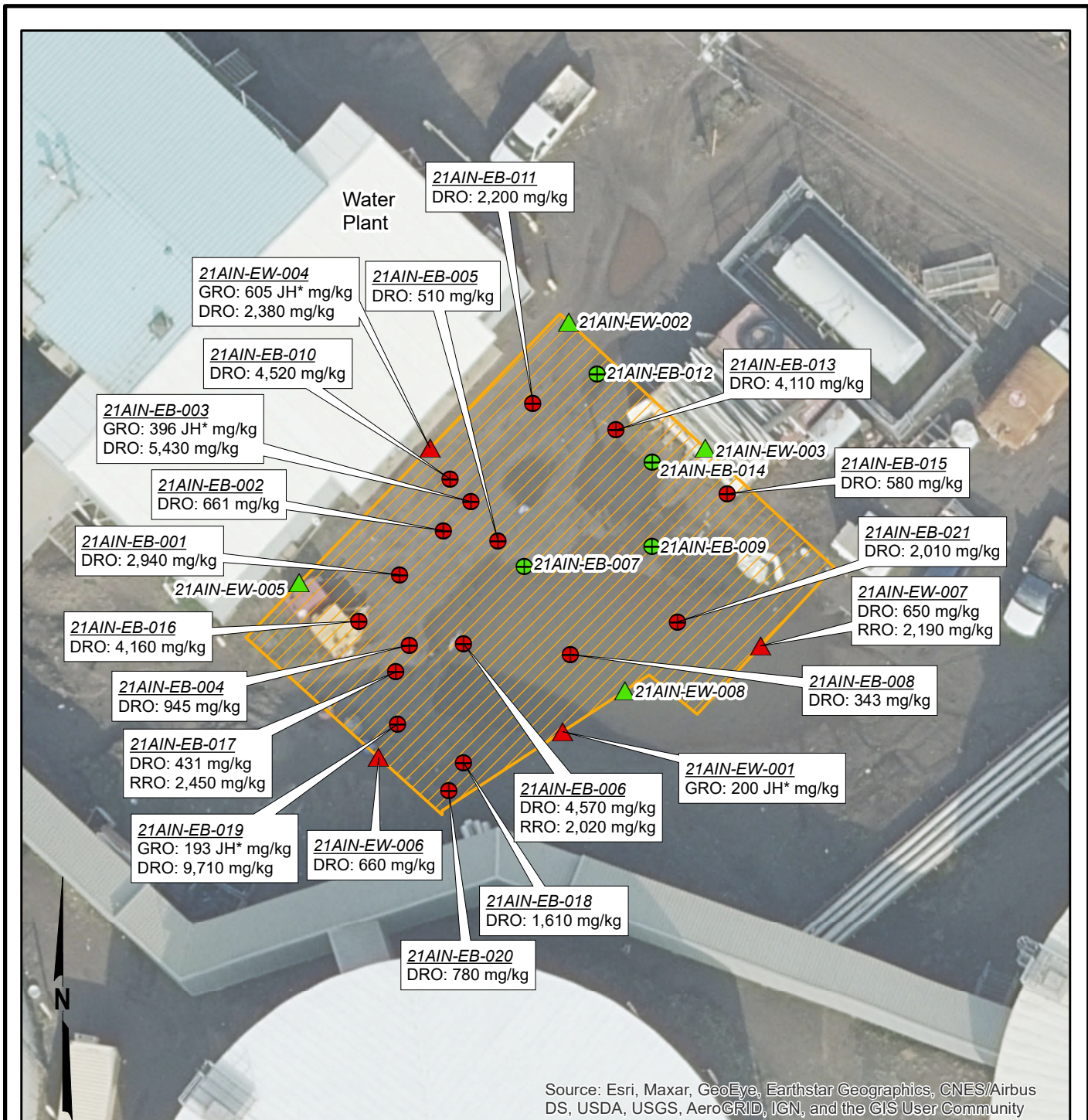


AIN Water Treatment Plant Upgrade
 Site Visit 2 Summary Report
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Site Vicinity

October 2021

105401-003



LEGEND

Sidewall Sample Location

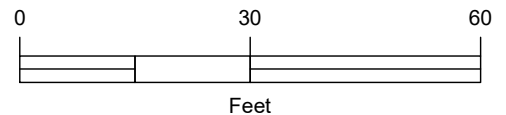
- Analyte Concentrations Exceed ADEC Cleanup Levels
- Analyte Concentrations Do Not Exceed ADEC Cleanup Levels

Eastern Expansion Area Excavation

Base of Excavation Sample Location

- Analyte Concentrations Exceed ADEC Cleanup Levels
- Analyte Concentrations Do Not Exceed ADEC Cleanup Levels

Acronyms:
mg/kg = milligrams per kilogram
JH* = Estimated result, biased high



AIN Water Treatment Plant Upgrade
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Sample Locations Map

- Notes:
1. Field-screening headdress and analytical soil sample locations are dependent upon site conditions and are not depicted in this figure.
 2. The highest result for a duplicate pair is reported.

October 2021

105401-003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 2

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
WASTE CHARACTERIZATION SAMPLE RESULTS**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-WC-001						
				Primary	Field Duplicate	21AIN-WC-002	21AIN-WC-003	21AIN-WC-004	21AIN-WC-005	21AIN-WC-006
AK101	Gasoline Range Organics	100	mg/Kg	274 JH*	263 JH*	18.7 JH*	80.1 JH*	33.0 JH*	340 JH*	21.0
AK102	Diesel Range Organics	200	mg/Kg	3,310	5,340	490	776	864	5,480	480
AK103	Residual Range Organics	2,000	mg/Kg	270	220 J	104 J	83.5 J	280	527	212
SW8260D (VOCs)	1,1,1,2-Tetrachloroethane	30	mg/kg	<0.0167	<0.0157	<0.0162	<0.0136	<0.0160	<0.0159	<0.0194
	1,1,1-Trichloroethane	360	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	1,1,2,2-Tetrachloroethane	8.8	mg/kg	<0.00167	<0.00157	<0.00161	<0.00136	<0.00161	<0.00159	<0.00194
	1,1,2-Trichloroethane	2.3	mg/kg	<0.000835	<0.000785	<0.000805	<0.000680	<0.000805	<0.000795	<0.000970
	1,1-Dichloroethane	67	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	1,1-Dichloroethene	480	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	1,1-Dichloropropene	—	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	1,2,3-Trichlorobenzene	110	mg/kg	<0.0835	<0.0785	<0.0805	<0.0680	<0.0805	<0.0795	<0.0970
	1,2,3-Trichloropropane	0.089	mg/kg	<0.00167	<0.00157	<0.00161	<0.00136	<0.00161	<0.00159	<0.00194
	1,2,4-Trichlorobenzene	65	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	1,2,4-Trimethylbenzene	43	mg/kg	1.82	2.22	<0.161 B*	0.836	2.62	29.4	0.552 JH*
	1,2-Dibromo-3-chloropropane	—	mg/kg	<0.0835	<0.0785	<0.0805	<0.0680	<0.0805	<0.0795	<0.0970
	1,2-Dibromoethane	0.62	mg/kg	<0.00125	<0.00118	<0.00121	<0.00102	<0.00120	<0.00119	<0.00145
	1,2-Dichlorobenzene	78	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	1,2-Dichloroethane	8	mg/kg	<0.00167	<0.00157	<0.00161	<0.00136	<0.00161	<0.00159	<0.00194
	1,2-Dichloropropane	25	mg/kg	<0.00835	<0.00785	<0.00805	<0.00680	<0.00805	<0.00795	<0.00970
	1,3,5-Trimethylbenzene	37	mg/kg	2.87	3.02	0.354	1.55	1.31	11.6	0.357
	1,3-Dichlorobenzene	62	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	1,3-Dichloropropane	—	mg/kg	<0.00835	<0.00785	<0.00805	<0.00680	<0.00805	<0.00795	<0.00970
	1,4-Dichlorobenzene	31	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	2,2-Dichloropropane	—	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	2-Butanone (MEK)	23,000	mg/kg	<0.208	<0.196	<0.202	<0.170	<0.201	<0.198	<0.242
	2-Chlorotoluene	—	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	2-Hexanone	380	mg/kg	<0.100	<0.0940	<0.0970	<0.0815	<0.0965	<0.0950	<0.117
	4-Chlorotoluene	—	mg/kg	<0.0167	<0.0157	<0.0162	<0.0136	<0.0160	<0.0159	<0.0194
	Acetone	100,000	mg/kg	<0.208	<0.196	<0.202	<0.170	0.217 J	<0.198	<0.242
	Benzene	16	mg/kg	0.0104 J	0.0118 J	0.0109 J	0.0176	0.0112 J	0.104	<0.0121
	Bromobenzene	160	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	Bromochloromethane	—	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	Bromodichloromethane	5.3	mg/kg	<0.00167	<0.00157	<0.00161	<0.00136	<0.00161	<0.00159	<0.00194
Bromoform	340	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242	
Bromomethane	15	mg/kg	<0.0167	<0.0157	<0.0162	<0.0136	<0.0160	<0.0159	<0.0194	
Carbon disulfide	500	mg/kg	<0.0835	<0.0785	<0.0805	<0.0680	<0.0805	<0.0795	<0.0970	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
WASTE CHARACTERIZATION SAMPLE RESULTS**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-WC-001						
				Primary	Field Duplicate	21AIN-WC-002	21AIN-WC-003	21AIN-WC-004	21AIN-WC-005	21AIN-WC-006
SW8260D (VOCs)	Carbon tetrachloride	13	mg/kg	<0.0104	<0.00980	<0.0101	<0.00845	<0.0101	<0.00990	<0.0121
	Chlorobenzene	180	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	Chloroethane	1,400	mg/kg	<0.167	0.111 J	0.162 J	0.232 J	0.126 J	0.282 J	<0.194
	Chloroform	5.8	mg/kg	<0.00500	<0.00471	<0.00484	<0.00407	<0.00482	<0.00475	<0.00580
	Chloromethane	250	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	cis-1,2-Dichloroethene	270	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	cis-1,3-Dichloropropene	—	mg/kg	<0.0104	<0.00980	<0.0101	<0.00845	<0.0101	<0.00990	<0.0121
	Dibromochloromethane	140	mg/kg	<0.00417	<0.00392	<0.00403	<0.00339	<0.00402	<0.00396	<0.00485
	Dibromomethane	45	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	Dichlorodifluoromethane	220	mg/kg	0.451 J*	0.206 J*	0.745	1.37	0.545	<0.0795	0.0833 J
	Ethylbenzene	72	mg/kg	0.0917 JH*	0.106 JH*	<0.0403 B*	<0.0647 B*	0.202	3.04	<0.0552 B*
	Hexachlorobutadiene	3.3	mg/kg	<0.0167	<0.0157	<0.0162	<0.0136	<0.0160	<0.0159	<0.0194
	Isopropylbenzene	54	mg/kg	0.0775	0.0981	<0.0202	0.0285 J	0.137	1.20	0.0426 J
	m,p-xylenes	57	mg/kg	0.777	1.04	<0.0806 B*	<0.171 B*	1.13	14.5	<0.143 B*
	Methyl isobutyl ketone	2,200	mg/kg	<0.208	<0.196	<0.202	<0.170	<0.201	<0.198	<0.242
	Methylene chloride	630	mg/kg	<0.0835	<0.0785	<0.0805	<0.0680	<0.0805	<0.0795	<0.0970
	Methyl-t-butyl ether (MTBE)	970	mg/kg	<0.0835	<0.0785	<0.0805	<0.0680	<0.0805	<0.0795	<0.0970
	Naphthalene	42	mg/kg	1.19 J*	2.01 J*	0.156	0.430	2.22	31.6	0.487
	n-Butylbenzene	20	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	n-Propylbenzene	52	mg/kg	0.105 JH*	0.131	<0.0403 B*	<0.0522 B*	0.286	1.88	0.0925
	o-Xylene	57	mg/kg	0.905	1.01	<0.0597 B*	0.249 JH*	0.726	11.1	<0.0940 B*
	p-Isopropyltoluene	—	mg/kg	0.306	0.437	<0.0645	0.955	0.282	1.21	0.100 J
	sec-Butylbenzene	28	mg/kg	0.161	0.188	<0.0202	0.0776	0.245	1.24	0.0659
	Styrene	180	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	tert-Butylbenzene	35	mg/kg	0.0488	0.0510	<0.0202	0.0315 J	0.0233 J	0.121	<0.0242
	Tetrachloroethene	68	mg/kg	<0.0104	<0.00980	0.00847 J	<0.00845	<0.0101	<0.00990	<0.0121
	Toluene	200	mg/kg	0.108 JH*	0.102 JH*	<0.0403 B*	0.0722 JH*	0.344	2.49	<0.0484 B*
	Total Xylenes	57	mg/kg	1.68	2.06	<0.121 B*	0.420 JH*	1.86	25.6	<0.237 B*
	trans-1,2-Dichloroethene	960	mg/kg	<0.0209	<0.0196	<0.0202	<0.0170	<0.0201	<0.0198	<0.0242
	trans-1,3-Dichloropropene	29	mg/kg	<0.0104	<0.00980	<0.0101	<0.00845	<0.0101	<0.00990	<0.0121
	Trichloroethene	7.1	mg/kg	0.0113 J	0.0169	0.0129 J	0.00711 J	0.00522 J	<0.00795	<0.00970
	Trichlorofluoromethane	980	mg/kg	<0.0417	<0.0393	<0.0403	0.174	<0.0401	<0.0396	<0.0485
Trichlorotrifluoroethane	740	mg/kg	<0.0835	<0.0785	<0.0805	<0.0680	<0.0805	<0.0795	<0.0970	
Vinyl acetate	2,100	mg/kg	<0.0835	<0.0785	<0.0805	<0.0680	<0.0805	<0.0795	<0.0970	
Vinyl chloride	0.69	mg/kg	<0.000665	<0.000630	<0.000645	<0.000540	<0.000645	<0.000635	<0.000775	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
WASTE CHARACTERIZATION SAMPLE RESULTS**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-WC-001						
				Primary	Field Duplicate	21AIN-WC-002	21AIN-WC-003	21AIN-WC-004	21AIN-WC-005	21AIN-WC-006
8270D-SIM (PAHs)	1-Methylnaphthalene	68	mg/kg	6.03 JH*	2.11 J*	0.342 JH*	0.541	2.85	26.5 JH*	2.38 JH*
	2-Methylnaphthalene	420	mg/kg	3.03 JH*	0.261 J*	0.0862 JH*	0.242	2.55	41.2 JH*	2.74 JH*
	Acenaphthene	6,300	mg/kg	0.407 JH*	0.255	<0.0136	0.0311	0.0853	0.566 JH*	<0.0142
	Acenaphthylene	3,100	mg/kg	<0.0138	<0.0139	<0.0136	<0.0134	<0.0149	<0.0146	<0.0142
	Anthracene	31,000	mg/kg	0.117 JH*	0.0738	<0.0136	<0.0134	0.0192 J	0.173 JH*	<0.0142
	Benzo(a)anthracene	20	mg/kg	0.108 J*	0.0620 J*	<0.0136	<0.0134	0.0169 J	0.188	<0.0142
	Benzo(a)pyrene	2	mg/kg	0.0279 J*	0.0162 J*	<0.0136	<0.0134	<0.0149	0.0541	<0.0142
	Benzo(b)fluoranthene	20	mg/kg	0.0637 J*	0.0377 J*	<0.0136	<0.0134	0.0122 J	0.155	<0.0142
	Benzo(g,h,i)perylene	3,100	mg/kg	0.00733 J	<0.0139	<0.0136	<0.0134	<0.0149	0.0152 J	<0.0142
	Benzo(k)fluoranthene	200	mg/kg	0.0166 J	0.00999J	<0.0136	<0.0134	<0.0149	0.0475	<0.0142
	Chrysene	2,000	mg/kg	0.0851 J*	0.0505 J*	<0.0136	0.00771 J	0.0165 J	0.268	0.0105 J
	Dibenzo(a,h)anthracene	2	mg/kg	<0.0138	<0.0139	<0.0136	<0.0134	<0.0149	0.00749 J	<0.0142
	Fluoranthene	4,200	mg/kg	0.552 J*	0.313 J*	0.0117 J	0.0112 J	0.0754	1.01	0.0137 J
	Fluorene	4,200	mg/kg	0.432 JH*	0.267	0.0346 JH*	0.0461	0.108	0.888 JH*	0.0759 JH*
	Indeno(1,2,3-cd)pyrene	20	mg/kg	0.00778 J	<0.0139	<0.0136	<0.0134	<0.0149	0.0164 J	<0.0142
	Naphthalene	42	mg/kg	<0.0111 J*	0.427 J*	0.104 JH*	0.140	0.600	24.1 JH*	0.987 JH*
	Phenanthrene	3,100	mg/kg	1.22 JH*	0.500 J*	0.0185 JH*	0.0221 J	0.146	1.33 JH*	0.0353 JH*
Pyrene	3,100	mg/kg	0.348 J*	0.203 J*	0.00939 J	0.0110 J	0.0499	0.582	0.0119 J	

Notes: Results reported from SGS North America, Inc. work order 1215216.
 Regulatory limits from 18 AAC 75.341 Table A2 Method One - Petroleum Hydrocarbon Soil Cleanup Levels in the Arctic Zone and Table B1 Method Two - Arctic Zone Cleanup Levels (Human Health).
 DEC Alaska Department of Environmental Conservation
 PAHs polynuclear aromatic hydrocarbons
 VOCs volatile organic compounds
 mg/kg milligrams per kilogram
 — No applicable regulatory limit exists for the associated analyte.
 < Analyte was not detected; reported as <LOD.
Bold The detected concentration exceeds the regulatory limit for the associated analyte.
 J Estimated concentration, detected greater than the detection limit (DL) and less than the limit of quantitation (LOQ). Flag applied by the laboratory.
 B* Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc. (*)
 J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)
 JH* Estimated concentration, biased high due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
OFFSITE STOCKPILE RESULTS SUMMARY**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-STKPL-002			
				21AIN-STKPL-001	Primary	Duplicate	21AIN-STKPL-003
AK101	Gasoline Range Organics	100	mg/Kg	<4.03 B*	14.0 J*	7.87 JH*	<3.77 B*
AK102	Diesel Range Organics	200	mg/Kg	78.5	455	468	21.6
AK103	Residual Range Organics	2,000	mg/Kg	97.9 J	107 J	98.0 J	50.7 J
SW8260D (VOCs)	1,1,1,2-Tetrachloroethane	30	mg/kg	<0.0146	<0.0188	<0.0165	<0.0151
	1,1,1-Trichloroethane	360	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	1,1,2,2-Tetrachloroethane	8.8	mg/kg	<0.00146	<0.00189	<0.00165	<0.00151
	1,1,2-Trichloroethane	2.3	mg/kg	<0.000730	<0.000940	<0.000825	<0.000755
	1,1-Dichloroethane	67	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	1,1-Dichloroethene	480	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	1,1-Dichloropropene	—	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	1,2,3-Trichlorobenzene	110	mg/kg	<0.0730	<0.0940	<0.0825	<0.0755
	1,2,3-Trichloropropane	0.089	mg/kg	<0.00146	<0.00189	<0.00165	<0.00151
	1,2,4-Trichlorobenzene	65	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	1,2,4-Trimethylbenzene	43	mg/kg	<0.0730	3.50 J*	1.75 J*	<0.0755
	1,2-Dibromo-3-chloropropane	—	mg/kg	<0.0730	<0.0940	<0.0825	<0.0755
	1,2-Dibromoethane	0.62	mg/kg	<0.00110	<0.00142	<0.00124	<0.00113
	1,2-Dichlorobenzene	78	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	1,2-Dichloroethane	8	mg/kg	<0.00146	<0.00189	<0.00165	<0.00151
	1,2-Dichloropropane	25	mg/kg	<0.00730	<0.00940	<0.00825	<0.00755
	1,3,5-Trimethylbenzene	37	mg/kg	<0.0182	1.70 J*	0.858 J*	<0.0188
	1,3-Dichlorobenzene	62	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	1,3-Dichloropropane	—	mg/kg	<0.00730	<0.00940	<0.00825	<0.00755
	1,4-Dichlorobenzene	31	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	2,2-Dichloropropane	—	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	2-Butanone (MEK)	23000	mg/kg	<0.183	<0.235	<0.206	<0.189
	2-Chlorotoluene	—	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	2-Hexanone	380	mg/kg	<0.0875	<0.113	<0.0990	<0.0905
	4-Chlorotoluene	—	mg/kg	<0.0146	<0.0188	<0.0165	<0.0151
	Acetone	100000	mg/kg	<0.183	<0.235	<0.206	<0.189
	Benzene	16	mg/kg	<0.00910	0.00801 J	0.00865 J	<0.00945
	Bromobenzene	160	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	Bromochloromethane	—	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	Bromodichloromethane	5.3	mg/kg	<0.00146	<0.00189	<0.00165	<0.00151
	Bromoform	340	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	Bromomethane	15	mg/kg	<0.0146	<0.0188	<0.0165	<0.0151
	Carbon disulfide	500	mg/kg	<0.0730	<0.0940	<0.0825	<0.0755
	Carbon tetrachloride	13	mg/kg	<0.00910	<0.0118	<0.0103	<0.00945
	Chlorobenzene	180	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	Chloroethane	1400	mg/kg	3.59	<0.189	<0.165	0.674
	Chloroform	5.8	mg/kg	<0.00438	<0.00565	<0.00494	<0.00453
	Chloromethane	250	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	cis-1,2-Dichloroethene	270	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	cis-1,3-Dichloropropene	—	mg/kg	<0.00910	<0.0118	<0.0103	<0.00945
	Dibromochloromethane	140	mg/kg	<0.00365	<0.00471	<0.00412	<0.00378
	Dibromomethane	45	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188
	Dichlorodifluoromethane	220	mg/kg	3.87	0.0862 J	0.0692 J	5.28
	Ethylbenzene	72	mg/kg	<0.0182	0.0306 J	0.0227 J	<0.0188
	Hexachlorobutadiene	3.3	mg/kg	<0.0146	<0.0188	<0.0165	<0.0151
	Isopropylbenzene	54	mg/kg	<0.0182	0.0664 J*	0.0338 J*	<0.0188
	m,p-xylenes	57	mg/kg	<0.0365	0.0608 J	0.0445 J	<0.0377
Methyl isobutyl ketone	2200	mg/kg	<0.183	<0.235	<0.206	<0.189	
Methylene chloride	630	mg/kg	<0.0730	<0.0940	<0.0825	<0.0755	
Methyl-t-butyl ether (MTBE)	970	mg/kg	<0.0730	<0.0940	<0.0825	<0.0755	
Naphthalene	42	mg/kg	0.0226 J	0.948	0.616	<0.0188	
n-Butylbenzene	20	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188	
n-Propylbenzene	52	mg/kg	<0.0182	0.185 J*	0.0874 J*	<0.0188	
o-Xylene	57	mg/kg	<0.0182	0.0358 J	0.0251 J	<0.0188	
p-Isopropyltoluene	—	mg/kg	<0.0585	0.311 J*	0.131 J*	<0.0605	
sec-Butylbenzene	28	mg/kg	<0.0182	0.132 J*	0.0754 J*	<0.0188	
Styrene	180	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188	
tert-Butylbenzene	35	mg/kg	<0.0182	0.0287 J*	0.0161 J*	<0.0188	
Tetrachloroethene	68	mg/kg	<0.00910	<0.0118	<0.0103	<0.00945	
Toluene	200	mg/kg	<0.0182	0.0250 J	0.0342 J	<0.0188	
Total Xylenes	57	mg/kg	<0.0545	0.0966 J	0.0696 J	<0.0565	
trans-1,2-Dichloroethene	960	mg/kg	<0.0182	<0.0236	<0.0206	<0.0188	
trans-1,3-Dichloropropene	29	mg/kg	<0.00910	<0.0118	<0.0103	<0.00945	
Trichloroethene	7.1	mg/kg	<0.00730	<0.00940	<0.00825	<0.00755	
Trichlorofluoromethane	980	mg/kg	<0.0365	<0.0471	<0.0412	<0.0377	
Trichlorotrifluoroethane	740	mg/kg	<0.0730	<0.0940	<0.0825	<0.0755	
Vinyl acetate	2100	mg/kg	<0.0730	<0.0940	<0.0825	<0.0755	
Vinyl chloride	0.69	mg/kg	<0.000585	<0.000755	<0.000660	<0.000605	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
OFFSITE STOCKPILE RESULTS SUMMARY**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-STKPL-002			
				21AIN-STKPL-001	Primary	Duplicate	21AIN-STKPL-003
8270D-SIM (PAHs)	1-Methylnaphthalene	68	mg/kg	0.0407	1.34	0.810	0.0255 J
	2-Methylnaphthalene	420	mg/kg	0.0361	1.17 J*	0.583 J*	0.0319
	Acenaphthene	6300	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Acenaphthylene	3100	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Anthracene	31000	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Benzo(a)anthracene	20	mg/kg	<0.0140	<0.0144	<0.0141	0.00689 J
	Benzo(a)pyrene	2	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Benzo(b)fluoranthene	20	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Benzo(g,h,i)perylene	3100	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Benzo(k)fluoranthene	200	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Chrysene	2000	mg/kg	<0.0140	0.00983 J	<0.0141	<0.0134
	Dibenzo(a,h)anthracene	2	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Fluoranthene	4200	mg/kg	0.0120 J	0.0151 J	0.0113 J	0.0165 J
	Fluorene	4200	mg/kg	<0.0140	0.0307	0.0249 J	<0.0134
	Indeno(1,2,3-cd)pyrene	20	mg/kg	<0.0140	<0.0144	<0.0141	<0.0134
	Naphthalene	42	mg/kg	0.0220 J	0.275	0.224	0.0138 J
	Phenanthrene	3100	mg/kg	0.0163 J	0.0263 J	0.0194 J	0.0220 J
	Pyrene	3100	mg/kg	0.0116 J	0.0159 J	0.0116 J	0.0158 J

Notes: Results reported from SGS North America, Inc. work order 1215266.

Regulatory limits from 18 AAC 75.341 Table A2 Method One - Petroleum Hydrocarbon Soil Cleanup Levels in the Arctic Zone and Table B1 Method Two - Arctic Zone Cleanup Levels (Human Health).

DEC Alaska Department of Environmental Conservation

PAHs polynuclear aromatic hydrocarbons

VOCs volatile organic compounds

mg/kg milligrams per kilogram

— No applicable regulatory limit exists for the associated analyte.

< Analyte was not detected; reported as <LOD.

Bold The detected concentration exceeds the regulatory limit for the associated analyte.

J Estimated concentration, detected greater than the detection limit (DL) and less than the limit of quantitation (LOQ). Flag applied by the laboratory.

B* Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc. (*)

J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)

JH* Estimated concentration, biased high due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-EB-003							
				21AIN-EB-001	21AIN-EB-002	Primary	Duplicate	21AIN-EB-004	21AIN-EB-005	21AIN-EB-006	21AIN-EB-007
AK101	Gasoline Range Organics	100	mg/Kg	39.4 JH*	19.8 JH*	366 JH*	396 JH*	37.3	80.3 JH*	34.1	21.4
AK102	Diesel Range Organics	200	mg/Kg	2,940	661	4,380	5,430	945	510	4,570	139
AK103	Residual Range Organics	2,000	mg/Kg	91.3 J	97.9 J	87.2 J	125	1,430	557	2,020	234
SW8260D (VOCs)	1,1,1,2-Tetrachloroethane	30	mg/kg	<0.0163	<0.0144	<0.0185	<0.0180	<0.0473	<0.0191	<0.0314	<0.0222
	1,1,1-Trichloroethane	360	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	1,1,2,2-Tetrachloroethane	8.8	mg/kg	<0.00163	<0.00145	<0.00185	<0.00180	<0.00473	<0.00191	<0.00314	<0.00222
	1,1,2-Trichloroethane	2.3	mg/kg	<0.000815	<0.000720	<0.000925	<0.000900	<0.00236	<0.000955	<0.00157	<0.00111
	1,1-Dichloroethane	67	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	1,1-Dichloroethene	480	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	1,1-Dichloropropene	—	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	1,2,3-Trichlorobenzene	110	mg/kg	<0.0815	<0.0720	<0.0925	<0.0900	<0.236	<0.0955	<0.157	<0.111
	1,2,3-Trichloropropane	0.089	mg/kg	<0.00163	<0.00145	<0.00185	<0.00180	<0.00473	<0.00191	<0.00314	<0.00222
	1,2,4-Trichlorobenzene	65	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	1,2,4-Trimethylbenzene	43	mg/kg	<0.0815	0.785	36.3	42.9	2.20	10.5	4.31	0.952
	1,2-Dibromo-3-chloropropane	—	mg/kg	<0.0815	<0.0720	<0.0925	<0.0900	<0.236	<0.0955	<0.157	<0.111
	1,2-Dibromoethane	0.62	mg/kg	<0.00123	<0.00109	<0.00138	<0.00135	<0.00355	<0.00143	<0.00235	<0.00166
	1,2-Dichlorobenzene	78	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	1,2-Dichloroethane	8	mg/kg	<0.00163	<0.00145	<0.00185	<0.00180	<0.00473	<0.00191	<0.00314	<0.00222
	1,2-Dichloropropane	25	mg/kg	<0.00815	<0.00720	<0.00925	<0.00900	<0.0236	<0.00955	<0.0157	<0.0111
	1,3,5-Trimethylbenzene	37	mg/kg	0.813	1.12	12.2	15.2	0.828	3.29	2.37	0.617
	1,3-Dichlorobenzene	62	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	1,3-Dichloropropane	—	mg/kg	<0.00815	<0.00720	<0.00925	<0.00900	<0.0236	<0.00955	<0.0157	<0.0111
	1,4-Dichlorobenzene	31	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	2,2-Dichloropropane	—	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	2-Butanone (MEK)	23000	mg/kg	<0.204	<0.180	<0.231	<0.225	0.379 J	<0.238	<0.393	<0.277
	2-Chlorotoluene	—	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	2-Hexanone	380	mg/kg	<0.0980	<0.0865	<0.111	<0.108	<0.283	<0.115	<0.189	<0.133
	4-Chlorotoluene	—	mg/kg	<0.0163	<0.0144	<0.0185	<0.0180	<0.0473	<0.0191	<0.0314	<0.0222
	Acetone	100000	mg/kg	<0.204	<0.180	<0.231	<0.225	1.34	<0.238	<0.393	<0.277
	Benzene	16	mg/kg	<0.0102	0.0242	0.0846	0.0856	0.204	<0.0119	0.0353 J	<0.0138
	Bromobenzene	160	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	Bromochloromethane	—	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	Bromodichloromethane	5.3	mg/kg	<0.00163	<0.00145	<0.00185	<0.00180	<0.00473	<0.00191	<0.00314	<0.00222
	Bromoform	340	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	Bromomethane	15	mg/kg	<0.0163	<0.0144	<0.0185	<0.0180	<0.0473	<0.0191	<0.0314	<0.0222
	Carbon disulfide	500	mg/kg	<0.0815	<0.0720	<0.0925	<0.0900	<0.236	<0.0955	<0.157	<0.111
Carbon tetrachloride	13	mg/kg	<0.0102	<0.00900	<0.0116	<0.0113	<0.0296	<0.0119	<0.0196	<0.0138	
Chlorobenzene	180	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277	
Chloroethane	1400	mg/kg	0.359	0.205 J	<0.185	<0.180	<0.472	<0.191	<0.314	<0.222	
Chloroform	5.8	mg/kg	<0.00490	<0.00433	<0.00555	<0.00540	<0.0141	<0.00570	<0.00940	<0.00665	
Chloromethane	250	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277	
cis-1,2-Dichloroethene	270	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277	
cis-1,3-Dichloropropene	—	mg/kg	<0.0102	<0.00900	<0.0116	<0.0113	<0.0296	<0.0119	<0.0196	<0.0138	
Dibromochloromethane	140	mg/kg	<0.00408	<0.00361	<0.00462	<0.00451	<0.0118	<0.00477	<0.00785	<0.00555	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-EB-003							
				21AIN-EB-001	21AIN-EB-002	Primary	Duplicate	21AIN-EB-004	21AIN-EB-005	21AIN-EB-006	21AIN-EB-007
SW8260D (VOCs)	Dibromomethane	45	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	Dichlorodifluoromethane	220	mg/kg	1.43	0.721	<0.0925	<0.0900	<0.236	<0.0955	<0.157	<0.111
	Ethylbenzene	72	mg/kg	<0.0204	0.0740	2.77	4.00	0.219	0.439	0.356	0.0332 J
	Hexachlorobutadiene	3.3	mg/kg	<0.0163	<0.0144	<0.0185	<0.0180	<0.0473	<0.0191	<0.0314	<0.0222
	Isopropylbenzene	54	mg/kg	<0.0204	0.0469	1.54	2.14	0.112 J	0.326	0.181	0.0288 J
	m,p-xylenes	57	mg/kg	<0.0408	0.151	18.0	22.3	1.10	3.54	2.07	0.259
	Methyl isobutyl ketone	2200	mg/kg	<0.204	<0.180	<0.231	<0.225	<0.590	<0.238	<0.393	<0.277
	Methylene chloride	630	mg/kg	<0.0815	<0.0720	<0.0925	<0.0900	<0.236	<0.0955	<0.157	<0.111
	Methyl-t-butyl ether (MTBE)	970	mg/kg	<0.0815	<0.0720	<0.0925	<0.0900	<0.236	<0.0955	<0.157	<0.111
	Naphthalene	42	mg/kg	0.574	1.14	28.6	36.2	1.72	9.40	4.81	0.858
	n-Butylbenzene	20	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	n-Propylbenzene	52	mg/kg	<0.0204	0.147	2.68	3.41	0.256	0.686	0.344	0.0682
	o-Xylene	57	mg/kg	0.0583	0.0762	9.37	11.7	0.490	2.13	1.72	0.165
	p-Isopropyltoluene	—	mg/kg	<0.0655	0.103 J	1.74	2.06	0.201 J	0.583	0.414	<0.0885
	sec-Butylbenzene	28	mg/kg	<0.0204	0.0697	1.85	2.32	0.163	0.570	0.236	0.0615
	Styrene	180	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	tert-Butylbenzene	35	mg/kg	<0.0204	<0.0181	0.131	0.166	<0.0590	0.0543	0.0377 J	<0.0277
	Tetrachloroethene	68	mg/kg	<0.0102	<0.00900	<0.0116	<0.0113	<0.0296	<0.0119	<0.0196	<0.0138
	Toluene	200	mg/kg	0.0367 J	0.0227 J	1.82	2.56	4.97	0.295	0.491	0.983
	Total Xylenes	57	mg/kg	0.0583 J	0.227	27.4	34.0	1.59	5.67	3.79	0.424
	trans-1,2-Dichloroethene	960	mg/kg	<0.0204	<0.0181	<0.0231	<0.0225	<0.0590	<0.0238	<0.0393	<0.0277
	trans-1,3-Dichloropropene	29	mg/kg	<0.0102	<0.00900	<0.0116	<0.0113	<0.0296	<0.0119	<0.0196	<0.0138
	Trichloroethene	7.1	mg/kg	0.00734J	0.0155	<0.00925	<0.00900	<0.0236	<0.00955	0.0110J	<0.0111
	Trichlorofluoromethane	980	mg/kg	<0.0408	<0.0361	<0.0462	<0.0451	<0.118	<0.0476	<0.0785	<0.0555
	Trichlorotrifluoroethane	740	mg/kg	<0.0815	<0.0720	<0.0925	<0.0900	<0.236	<0.0955	<0.157	<0.111
	Vinyl acetate	2100	mg/kg	<0.0815	<0.0720	<0.0925	<0.0900	<0.236	<0.0955	<0.157	<0.111
	Vinyl chloride	0.69	mg/kg	<0.000655	<0.000580	<0.000740	<0.000720	<0.00189	<0.000760	<0.00126	<0.000885
	SW8270D- SIM (PAHs)	1-Methylnaphthalene	68	mg/kg	4.43	3.76	15.5 JH*	18.0	2.72	2.38	24.7	0.338
2-Methylnaphthalene		420	mg/kg	0.115	4.62	31.4 JH*	30.4	3.92	3.67	24.4	0.468
Acenaphthene		6300	mg/kg	0.107	0.0401	0.111 JH*	0.120	<0.0196	0.152	0.220	0.00817 J
Acenaphthylene		3100	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	<0.0154	<0.0216	<0.0149
Anthracene		31000	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	0.0455	<0.0216	<0.0149
Benzo(a)anthracene		20	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	0.0288 J	<0.0216	<0.0149
Benzo(a)pyrene		2	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	<0.0154	<0.0216	<0.0149
Benzo(b)fluoranthene		20	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	0.0148 J	<0.0216	<0.0149
Benzo(g,h,i)perylene		3100	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	<0.0154	<0.0216	<0.0149
Benzo(k)fluoranthene		200	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	<0.0154	<0.0216	<0.0149
Chrysene		2000	mg/kg	0.00816 J	0.00947 J	<0.0149	<0.0150	<0.0196	0.0226 J	<0.0216	<0.0149
Dibenzo(a,h)anthracene		2	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	<0.0154	<0.0216	<0.0149
Fluoranthene		4200	mg/kg	0.0207 J	0.0180 J	0.0406	0.0426	<0.0196	0.158	0.0220 J	<0.0149
Fluorene		4200	mg/kg	0.127	0.0701	0.147 JH*	0.175	0.0413	0.173	0.333	0.0130 J
Indeno(1,2,3-cd)pyrene		20	mg/kg	<0.0147	<0.0149	<0.0149	<0.0150	<0.0196	<0.0154	<0.0216	<0.0149
Naphthalene		42	mg/kg	0.386	1.44	23.7 JH*	22.6	2.29	2.11	8.00	0.202
Phenanthrene		3100	mg/kg	<0.0147	0.0392	0.0849 JH*	0.107	<0.0196	0.347	0.141	0.0140 J
Pyrene		3100	mg/kg	0.0199 J	0.0156 J	0.0276 J	0.0287 J	<0.0196	0.0965	0.0179 J	<0.0149

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-EB-008	21AIN-EB-009	21AIN-EB-010	21AIN-EB-011	21AIN-EB-012	21AIN-EB-013	21AIN-EB-014	21AIN-EB-015
AK101	Gasoline Range Organics	100	mg/Kg	11.3 JH*	<4.61 B*	111 JH*	36.9 JH*	<3.55 B*	357 JH*	<4.23 B*	16.7 JH*
AK102	Diesel Range Organics	200	mg/Kg	343	41.9	4,520	2,200	14.9 J	4,110	<12.4	580
AK103	Residual Range Organics	2,000	mg/Kg	1,130	244	1,040	54.7 J	<56.0	<240	<62.0	200
SW8260D (VOCs)	1,1,1,2-Tetrachloroethane	30	mg/kg	<0.0231	<0.0185	<0.0290	<0.0176	<0.0142	<0.0925	<0.0169	<0.0176
	1,1,1-Trichloroethane	360	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	1,1,2,2-Tetrachloroethane	8.8	mg/kg	<0.00231	<0.00185	<0.00290	<0.00177	<0.00142	<0.00925	<0.00169	<0.00177
	1,1,2-Trichloroethane	2.3	mg/kg	<0.00116	<0.000920	<0.00145	<0.000885	<0.000710	<0.00462	<0.000845	<0.000880
	1,1-Dichloroethane	67	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	1,1-Dichloroethene	480	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	1,1-Dichloropropene	—	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	1,2,3-Trichlorobenzene	110	mg/kg	<0.116	<0.0920	<0.145	<0.0885	<0.0710	<0.463	<0.0845	<0.0880
	1,2,3-Trichloropropane	0.089	mg/kg	<0.00231	<0.00185	<0.00290	<0.00177	<0.00142	<0.00925	<0.00169	<0.00177
	1,2,4-Trichlorobenzene	65	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	1,2,4-Trimethylbenzene	43	mg/kg	0.564	0.0678 J	8.72	0.514	<0.0710	37.0	0.444	0.396
	1,2-Dibromo-3-chloropropane	—	mg/kg	<0.116	<0.0920	<0.145	<0.0885	<0.0710	<0.463	<0.0845	<0.0880
	1,2-Dibromoethane	0.62	mg/kg	<0.00173	<0.00138	<0.00217	<0.00133	<0.00107	<0.00695	<0.00127	<0.00132
	1,2-Dichlorobenzene	78	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	1,2-Dichloroethane	8	mg/kg	<0.00231	<0.00185	0.0109	<0.00177	<0.00142	<0.00925	<0.00169	<0.00177
	1,2-Dichloropropane	25	mg/kg	<0.0116	<0.00920	<0.0145	<0.00885	<0.00710	<0.0462	<0.00845	<0.00880
	1,3,5-Trimethylbenzene	37	mg/kg	0.205	0.0244 J	3.32	0.619	<0.0177	15.7	0.223	0.206
	1,3-Dichlorobenzene	62	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	1,3-Dichloropropane	—	mg/kg	<0.0116	<0.00920	<0.0145	<0.00885	<0.00710	<0.0462	<0.00845	<0.00880
	1,4-Dichlorobenzene	31	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	2,2-Dichloropropane	—	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	2-Butanone (MEK)	23000	mg/kg	<0.288	<0.231	<0.362	<0.221	<0.177	<1.16	<0.211	<0.221
	2-Chlorotoluene	—	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	2-Hexanone	380	mg/kg	<0.139	<0.111	<0.174	<0.106	<0.0850	<0.555	<0.102	<0.106
	4-Chlorotoluene	—	mg/kg	<0.0231	<0.0185	<0.0290	<0.0176	<0.0142	<0.0925	<0.0169	<0.0176
	Acetone	100000	mg/kg	<0.288	<0.231	0.591 J	<0.221	<0.177	<1.16	<0.211	<0.221
	Benzene	16	mg/kg	<0.0144	<0.0116	0.656	<0.0111	<0.00890	0.0925 J	<0.0106	0.00838 J
	Bromobenzene	160	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	Bromochloromethane	—	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	Bromodichloromethane	5.3	mg/kg	<0.00231	<0.00185	<0.00290	<0.00177	<0.00142	<0.00925	<0.00169	<0.00177
	Bromoform	340	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	Bromomethane	15	mg/kg	<0.0231	<0.0185	<0.0290	<0.0176	<0.0142	<0.0925	<0.0169	<0.0176
	Carbon disulfide	500	mg/kg	<0.116	<0.0920	<0.145	<0.0885	<0.0710	<0.463	<0.0845	<0.0880
	Carbon tetrachloride	13	mg/kg	<0.0144	<0.0116	<0.0181	<0.0111	<0.00890	<0.0580	<0.0106	<0.0110
Chlorobenzene	180	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221	
Chloroethane	1400	mg/kg	<0.231	<0.185	7.18	<0.176	<0.142	<0.925	<0.169	<0.176	
Chloroform	5.8	mg/kg	<0.00695	<0.00555	<0.00870	<0.00530	<0.00426	<0.0278	<0.00510	<0.00530	
Chloromethane	250	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221	
cis-1,2-Dichloroethene	270	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221	
cis-1,3-Dichloropropene	—	mg/kg	<0.0144	<0.0116	<0.0181	<0.0111	<0.00890	<0.0580	<0.0106	<0.0110	
Dibromochloromethane	140	mg/kg	<0.00575	<0.00461	<0.00725	<0.00441	<0.00355	<0.0232	<0.00423	<0.00441	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-EB-008	21AIN-EB-009	21AIN-EB-010	21AIN-EB-011	21AIN-EB-012	21AIN-EB-013	21AIN-EB-014	21AIN-EB-015
SW8260D (VOCs)	Dibromomethane	45	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	Dichlorodifluoromethane	220	mg/kg	0.125 J	<0.0920	<0.145	<0.0885	1.25	<0.463	<0.0845	<0.0880
	Ethylbenzene	72	mg/kg	0.0398 J	<0.0231	1.30	0.104	<0.0177	0.812	0.0508	0.0423 J
	Hexachlorobutadiene	3.3	mg/kg	<0.0231	<0.0185	<0.0290	<0.0176	<0.0142	<0.0925	<0.0169	<0.0176
	Isopropylbenzene	54	mg/kg	0.0294 J	<0.0231	0.442	0.114	<0.0177	0.206 J	0.0241 J	0.0331 J
	m,p-xylenes	57	mg/kg	0.0710 J	0.0291 J	5.84	0.175	<0.0355	5.33	0.0998	0.157
	Methyl isobutyl ketone	2200	mg/kg	<0.288	<0.231	<0.362	<0.221	<0.177	<1.16	<0.211	<0.221
	Methylene chloride	630	mg/kg	<0.116	<0.0920	<0.145	<0.0885	<0.0710	<0.463	<0.0845	<0.0880
	Methyl-t-butyl ether (MTBE)	970	mg/kg	<0.116	<0.0920	<0.145	<0.0885	<0.0710	<0.463	<0.0845	<0.0880
	Naphthalene	42	mg/kg	0.592	0.0604	6.47	0.353	<0.0177	27.8	0.434	0.238
	n-Butylbenzene	20	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	n-Propylbenzene	52	mg/kg	0.0739	<0.0231	0.821	0.298	<0.0177	0.148 J	0.0541	0.0785
	o-Xylene	57	mg/kg	0.108	<0.0231	3.60	0.0530	<0.0177	8.52	0.0664	0.0771
	p-Isopropyltoluene	—	mg/kg	<0.0925	<0.0740	0.479	0.646	<0.0570	2.85	<0.0675	<0.0705
	sec-Butylbenzene	28	mg/kg	0.0531 J	<0.0231	0.429	1.10	<0.0177	0.932	0.0203 J	0.0525
	Styrene	180	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	tert-Butylbenzene	35	mg/kg	<0.0289	<0.0231	0.0537 J	0.0442	<0.0177	0.254	<0.0211	<0.0221
	Tetrachloroethene	68	mg/kg	<0.0144	<0.0116	<0.0181	<0.0111	<0.00890	<0.0580	<0.0106	<0.0110
	Toluene	200	mg/kg	2.27	0.475	3.14	0.0159 J	<0.0177	<0.116	<0.0211	0.0547
	Total Xylenes	57	mg/kg	0.179	<0.0690	9.43	0.228	<0.0535	13.9	0.166	0.235
	trans-1,2-Dichloroethene	960	mg/kg	<0.0289	<0.0231	<0.0362	<0.0221	<0.0177	<0.116	<0.0211	<0.0221
	trans-1,3-Dichloropropene	29	mg/kg	<0.0144	<0.0116	<0.0181	<0.0111	<0.00890	<0.0580	<0.0106	<0.0110
	Trichloroethene	7.1	mg/kg	<0.0116	<0.00920	<0.0145	<0.00885	<0.00710	<0.0462	<0.00845	<0.00880
	Trichlorofluoromethane	980	mg/kg	<0.0575	<0.0461	<0.0725	<0.0442	<0.0355	<0.232	<0.0423	<0.0441
	Trichlorotrifluoroethane	740	mg/kg	<0.116	<0.0920	<0.145	<0.0885	<0.0710	<0.463	<0.0845	<0.0880
	Vinyl acetate	2100	mg/kg	<0.116	<0.0920	<0.145	<0.0885	<0.0710	<0.463	<0.0845	<0.0880
Vinyl chloride	0.69	mg/kg	<0.000925	<0.000740	<0.00116	<0.000705	<0.000570	<0.00370	<0.000675	<0.000705	
SW8270D- SIM (PAHs)	1-Methylnaphthalene	68	mg/kg	1.17	0.0256 J	17.4 JH*	2.55	0.0141 J	15.9	0.150	2.19
	2-Methylnaphthalene	420	mg/kg	1.46	0.0301	21.1 JH*	5.26	0.0171 J	20.4	0.255	2.89
	Acenaphthene	6300	mg/kg	<0.0660	<0.0150	0.342 JH*	0.0928	<0.0140	0.0787	<0.0154	0.0184 J
	Acenaphthylene	3100	mg/kg	<0.0660	<0.0150	<0.0160	<0.0143	<0.0140	<0.0149	<0.0154	<0.0143
	Anthracene	31000	mg/kg	<0.0660	<0.0150	0.0647 JH*	<0.0143	<0.0140	<0.0149	<0.0154	<0.0143
	Benzo(a)anthracene	20	mg/kg	<0.0660	<0.0150	0.0535	<0.0143	<0.0140	<0.0149	<0.0154	<0.0143
	Benzo(a)pyrene	2	mg/kg	<0.0660	<0.0150	0.0176 J	<0.0143	<0.0140	<0.0149	<0.0154	<0.0143
	Benzo(b)fluoranthene	20	mg/kg	<0.0660	<0.0150	0.0474	<0.0143	0.00743 J	<0.0149	<0.0154	<0.0143
	Benzo(g,h,i)perylene	3100	mg/kg	<0.0660	<0.0150	<0.0160	<0.0143	<0.0140	<0.0149	<0.0154	<0.0143
	Benzo(k)fluoranthene	200	mg/kg	<0.0660	<0.0150	0.0143 J	<0.0143	<0.0140	<0.0149	<0.0154	<0.0143
	Chrysene	2000	mg/kg	<0.0660	<0.0150	0.0792	0.00764 J	<0.0140	<0.0149	<0.0154	<0.0143
	Dibenzo(a,h)anthracene	2	mg/kg	<0.0660	<0.0150	<0.0160	<0.0143	<0.0140	<0.0149	<0.0154	<0.0143
	Fluoranthene	4200	mg/kg	<0.0660	<0.0150	0.313	0.0205 J	0.0133 J	<0.0149	<0.0154	<0.0143
	Fluorene	4200	mg/kg	<0.0660	<0.0150	0.392 JH*	0.157	<0.0140	0.148	<0.0154	0.0662
	Indeno(1,2,3-cd)pyrene	20	mg/kg	<0.0660	<0.0150	<0.0160	<0.0143	<0.0140	<0.0149	<0.0154	<0.0143
	Naphthalene	42	mg/kg	0.605	0.0174 J	7.35 JH*	<0.0114	0.0112 J	16.4	0.336	0.965
	Phenanthrene	3100	mg/kg	<0.0660	<0.0150	0.410 JH*	0.224	0.0147 J	0.0414	<0.0154	0.0130 J
Pyrene	3100	mg/kg	<0.0660	<0.0150	0.240	0.0362	0.0114 J	<0.0149	<0.0154	<0.0143	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-EB-019							
				21AIN-EB-016	21AIN-EB-017	21AIN-EB-018	Primary	Duplicate	21AIN-EB-020	21AIN-EB-021	21AIN-EW-001
AK101	Gasoline Range Organics	100	mg/Kg	369 JH*	10.1 JH*	29.6 JH*	187 JH*	193 JH*	35.7	<4.31 B*	200 JH*
AK102	Diesel Range Organics	200	mg/Kg	4,160	431	1,610	6,640	9,710	780	2,010	5,450
AK103	Residual Range Organics	2,000	mg/Kg	594	2,450	510	1,580	1,530	1,970	474	<233
SW8260D (VOCs)	1,1,1,2-Tetrachloroethane	30	mg/kg	<0.0244	<0.0326	<0.0223	<0.0277	<0.0306	<0.0408	<0.0173	<0.0170
	1,1,1-Trichloroethane	360	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	1,1,2,2-Tetrachloroethane	8.8	mg/kg	<0.00244	<0.00326	<0.00223	<0.00277	<0.00306	<0.00408	<0.00173	<0.00170
	1,1,2-Trichloroethane	2.3	mg/kg	<0.00122	<0.00163	<0.00112	<0.00138	<0.00153	<0.00204	<0.000860	<0.000850
	1,1-Dichloroethane	67	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	1,1-Dichloroethene	480	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	1,1-Dichloropropene	—	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	1,2,3-Trichlorobenzene	110	mg/kg	<0.122	<0.163	<0.112	<0.139	<0.153	<0.204	<0.0860	<0.0850
	1,2,3-Trichloropropane	0.089	mg/kg	<0.00244	<0.00326	<0.00223	<0.00277	<0.00306	<0.00408	<0.00173	<0.00170
	1,2,4-Trichlorobenzene	65	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	1,2,4-Trimethylbenzene	43	mg/kg	2.84	0.107 J	0.948	0.282	0.172 J	2.08	<0.0860	13.0
	1,2-Dibromo-3-chloropropane	—	mg/kg	<0.122	<0.163	<0.112	<0.139	<0.153	<0.204	<0.0860	<0.0850
	1,2-Dibromoethane	0.62	mg/kg	<0.00183	<0.00244	<0.00168	<0.00208	<0.00229	<0.00306	<0.00129	<0.00128
	1,2-Dichlorobenzene	78	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	1,2-Dichloroethane	8	mg/kg	<0.00244	<0.00326	<0.00223	<0.00277	<0.00306	<0.00408	<0.00173	<0.00170
	1,2-Dichloropropane	25	mg/kg	<0.0122	<0.0163	<0.0112	<0.0138	<0.0153	<0.0204	<0.00860	<0.00850
	1,3,5-Trimethylbenzene	37	mg/kg	2.76	0.0863	0.850	2.70	1.65	2.19	0.0237 J	6.50
	1,3-Dichlorobenzene	62	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	1,3-Dichloropropane	—	mg/kg	<0.0122	<0.0163	<0.0112	<0.0138	<0.0153	<0.0204	<0.00860	<0.00850
	1,4-Dichlorobenzene	31	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	2,2-Dichloropropane	—	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	2-Butanone (MEK)	23000	mg/kg	<0.305	0.269 J	<0.279	<0.346	<0.382	0.552 J	<0.216	<0.213
	2-Chlorotoluene	—	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	2-Hexanone	380	mg/kg	<0.146	<0.196	<0.134	<0.167	<0.184	<0.245	<0.103	<0.102
	4-Chlorotoluene	—	mg/kg	<0.0244	<0.0326	<0.0223	<0.0277	<0.0306	<0.0408	<0.0173	<0.0170
	Acetone	100000	mg/kg	0.814	1.20	0.303 J	0.779	0.936	1.97	<0.216	<0.213
	Benzene	16	mg/kg	0.0536	<0.0204	<0.0140	<0.0173	<0.0191	<0.0255	<0.0108	<0.0107
	Bromobenzene	160	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	Bromochloromethane	—	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	Bromodichloromethane	5.3	mg/kg	<0.00244	<0.00326	<0.00223	<0.00277	<0.00306	<0.00408	<0.00173	<0.00170
	Bromoform	340	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	Bromomethane	15	mg/kg	<0.0244	<0.0326	<0.0223	<0.0277	<0.0306	<0.0408	<0.0173	<0.0170
	Carbon disulfide	500	mg/kg	<0.122	<0.163	<0.112	<0.139	<0.153	<0.204	<0.0860	<0.0850
Carbon tetrachloride	13	mg/kg	<0.0153	<0.0204	<0.0140	<0.0173	<0.0191	<0.0255	<0.0108	<0.0107	
Chlorobenzene	180	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213	
Chloroethane	1400	mg/kg	<0.244	<0.326	0.499	0.480 J	0.298 J	<0.408	<0.172	0.313 J	
Chloroform	5.8	mg/kg	<0.00730	<0.00975	<0.00670	<0.00830	<0.00915	<0.0123	<0.00515	<0.00510	
Chloromethane	250	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213	
cis-1,2-Dichloroethene	270	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213	
cis-1,3-Dichloropropene	—	mg/kg	<0.0153	<0.0204	<0.0140	<0.0173	<0.0191	<0.0255	<0.0108	<0.0107	
Dibromochloromethane	140	mg/kg	<0.00610	<0.00815	<0.00560	<0.00695	<0.00765	<0.0102	<0.00431	<0.00426	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-EB-019							
				21AIN-EB-016	21AIN-EB-017	21AIN-EB-018	Primary	Duplicate	21AIN-EB-020	21AIN-EB-021	21AIN-EW-001
SW8260D (VOCs)	Dibromomethane	45	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	Dichlorodifluoromethane	220	mg/kg	0.0933 J	0.410	3.97	0.958 J*	0.537 J*	1.20	<0.0860	2.66 J
	Ethylbenzene	72	mg/kg	0.478	<0.0407	0.0463 J	<0.0347	<0.0382	0.192	<0.0216	0.513
	Hexachlorobutadiene	3.3	mg/kg	<0.0244	<0.0326	<0.0223	<0.0277	<0.0306	<0.0408	<0.0173	<0.0170
	Isopropylbenzene	54	mg/kg	0.206	<0.0407	0.0240 J	0.0312 J	<0.0382	0.0805 J	<0.0216	0.357
	m,p-xylenes	57	mg/kg	1.90	0.133 J	0.199	0.0832 J*	0.0489 J*	0.815	<0.0431	0.868
	Methyl isobutyl ketone	2200	mg/kg	<0.305	<0.407	<0.279	<0.346	<0.382	<0.510	<0.216	<0.213
	Methylene chloride	630	mg/kg	<0.122	<0.163	<0.112	<0.139	<0.153	<0.204	<0.0860	<0.0850
	Methyl-t-butyl ether (MTBE)	970	mg/kg	<0.122	<0.163	<0.112	<0.139	<0.153	<0.204	<0.0860	<0.0850
	Naphthalene	42	mg/kg	1.93	0.137	0.466	0.911	0.682	1.58	0.0504	21.5
	n-Butylbenzene	20	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	n-Propylbenzene	52	mg/kg	0.285	<0.0407	0.0502 J	<0.0347	<0.0382	0.175	<0.0216	0.521
	o-Xylene	57	mg/kg	1.46	0.0977	0.224	0.388 J*	0.207 J*	0.815	<0.0216	0.209
	p-Isopropyltoluene	—	mg/kg	0.294	<0.130	0.243	0.762 J*	1.59 J*	0.277 J	<0.0690	1.67
	sec-Butylbenzene	28	mg/kg	0.215	<0.0407	0.0921	0.393 J*	0.194 J*	0.148	<0.0216	0.402
	Styrene	180	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	tert-Butylbenzene	35	mg/kg	0.0500 J	<0.0407	0.0190 J	0.0949	0.0596 J	0.0469 J	<0.0216	0.151
	Tetrachloroethene	68	mg/kg	<0.0153	<0.0204	<0.0140	<0.0173	<0.0191	<0.0255	<0.0108	<0.0107
	Toluene	200	mg/kg	0.570	1.15	0.0714	0.0582 J	0.0626 J	1.49	0.0138 J	0.0460
	Total Xylenes	57	mg/kg	3.36	0.230 J	0.422	0.471 J*	0.256 J*	1.63	<0.0645	1.08
	trans-1,2-Dichloroethene	960	mg/kg	<0.0305	<0.0407	<0.0279	<0.0347	<0.0382	<0.0510	<0.0216	<0.0213
	trans-1,3-Dichloropropene	29	mg/kg	<0.0153	<0.0204	<0.0140	<0.0173	<0.0191	<0.0255	<0.0108	<0.0107
	Trichloroethene	7.1	mg/kg	<0.0122	<0.0163	<0.0112	<0.0138	<0.0153	<0.0204	<0.00860	<0.00850
	Trichlorofluoromethane	980	mg/kg	<0.0610	<0.0815	0.418	<0.0695	<0.0765	<0.102	<0.0431	<0.0425
	Trichlorotrifluoroethane	740	mg/kg	<0.122	<0.163	<0.112	<0.139	<0.153	<0.204	<0.0860	<0.0850
	Vinyl acetate	2100	mg/kg	<0.122	<0.163	<0.112	<0.139	<0.153	<0.204	<0.0860	<0.0850
Vinyl chloride	0.69	mg/kg	<0.000975	<0.00130	<0.000895	<0.00111	<0.00122	<0.00163	<0.000690	<0.000680	
SW8270D- SIM (PAHs)	1-Methylnaphthalene	68	mg/kg	4.68 JH*	0.196 JH*	1.28	3.79 JH*	3.54 JH*	2.69	3.18	37.3 JH*
	2-Methylnaphthalene	420	mg/kg	3.17 JH*	0.225 JH*	0.756	0.680 JH*	0.588 JH*	2.25	3.19	38.2 JH*
	Acenaphthene	6300	mg/kg	0.122 JH*	<0.173	0.0750 J	0.207 JH*	0.258 JH*	<0.0835	<0.150	0.242 JH*
	Acenaphthylene	3100	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Anthracene	31000	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Benzo(a)anthracene	20	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Benzo(a)pyrene	2	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Benzo(b)fluoranthene	20	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Benzo(g,h,i)perylene	3100	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Benzo(k)fluoranthene	200	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Chrysene	2000	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Dibenzo(a,h)anthracene	2	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Fluoranthene	4200	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Fluorene	4200	mg/kg	0.122 JH*	<0.173	<0.0630	0.123 JH*	0.157 JH*	<0.0835	0.0910 J	0.307 JH*
	Indeno(1,2,3-cd)pyrene	20	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	<0.0144
	Naphthalene	42	mg/kg	1.79 JH*	0.0934 JH*	0.234	0.737 JH*	0.853 JH*	0.732	0.909	13.4 JH*
	Phenanthrene	3100	mg/kg	<0.0735	<0.173	<0.0630	0.0488 JH*	0.0553 JH*	<0.0835	<0.150	0.0735 JH*
Pyrene	3100	mg/kg	<0.0735	<0.173	<0.0630	<0.0645	<0.0805	<0.0835	<0.150	0.00844 J	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-EW-004							
				21AIN-EW-002	21AIN-EW-003	Primary	Duplicate	21AIN-EW-005	21AIN-EW-006	21AIN-EW-007	21AIN-EW-008
AK101	Gasoline Range Organics	100	mg/Kg	10.3 JH*	<3.63 B*	605 JH*	500 JH*	<2.82 B*	10.4 JH*	7.72 JH*	<3.07 B*
AK102	Diesel Range Organics	200	mg/Kg	60.2	121	2,380	2,290	13.9 J	660	650	31.1
AK103	Residual Range Organics	2,000	mg/Kg	184	<56.0	<55.0	<54.5	<54.5	518	2,190	84.8 J
SW8260D (VOCs)	1,1,1,2-Tetrachloroethane	30	mg/kg	<0.0164	<0.0146	<0.0145	<0.0142	<0.0113	<0.0262	<0.0182	<0.0123
	1,1,1-Trichloroethane	360	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	1,1,2,2-Tetrachloroethane	8.8	mg/kg	<0.00165	<0.00145	<0.00145	<0.00142	<0.00112	<0.00262	<0.00183	<0.00123
	1,1,2-Trichloroethane	2.3	mg/kg	<0.000820	<0.000725	<0.000725	<0.000710	<0.000565	<0.00131	<0.000910	<0.000615
	1,1-Dichloroethane	67	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	1,1-Dichloroethene	480	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	1,1-Dichloropropene	—	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	1,2,3-Trichlorobenzene	110	mg/kg	<0.0820	<0.0725	<0.0725	<0.0710	<0.0565	<0.131	<0.0910	<0.0615
	1,2,3-Trichloropropane	0.089	mg/kg	<0.00165	<0.00145	<0.00145	<0.00142	<0.00112	<0.00262	<0.00183	<0.00123
	1,2,4-Trichlorobenzene	65	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	1,2,4-Trimethylbenzene	43	mg/kg	0.386	<0.0725	16.6	13.9	0.0600 J	0.111 J	0.213	<0.0615
	1,2-Dibromo-3-chloropropane	—	mg/kg	<0.0820	<0.0725	<0.0725	<0.0710	<0.0565	<0.131	<0.0910	<0.0615
	1,2-Dibromoethane	0.62	mg/kg	<0.00124	<0.00109	<0.00109	<0.00107	<0.000845	<0.00197	<0.00137	<0.000920
	1,2-Dichlorobenzene	78	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	1,2-Dichloroethane	8	mg/kg	<0.00165	<0.00145	<0.00145	<0.00142	<0.00112	<0.00262	<0.00183	<0.00123
	1,2-Dichloropropane	25	mg/kg	<0.00820	<0.00725	<0.00725	<0.00710	<0.00565	<0.0131	<0.00910	<0.00615
	1,3,5-Trimethylbenzene	37	mg/kg	0.284	0.0716	9.53	8.81	0.0425	0.0884	0.205	0.00981 J
	1,3-Dichlorobenzene	62	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	1,3-Dichloropropane	—	mg/kg	<0.00820	<0.00725	<0.00725	<0.00710	<0.00565	<0.0131	<0.00910	<0.00615
	1,4-Dichlorobenzene	31	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	2,2-Dichloropropane	—	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	2-Butanone (MEK)	23000	mg/kg	<0.205	<0.181	<0.181	<0.177	<0.141	<0.328	<0.228	<0.154
	2-Chlorotoluene	—	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	2-Hexanone	380	mg/kg	<0.0985	<0.0870	<0.0870	<0.0850	<0.0675	<0.157	<0.110	<0.0735
	4-Chlorotoluene	—	mg/kg	<0.0164	<0.0146	<0.0145	<0.0142	<0.0113	<0.0262	<0.0182	<0.0123
	Acetone	100000	mg/kg	<0.205	<0.181	<0.181	<0.177	<0.141	0.291 J	<0.228	<0.154
	Benzene	16	mg/kg	<0.0103	<0.00910	0.0163 J	0.0206	0.00507 J	<0.0164	<0.0114	<0.00765
	Bromobenzene	160	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	Bromochloromethane	—	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	Bromodichloromethane	5.3	mg/kg	<0.00165	<0.00145	<0.00145	<0.00142	<0.00112	<0.00262	<0.00183	<0.00123
	Bromoform	340	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	Bromomethane	15	mg/kg	<0.0164	<0.0146	<0.0145	<0.0142	<0.0113	<0.0262	<0.0182	<0.0123
	Carbon disulfide	500	mg/kg	<0.0820	<0.0725	<0.0725	<0.0710	<0.0565	<0.131	<0.0910	<0.0615
Carbon tetrachloride	13	mg/kg	<0.0103	<0.00910	<0.00910	<0.00885	<0.00705	<0.0164	<0.0114	<0.00765	
Chlorobenzene	180	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	0.0107 J	<0.0328	<0.0228	<0.0154	
Chloroethane	1400	mg/kg	<0.165	<0.145	<0.145	<0.142	2.32	0.994	<0.183	<0.123	
Chloroform	5.8	mg/kg	<0.00494	<0.00436	<0.00436	<0.00426	<0.00338	<0.00785	<0.00545	<0.00368	
Chloromethane	250	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154	
cis-1,2-Dichloroethene	270	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154	
cis-1,3-Dichloropropene	—	mg/kg	<0.0103	<0.00910	<0.00910	<0.00885	<0.00705	<0.0164	<0.0114	<0.00765	
Dibromochloromethane	140	mg/kg	<0.00411	<0.00363	<0.00363	<0.00355	<0.00282	<0.00655	<0.00456	<0.00307	

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

Analytical Method	Analyte	Regulatory Limit	Units	21AIN-EW-004							
				21AIN-EW-002	21AIN-EW-003	Primary	Duplicate	21AIN-EW-005	21AIN-EW-006	21AIN-EW-007	21AIN-EW-008
SW8260D (VOCs)	Dibromomethane	45	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	Dichlorodifluoromethane	220	mg/kg	0.0896 J	0.125 J	0.171	0.222	5.64	3.63	0.242	<0.0615
	Ethylbenzene	72	mg/kg	0.0251 J	<0.0181	0.925	0.829	<0.0141	0.0236 J	0.0228 J	<0.0154
	Hexachlorobutadiene	3.3	mg/kg	<0.0164	<0.0146	<0.0145	<0.0142	<0.0113	<0.0262	<0.0182	<0.0123
	Isopropylbenzene	54	mg/kg	0.0267 J	<0.0181	0.546	0.440	<0.0141	<0.0328	<0.0228	<0.0154
	m,p-xylenes	57	mg/kg	0.0555 J	<0.0363	2.19	2.07	0.0178 J	<0.0655	0.0711 J	<0.0307
	Methyl isobutyl ketone	2200	mg/kg	<0.205	<0.181	<0.181	<0.177	<0.141	<0.328	<0.228	<0.154
	Methylene chloride	630	mg/kg	<0.0820	<0.0725	<0.0725	<0.0710	<0.0565	<0.131	<0.0910	<0.0615
	Methyl-t-butyl ether (MTBE)	970	mg/kg	<0.0820	<0.0725	<0.0725	<0.0710	<0.0565	<0.131	<0.0910	<0.0615
	Naphthalene	42	mg/kg	1.05	0.0153 J	15.1	14.1	0.0335	0.167	0.204	0.0104 J
	n-Butylbenzene	20	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	n-Propylbenzene	52	mg/kg	0.152	0.0123 J	0.785	0.624	<0.0141	<0.0328	0.0214 J	<0.0154
	o-Xylene	57	mg/kg	<0.0205	<0.0181	0.159	0.177	<0.0141	0.0223 J	0.0670	<0.0154
	p-Isopropyltoluene	—	mg/kg	0.164	<0.0580	1.10	0.958	<0.0451	<0.105	<0.0730	<0.0491
	sec-Butylbenzene	28	mg/kg	0.141	<0.0181	0.750	0.641	<0.0141	<0.0328	0.0210 J	<0.0154
	Styrene	180	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	0.0458 J	<0.0228	<0.0154
	tert-Butylbenzene	35	mg/kg	<0.0205	<0.0181	0.0879	0.0829	<0.0141	<0.0328	<0.0228	<0.0154
	Tetrachloroethene	68	mg/kg	<0.0103	<0.00910	<0.00910	<0.00885	<0.00705	<0.0164	<0.0114	<0.00765
	Toluene	200	mg/kg	<0.0205	<0.0181	0.0940	0.140	<0.0141	1.41	0.310	<0.0154
	Total Xylenes	57	mg/kg	0.0555 J	<0.0545	2.35	2.25	<0.0423	<0.0980	0.138	<0.0460
	trans-1,2-Dichloroethene	960	mg/kg	<0.0205	<0.0181	<0.0181	<0.0177	<0.0141	<0.0328	<0.0228	<0.0154
	trans-1,3-Dichloropropene	29	mg/kg	<0.0103	<0.00910	<0.00910	<0.00885	<0.00705	<0.0164	<0.0114	<0.00765
	Trichloroethene	7.1	mg/kg	<0.00820	<0.00725	<0.00725	<0.00710	<0.00565	<0.0131	<0.00910	<0.00615
	Trichlorofluoromethane	980	mg/kg	0.523	<0.0363	<0.0363	<0.0355	<0.0282	<0.0655	0.444	2.30
	Trichlorotrifluoroethane	740	mg/kg	<0.0820	<0.0725	<0.0725	<0.0710	<0.0565	<0.131	<0.0910	<0.0615
	Vinyl acetate	2100	mg/kg	<0.0820	<0.0725	<0.0725	<0.0710	<0.0565	<0.131	<0.0910	<0.0615
Vinyl chloride	0.69	mg/kg	<0.000660	<0.000580	<0.000580	<0.000565	<0.000451	<0.00104	<0.000730	<0.000491	
SW8270D- SIM (PAHs)	1-Methylnaphthalene	68	mg/kg	0.752	1.26	16.7 JH*	17.5 JH*	0.0230 J	0.180	0.216	0.0144 J
	2-Methylnaphthalene	420	mg/kg	0.852	1.69	22.1 JH*	23.0 JH*	0.0303	0.148	0.140	0.0158 J
	Acenaphthene	6300	mg/kg	<0.0142	0.0188 J	0.135 JH*	0.141 JH*	<0.0137	<0.0154	<0.0141	<0.0136
	Acenaphthylene	3100	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Anthracene	31000	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Benzo(a)anthracene	20	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Benzo(a)pyrene	2	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Benzo(b)fluoranthene	20	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Benzo(g,h,i)perylene	3100	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Benzo(k)fluoranthene	200	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Chrysene	2000	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Dibenzo(a,h)anthracene	2	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Fluoranthene	4200	mg/kg	<0.0142	0.00731 J	0.0127 J	0.0115 J	0.0115 J	<0.0154	0.0109 J	0.0125 J
	Fluorene	4200	mg/kg	0.00745 J	0.0472	0.306 JH*	0.322 JH*	<0.0137	<0.0154	<0.0141	<0.0136
	Indeno(1,2,3-cd)pyrene	20	mg/kg	<0.0142	<0.0140	<0.0136	<0.0137	<0.0137	<0.0154	<0.0141	<0.0136
	Naphthalene	42	mg/kg	0.497	0.376	7.94 JH*	8.04 JH*	0.0174 J	0.0613	0.0733	0.00728 J
	Phenanthrene	3100	mg/kg	0.00735 J	0.0113 J	0.0497 JH*	0.0486 JH*	0.0167 J	0.0129 J	0.0162 J	0.0124 J
	Pyrene	3100	mg/kg	<0.0142	<0.0140	0.0106 J	0.00990 J	0.00997 J	<0.0154	0.0108 J	0.0123 J

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
EXPANSION AREA EXCAVATION EXTENT SAMPLES**

- Notes: Results reported from SGS North America, Inc. work orders 1215218 and 1215266.
Regulatory limits from 18 AAC 75.341 Table A2 Method One - Petroleum Hydrocarbon Soil Cleanup Levels in the Arctic Zone and Table B1 Method Two - Arctic Zone Cleanup Levels (Human Health).
DEC Alaska Department of Environmental Conservation
EPA United States Environmental Protection Agency
PAHs polynuclear aromatic hydrocarbons
VOCs volatile organic compounds
mg/kg milligrams per kilogram
— No applicable regulatory limit exists for the associated analyte.
< Analyte was not detected; reported as <LOD.
<Bold The laboratory's limit of detection (LOD) is greater than the regulatory limit.
Bold The detected concentration exceeds the regulatory limit for the associated analyte.
J Estimated concentration, detected greater than the detection limit (DL) and less than the limit of quantitation (LOQ). Flag applied by the laboratory.
B* Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc. (*)
J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)
JH* Estimated concentration, biased high due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
GAC TREATED WATER RESULTS**

Analytical Method	Analyte	Groundwater Cleanup Level	Discharge Limits	Units	21AIN-GE-001	
					Primary	Field Duplicate
AK101	Gasoline Range Organics	2.2	—	mg/L	<0.0500	<0.0500
AK102	Diesel Range Organics	1.5	—	mg/L	1.02 J*	1.40 J*
AK103	Residual Range Organics	1.1	—	mg/L	0.846	1.12
	Total Aqueous Hydrocarbons (TAqH)	—	15	µg/L	0.448	0.663
	Total Aromatic Hydrocarbons (TAH)	—	10	µg/L	0.917	0.598
	1,1,1,2-Tetrachloroethane	5.7	—	µg/L	<0.250	<0.250
	1,1,1-Trichloroethane	8,000	—	µg/L	<0.500	<0.500
	1,1,2,2-Tetrachloroethane	0.76	—	µg/L	<0.250	<0.250
	1,1,2-Trichloroethane	0.41	—	µg/L	<0.200	<0.200
	1,1-Dichloroethane	28	—	µg/L	<0.500	<0.500
	1,1-Dichloroethene	280	—	µg/L	<0.500	<0.500
	1,1-Dichloropropene	—	—	µg/L	<0.500	<0.500
	1,2,3-Trichlorobenzene	7	—	µg/L	<0.500	<0.500
	1,2,3-Trichloropropane	0.0075	—	µg/L	<0.500	<0.500
	1,2,4-Trichlorobenzene	4	—	µg/L	<0.500	<0.500
	1,2,4-Trimethylbenzene	56	—	µg/L	0.829 J	0.858 J
	1,2-Dibromo-3-chloropropane	—	—	µg/L	<5.00	<5.00
	1,2-Dibromoethane	0.075	—	µg/L	<0.0375	<0.0375
	1,2-Dichlorobenzene	300	—	µg/L	<0.500	<0.500
	1,2-Dichloroethane	1.7	—	µg/L	<0.250	<0.250
	1,2-Dichloropropane	8.2	—	µg/L	<0.500	<0.500
	1,3,5-Trimethylbenzene	60	—	µg/L	0.500 J	0.509 J
	1,3-Dichlorobenzene	300	—	µg/L	<0.500	<0.500
	1,3-Dichloropropane	—	—	µg/L	<0.250	<0.250
	1,4-Dichlorobenzene	4.8	—	µg/L	<0.250	<0.250
	2,2-Dichloropropane	—	—	µg/L	<0.500	<0.500
	2-Butanone (MEK)	5,600	—	µg/L	<5.00	<5.00
	2-Chlorotoluene	—	—	µg/L	<0.500	<0.500
	2-Hexanone	38	—	µg/L	<5.00	<5.00
	4-Chlorotoluene	—	—	µg/L	<0.500	<0.500
	Benzene	4.6	—	µg/L	<0.200	<0.200
	Bromobenzene	62	—	µg/L	<0.500	<0.500
	Bromochloromethane	—	—	µg/L	<0.500	<0.500
	Bromodichloromethane	1.3	—	µg/L	<0.250	<0.250
	Bromoform	33	—	µg/L	<0.500	<0.500
	Bromomethane	7.5	—	µg/L	<3.00	<3.00
	Carbon disulfide	810	—	µg/L	<5.00	<5.00
	Carbon tetrachloride	4.6	—	µg/L	<0.500	<0.500
SW8260D (VOCs)	Chlorobenzene	78	—	µg/L	<0.250	<0.250
	Chloroethane	21,000	—	µg/L	3.16	2.79
	Chloroform	2.2	—	µg/L	<0.500	<0.500
	Chloromethane	190	—	µg/L	<0.500	<0.500
	cis-1,2-Dichloroethene	36	—	µg/L	<0.500	<0.500
	cis-1,3-Dichloropropene	4.7	—	µg/L	<0.250	<0.250
	Dibromochloromethane	8.7	—	µg/L	<0.250	<0.250
	Dibromomethane	8.3	—	µg/L	<0.500	<0.500
	Dichlorodifluoromethane	200	—	µg/L	34.9	32.4
	Ethylbenzene	15	—	µg/L	<0.500	<0.500
	Hexachlorobutadiene	1.4	—	µg/L	<0.500	<0.500
	Isopropylbenzene	450	—	µg/L	<0.500	<0.500
	m,p-xylenes	190	—	µg/L	<1.00	<1.00
	Methyl isobutyl ketone	6,300	—	µg/L	<5.00	<5.00
	Methylene chloride	110	—	µg/L	<5.00	<5.00
	Methyl-t-butyl ether (MTBE)	140	—	µg/L	<5.00	<5.00
	Naphthalene	1.7	—	µg/L	1.21	1.39
	n-Butylbenzene	1,000	—	µg/L	<0.500	<0.500
	n-Propylbenzene	660	—	µg/L	<0.500	<0.500
	o-Xylene	190	—	µg/L	0.315 J	<0.500
	p-Isopropyltoluene	—	—	µg/L	<0.500	<0.500
	sec-Butylbenzene	2,000	—	µg/L	<0.500	<0.500
	Styrene	1,200	—	µg/L	<0.500	<0.500
	tert-Butylbenzene	690	—	µg/L	<0.500	<0.500
	Tetrachloroethene	41	—	µg/L	<0.500	<0.500
	Toluene	1,100	—	µg/L	0.602 J	0.598 J
	Total Xylenes	190	—	µg/L	<1.50	<1.50
	trans-1,2-Dichloroethene	360	—	µg/L	<0.500	<0.500
	trans-1,3-Dichloropropene	4.7	—	µg/L	<0.500	<0.500
	Trichloroethene	2.8	—	µg/L	<0.500	<0.500
	Trichlorofluoromethane	5,200	—	µg/L	<0.500	<0.500
	Trichlorotrifluoroethane	10,000	—	µg/L	<5.00	<5.00
	Vinyl acetate	410	—	µg/L	<5.00	<5.00
	Vinyl chloride	0.19	—	µg/L	<0.0750	<0.0750

**WAINWRIGHT WATER TREATMENT PLANT UPGRADE
GAC TREATED WATER RESULTS**

Analytical Method	Analyte	Groundwater Cleanup Level	Discharge Limits	Units	21AIN-GE-001	
					Primary	Field Duplicate
8270D-SIM (PAHs)	1-Methylnaphthalene	11	—	µg/L	0.314 JL*	0.438 JL*
	2-Methylnaphthalene	36	—	µg/L	0.134 JL*	0.184 JL*
	Acenaphthene	530	—	µg/L	<0.0240 J*	<0.0240 J*
	Acenaphthylene	260	—	µg/L	<0.0240 J*	<0.0240 J*
	Anthracene	43	—	µg/L	<0.0240 J*	<0.0240 J*
	Benzo(a)anthracene	0.3	—	µg/L	<0.0240 J*	<0.0240 J*
	Benzo(a)pyrene	0.25	—	µg/L	<0.00960 J*	<0.00960 J*
	Benzo(b)fluoranthene	2.5	—	µg/L	<0.0240 J*	<0.0240 J*
	Benzo(g,h,i)perylene	0.26	—	µg/L	<0.0240 J*	<0.0240 J*
	Benzo(k)fluoranthene	0.8	—	µg/L	<0.0240 J*	<0.0240 J*
	Chrysene	2	—	µg/L	<0.0240 J*	<0.0240 J*
	Dibenzo(a,h)anthracene	0.25	—	µg/L	<0.00960 J*	<0.00960 J*
	Fluoranthene	260	—	µg/L	<0.0240 J*	0.0209 JL*
	Fluorene	290	—	µg/L	<0.0240 J*	<0.0240 J*
	Indeno(1,2,3-cd)pyrene	0.19	—	µg/L	<0.0240 J*	<0.0240 J*
	Naphthalene	1.7	—	µg/L	<0.0481 J*	<0.0481 J*
	Phenanthrene	170	—	µg/L	<0.0481 B*	<0.0481 B*
	Pyrene	120	—	µg/L	<0.0240 J*	0.0204 JL*

Notes: Results reported from SGS North America, Inc. work order 1215216.
Regulatory limits from 18 AAC 75.345 Table C Groundwater Cleanup Levels and the DEC Excavation General Dewatering Permit.

DEC Alaska Department of Environmental Conservation

PAHs polynuclear aromatic hydrocarbons

TAH Total aromatic hydrocarbons derived from the sum of detected PAHs.

TAqH Total aqueous hydrocarbons derived the sum of the detected concentrations of benzene, toluene, ethylbenzne, and xylenes.

VOCs volatile organic compounds

µg/L micrograms per liter

mg/L milligrams per liter

— No applicable regulatory limit exists for the associated analyte.

< Analyte was not detected; reported as <LOD.

<Bold The laboratory's limit of detection (LOD) is greater than the DEC Groundwater Cleanup Level.

Bold The detected concentration exceeds the DEC Groundwater Cleanup Level for the associated analyte.

J Estimated concentration, detected greater than the detection limit (DL) and less than the limit of quantitation (LOQ). Flag applied by the laboratory.

B* Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc. (*)

J* Estimated concentration due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)

JL* Estimated concentration, biased low due to quality control failures. Flag applied by Shannon & Wilson, Inc. (*)

Appendix A

Field Activity Reports (FARs) and Field Notes

CONTENTS

- August 2, 2021 FAR
- August 3, 2021 FAR
- August 4, 2021 FAR
- August 5, 2021 FAR
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- August 9, 2021 FAR
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- Scanned Field Book
- Soil Segregation Field-Screening Logs
- Analytical Sample Collection Logs

APPENDIX A: FIELD ACTIVITY REPORTS AND FIELD NOTES

DAILY FIELD ACTIVITY REPORTS

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact		Weather and Temperature
Client: North Slope Borough	General:	Olgoonik Corporation	55 F light rain, wind speed 10 mph
c: _____	Subcontractors:	_____	Times of Site Visits
c: _____			from: 14:00 to: 17:15
c: _____			from: _____ to: _____
Meetings Attended: _____			from: _____ to: _____
			from: _____ to: _____

No.	Construction Observations
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1. Topic and Location

Excavation and Field Screening the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) arrived on the afternoon flight from Utqiagvik. APW met Sean, the foreman for the Olgoonik Corporation (OC), at the air strip. After checking into the hotel and picking up equipment, APW met the OC crew onsite. The OC crew was digging a channel and constructing a berm to divert water from a planned overflow of the nearby bulk water storage tank away from the site.

APW marked out the location of the hotspot (EA19) near the eastern face of the water treatment plant (WTP), identified during the May 2021 limited site characterization. A pallet of supersacks was brought to the site along with a loader and shipping platform. The surficial material within the marked out area was excavated directly into supersacks. APW field-screened the working face of the excavation at regular intervals. Photoionization detector (PID) readings ranged from 0.2 to 397 parts per million (ppm). The elevated PID readings occurred within the first vertical foot of soil within the roadway used during winter water deliveries. A liner was encountered at roughly 18 inches to 2 feet below ground surface (bgs). As of 8/02, no soil tested from below the level of the liner exhibited elevated PID readings.

In total, 18 supersacks were filled and transported to the staging area at the old airport. The site was secured with caution tape pending resumption of excavation.

Further Action Recommended to Owner

Excavation to continue on 8/03.

Attachments

None.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photographs



Photograph 1: Delineating hotspot EA19 with survey markers.



Photograph 2: Excavating potentially contaminated soil into supersacks.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact	Weather and Temperature	Times of Site Visits
Client: North Slope Borough	General: Olgoonik Corporation	65 F wind speed <5 mph	
c:	Subcontractors:		
c:		from: 07:30 to: 12:00	
c:		from: 12:30 to: 17:15	
Meetings Attended:		from: to:	
		from: to:	

No.	Construction Observations
-----	---------------------------

1. Topic and Location

Excavation and Field Screening the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) arrived onsite and was shortly joined by the Olgoonik Corporation (OC) crew. Excavation and containment of the known contaminated soil at location EA19 resumed. An additional 16 supersacks were filled before photoionization detector (PID) readings returned to background levels.

After reaching soil reading <10 parts per million (ppm), excavation of the broader building footprint commenced. The excavation boundaries were painted on the ground. The soil along the eastern face of the water treatment plant (WTP) was excavated down to the liner, roughly 2 ft below ground surface (bgs). The 2-ft deep excavation extended approximately 35 ft to the southeast off the eastern face of the WTP by days end. APW field-screened the excavated soil at a rate of one headspace sample per 10 cubic yards of material removed. Excavated sandy gravel fill with <10 ppm readings on the PID was piled onsite for future use as backfill.

At 16:40 a new area of contamination was discovered. Stained soil was observed intermixed with sorbent materials and foam board. PID readings from this soil registered as high as 2,000 ppm. This contaminated material was located 22 ft northeast of the southeast corner of the WTP and 30 ft southeast and perpendicular off the building face. The assumed boundaries of this contaminated soil were spray painted on the ground, with excavation and containment planned for the following morning.

In total, 16 supersacks were filled and transported to the staging area at the old airport. Between 150 and 200 cubic yards of <10 ppm gravel fill was piled onsite to the south and southeast of the planned excavation extent. Ramps were constructed from clean fill to provide egress from the two doorways on the eastern face of the WTP and the site was secured with caution tape pending resumption of excavation.

Further Action Recommended to Owner

Excavation to continue on 8/04, including containment of newly discovered contaminated soil.

Attachments

None.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photographs



Photograph 1: Excavating down to 2 feet bgs off the eastern face of the WTP.



Photograph 2: New area of contamination discovered 37 feet east by northeast of the southeast corner of the WTP.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact		Weather and Temperature
Client: North Slope Borough	General:	Olgoonik Corporation	60 F wind speed <5 mph
c:	Subcontractors:	.....	Times of Site Visits
c:			from: 07:30 to: 12:00
c:			from: 12:30 to: 17:30
Meetings Attended:			from: to:
			from: to:

No.	Construction Observations
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1. Topic and Location

Excavation and Field Screening the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) arrived onsite and met the Olgoonik Corporation (OC) crew. Excavation and containment of the contaminated material discovered near the southeast corner of the water treatment plant (WTP) commenced. Limited field screening was performed on this material because staining was clearly visible and a strong petroleum odor was present.

While containment of visibly contaminated soil was underway, a second OC operator resumed extending the excavation footprint to the south and southeast. APW field-screened the excavated soil at a rate of one headspace sample per 10 cubic yards. Excavated gravel fill exhibiting photoionization detector (PID) <10 ppm was piled onsite to the southeast of the excavation. As the excavation progressed southward and neared location EA5 from the May 2021 limited site characterization, PID readings began to exceed 10 ppm. Further screening from location EA5 in the direction of the known contamination saw PID readings exceeding 100 ppm. As the contaminated soil excavation expanded, it appeared both these locations may be part of the same impacted area. Excavation of the gravel top fill ceased so that all personnel could assist with containment of the contaminated soil.

Near the end of the day, the OC operator unearthed what appeared to be a severed fuel line near the base of the excavation in the western sidewall toward the WTP. The pipe was threaded on one end and had a strong petroleum odor. Water was also observed beginning to pool within the excavation. APW and OC personnel discussed the logistics of permitting, containment, and treatment should dewatering become necessary.

In total, 60 supersacks were filled and transported to the staging area at the old airport. Roughly 150 cubic yards of <10 ppm gravel fill was piled onsite to the southeast of the planned excavation extent.

Further Action Recommended to Owner

Excavation to continue on 8/05, including containment of remaining contaminated soil.

Attachments

None.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photographs



Photograph 1: Containerizing soil excavated from within the hotspot identified on 8/03/21.



Photograph 2: Water beginning to pool within the contaminated soil excavation.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 3: A possible fuel pipe protruding from the western sidewall of the contaminated soil excavation.



Photograph 4: Supersacks staked at the staging area located at the old airport.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact	Weather and Temperature
Client: North Slope Borough c: c: c: Meetings Attended:	General: Olgoonik Corporation Subcontractors:	50 F wind gusts up to 15 mph Times of Site Visits from: 07:30 to: 12:00 from: 12:30 to: 17:30 from: to: from: to:

No.	Construction Observations
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1. Topic and Location

Excavation and Field Screening the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) arrived onsite and met the Olgoonik Corporation (OC) crew. Excavation and containment of the contaminated material resumed. APW field screened the working faces of the excavation at regular intervals to assess whether there was any change to contaminant concentrations as digging progressed. A strong petroleum odor remained present throughout the day.

We note that the most heavily impacted material appears to be the native silt underlying the liner and gravel fill. This material is present at a depth of roughly 2 feet below ground surface (bgs). This is also the same depth as the abandoned pipe (photo 1).

The excavation of the contaminated material between depths of 2 ft to 5 ft bgs grew to encompass much of the southern half of the planned footprint. PID readings from headspace samples indicated that the horizontal extent of the contamination may have been reached on the southern and western sides. The eastern edge approached the planned extent for the southern half of the footprint and did not progress further. PID readings from the northern sidewall still exceeded 300 parts per million (ppm) as of 8/5.

Around noon, APW was informed that an employee of the Olgoonik Hotel had tested positive for COVID-19. Project personnel believed it would be prudent for APW to relocate to the Olgoonik Camp to avoid exposure. Upon seeking approval, it was determined that a rapid test would be required. The paperwork was filed and testing may be performed as soon as 8/6.

101 supersacks were filled and transported to the staging area at the old airport on 8/5. The total number of supersacks staged as of this date is 199. All supersacks are marked with the numerical designation AIN WTP ###. Supersacks with a spray-painted X on the side contain soil that exhibited PID readings >100 ppm.

Further Action Recommended to Owner

Excavation to continue on 8/06, including containment of remaining contaminated soil.

Attachments

None.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photographs



Photograph 1: Excavating and containerizing soil from below 2' bgs exhibiting elevated PID readings.



Photograph 2: Contaminated soil excavation as of 8/5, facing southeast.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
-----------------------	-----------------------------------

Report Distribution	Contractor Name and Contact	Weather and Temperature
Client: North Slope Borough	General: Olgoonik Corporation	45 F wind gusts up to 10 mph
c: _____	Subcontractors: _____	Times of Site Visits
c: _____	_____	from: 07:30 to: 12:00
c: _____	_____	from: 12:30 to: 14:15
Meetings Attended: _____	_____	from: 14:45 to: 15:30
		from: _____ to: _____

No.	Construction Observations
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1. Topic and Location

Excavation and Field Screening the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) arrived onsite and met the Olgoonik Corporation (OC) crew. Excavation and containment of the contaminated material resumed. APW field screened the working faces of the excavation at regular intervals to assess whether there was any change to contaminant concentrations as digging progressed. Photoionization detector (PID) readings from headspace samples collected along the northern face of the contaminated soil excavation began to drop to double digits. By mid-morning, a clean edge was beginning to be defined.

New information came to light that additional positive diagnoses of COVID-19 were being reported in town. OC management decided to have all project personnel tested. At 1400, APW all OC employees went to the local clinic for a COVID test. Work resumed following testing, until a decision was reached to pause the job and have all personnel self-isolate until the test results were made available. The samples will be flown to Utiqigvik for analysis. Results are expected within 48 hours. APW returned to the Olgoonik Hotel to wait for results.

Additional water was observed pooling in the excavation when work was halted. We note that with precipitation forecasted for next week, dewatering may be required.

44 supersacks were filled and transported to the staging area at the old airport on 8/6. The total number of supersacks staged as of this date is 243. All supersacks are marked with the numerical designation AIN WTP ###. Supersacks with a spray-painted X on the side contain soil that exhibited PID readings >100 ppm.

Further Action Recommended to Owner

Excavation on-hold pending COVID-19 test results. Recommend preparing contingency plan for containing and treating the water accumulating in the excavation and contacting contaminated soil.

Attachments

None.

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REVIEW BY (PM initial/date)

8/9/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photographs



Photograph 1: Excavating and containerizing contaminated soil from below 2' bgs, facing east.



Photograph 2: Old airport staging area as of 8/06/2021.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/9/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact	Weather and Temperature
Client: North Slope Borough	General: Olgoonik Corporation	45 F wind <5 mph
c:	Subcontractors:	Times of Site Visits
c: .....	.....	from: 12:30 to: 17:30
c: .....	.....	from: to:
Meetings Attended: .....	.....	from: to:
.....	.....	from: to:

No.	Construction Observations
-----	---------------------------

1. Topic and Location

Excavation and Field Screening the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) was contacted by Shawn Howell with confirmation that enough Olgoonik Corporation (OC) crew members had tested negative for COVID-19 to resume work. Available personnel would be onsite at 1230 pm to resume excavation.

APW arrived onsite and observed several hundred gallons of water had accumulated in the excavation. OC personnel dug a temporary containment pond immediately south of the water treatment plant's southeast corner. The pond was lined with visqueen and a trash pump was used to dewater the excavation.

Excavation and containment of the contaminated material resumed once enough of the standing water was pumped into the holding pond. Delineation of the clean northern edge continued west to east. APW field screened the working face as the excavation progressed.

36 supersacks were filled and transported to the staging area at the old airport on 8/9. The total number of supersacks staged as of this date is 279. All supersacks are marked with the numerical designation AIN WTP ###. Supersacks with a spray-painted X on the side contain soil that exhibited photoionization detector (PID) readings >100 ppm.

Further Action Recommended to Owner

Several hundred gallons of potentially contaminated water was pumped into an onsite holding pond. Little capacity remains in this pond and precipitation is forecasted by the end of the week. Additional holding capacity or some kind of cover would be beneficial in the short term.

We will eventually have to treat/contain the water and submit confirmation samples to an analytical laboratory. Following receipt of the laboratory results, we will need to seek DEC approval to discharge the water.

Attachments

None.

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REVIEW BY (PM initial/date)

8/10/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
-----------------------	-----------------------------------

Photographs



Photograph 1: Water accumulated in the excavation while project personnel were in lockdown.



Photograph 2: Temporary containment pond constructed near the southeast corner of the WTP.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/10/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
-----------------------	-----------------------------------



Photograph 3: Pumping the potentially contaminated water into the onsite containment pond.



Photograph 4: Excavation and containment of contaminated soil resumed following dewatering.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

 8/10/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact	Weather and Temperature
Client: North Slope Borough	General: Olgoonik Corporation	38 F wind <5 mph
c: _____	Subcontractors: _____	Times of Site Visits
c: _____	_____	from: 07:00 to: 12:00
c: _____	_____	from: 12:30 to: 17:30
Meetings Attended: Morning Safety Briefing	_____	from: _____ to: _____
		from: _____ to: _____

No.	Construction Observations
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1. Topic and Location

Field Screening and Sampling the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) and the Olgoonik Corporation (OC) crew arrived onsite and held a morning safety meeting. Following the meeting, an OC operator scraped and piled the loose contaminated soil in the base of the excavation that was left in-place to insulate the permafrost. Once this loose material was piled up in the northeast corner of the excavation, APW proceeded to grid out and field-screen the base of the contaminated soil excavation that was advanced to finished grade. OC personnel resumed containment efforts on the now consolidated contaminated soil. The contaminated soil excavation as of 8/10/21 represents a little over 2,000 square feet within the greater water treatment plant (WTP) expansion footprint. While not a uniform rectangle, the excavation measures roughly 43-ft by 47-ft. 30 headspace samples were collected from the excavation base during the screening process. Photoionization detector (PID) readings were highest in the western half of the excavation near the existing WTP building and the unidentified pipe.

Around noon, concerns were raised about the rate of thaw of the permafrost and potential for forecasted precipitation. OC project management decided that backfilling any finished portions of the larger footprint should be done as soon as possible. APW was instructed to proceed with confirmation sample collection as to not impede backfilling efforts. Per Table 2B of the DEC Field Sampling Guidance, a 2,000 square foot excavation requires 9 analytical samples from the base. APW proceeded to collect the samples from the areas exhibiting the highest PID results.

- | | |
|---|--|
| 21AIN-EB-001 was collected at 13:20 | 21AIN-EB-006 was collected at 13:50 |
| 21AIN-EB-002 was collected at 13:25 | 21AIN-EB-007 was collected at 13:55 |
| 21AIN-EB-003/103 were collected at 13:30 | 21AIN-EB-008 was collected at 14:00 |
| 21AIN-EB-004 was collected at 13:40 | 21AIN-EB-009 was collected at 14:05 |
| 21AIN-EB-005 was collected at 13:45 | |

The sample locations were recorded with an EOS Arrow GPS unit and uploaded to ArcCollector. APW then proceeded to field-screen the southern half of the eastern sidewall. This portion of the sidewall represents the only part of the contaminated soil excavation that reached the horizontal limits of the expansion area footprint. 12 headspace samples were collected, distributed in two rows representing the upper and lower soil horizons. PID results within the upper 2 vertical feet were mostly below 10 parts per million (ppm). PID results from the lower horizon indicate that contamination is still present at the southeastern boundary of the expansion area footprint. APW collected one sidewall sample from the location exhibiting the highest PID reading. **21AIN-EW-001** was collected at 16:15.

93 supersacks were filled and transported to the staging area at the old airport on 8/10. The total number of supersacks staged as of this date is **372**. All supersacks are marked with the numerical designation AIN WTP ###. Supersacks with a spray-painted X on the side contain soil that exhibited photoionization detector (PID) readings >100 ppm.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/11/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location **AIN Water Treatment Plant Upgrade**

No. Construction Observations

Further Action Recommended to Owner

Excavation and containment activities to resume on 8/11.

Attachments

None.

Photographs



Photograph 1: First row of headspace samples within the contaminated soil excavation.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)
 8/11/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 2: Base of excavation analytical sample locations marked with pink pin flags.



Photograph 3: Field-screening locations on the southern half of the eastern sidewall marked with orange pin flags.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)
8/11/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact	Weather and Temperature
Client: North Slope Borough c: c: c: Meetings Attended: Project Coordination Meeting	General: Olgoonik Corporation Subcontractors:	33 F light snow, wind 5 mph Times of Site Visits from: 07:00 to: 12:00 from: 12:30 to: 17:30 from: to: from: to:

No.	Construction Observations
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1. Topic and Location

Field Screening the Water Treatment Plant Expansion Footprint and Collection of Waste Characterization Samples

Description of Field Activity and Observations

Adam Wyborny (APW) and the Olgoonik Corporation (OC) crew arrived onsite and held a morning safety meeting. Following the meeting, a laser tripod and elevation rod were used to check the depth of the excavation. Excavation and containment of the loose contaminated soil piled on 8/10 resumed.

APW and Ethan Reed temporarily departed the site to attend a project coordination meeting. Shawn Howell was in attendance and John Ford and Chris Darrah called in. Topics of discussion included the target excavation depth for the thermosiphons, what kind of liner to deploy in the excavation to separate the contaminated base from the clean fill, and how to handle and treat the water that was pumped from the excavation. John Ford also requested that the waste characterization samples collected from the supersacks be submitted to the laboratory on an expedited turnaround for the purpose of making the barge.

Following the meeting, APW went to the staging area and began opening supersacks for the purpose of screening the contents and selecting sample locations. A random 40 of the roughly 400 supersacks present at the time were screened. Photoionization detector (PID) readings ranged between 14 and 730 parts per million (ppm). APW collected five analytical samples and one field duplicate sample for waste characterization from the five supersacks exhibiting the highest PID readings.

- 21AIN-WC-001 / 101** were collected at 13:10 from supersack #177
- 21AIN-WC-002** was collected at 13:15 from supersack #119
- 21AIN-WC-003** was collected at 13:20 from supersack #138
- 21AIN-WC-004** was collected at 13:25 from supersack #359
- 21AIN-WC-005** was collected at 13:30 from supersack #398

APW returned to the site and observed that the western sidewall bordering the water treatment plant (WTP) had been excavated to the planned limits. The material was piled in the northwest corner and comingled with material excavated from that corner. PID readings indicated the presence of contamination. APW directed this material to containment. Once the comingled material was removed, APW worked with an OC operator to excavate the northern side of the excavation to the planned limits. Both potentially clean and contaminated material was encountered while the excavation progressed eastward. Three truckloads of potentially clean material was sent to the stockpile site while contaminated material was directed to containment.

Prior to days end, all OC personnel assisted with deploying a visqueen liner and gravel fill over the portion of the excavation that was sampled on 8/10. A 35-gallon granular activated carbon (GAC) polydrum, pumps, and a 1,000 gallon collapsible tank were staged by the holding pond.

48 supersacks were filled and transported to the staging area at the old airport on 8/11. The total number of supersacks staged as of this date is **428**. All supersacks are marked with the numerical designation AIN WTP ###. Supersacks with a spray-painted X on the side contain soil that exhibited PID readings >100 ppm.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/12/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location **AIN Water Treatment Plant Upgrade**

No. Construction Observations

Further Action Recommended to Owner

Excavation and containment activities to resume on 8/12.

Attachments

None.

Photographs



Photograph 1: Excavating the northern edge of the footprint and trucking out potentially clean soil.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/12/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 2: Deploying visqueen and gravel over a finished portion of the excavation.



Photograph 3: The supersack staging area at the old airport as of 8/11/21.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)
8/12/21

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact	Weather and Temperature
Client: North Slope Borough	General: Olgoonik Corporation	36 F wind <5 mph
c: _____	Subcontractors: _____	Times of Site Visits
c: _____	_____	from: 07:00 to: 12:00
c: _____	_____	from: 12:30 to: 17:30
Meetings Attended: Morning Safety Meeting	_____	from: _____ to: _____
		from: _____ to: _____

No.	Construction Observations
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1. Topic and Location

Field Screening and Sampling the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) and the Olgoonik Corporation (OC) crew arrived onsite and held a morning safety meeting. Following the meeting, APW field-screened the southern working face of the excavation to verify the clean edge was reached. The results of all headspace samples were below 10 parts per million (ppm) on the photoionization detector (PID), save for one isolated hotspot. APW marked this location so that excavation could proceed.

APW then began field-screening the finished base of excavation at the western and northern extents of the expansion footprint. This 1,500 square foot (sf) L-shaped area was advanced to finished grade on 8/11. APW collected 25 headspace samples evenly distributed throughout the area. Following the screening effort, six base of excavation analytical samples were collected from the locations exhibiting the highest PID readings. One sample was collected from a low reading area to show the clean extent. The EOS Arrow was used to collect GPS locations for the base of excavation samples.

- | | |
|---|--|
| 21AIN-EB-010 were collected at 10:00 | 21AIN-EB-013 was collected at 10:15 |
| 21AIN-EB-011 was collected at 10:05 | 21AIN-EB-014 was collected at 10:20 |
| 21AIN-EB-012 was collected at 10:10 | 21AIN-EB-015 was collected at 10:25 |

Visqueen liner was placed over the excavation base immediately following sampling. Loads of clean gravel fill were deposited in the interior of the excavation and later compacted. APW divided time between monitoring the excavation of the southern extent of the footprint and field screening the northern and western sidewalls. 26 headspace samples were collected from the accessible 50 linear feet of northern sidewall and 44 headspace samples were collected from the 85 linear feet of western sidewall. Following the screening effort, two analytical samples were collected from each of the northern and western sidewalls at the locations exhibiting the highest PID readings. One of the samples collected from the southern end of the western sidewall was chosen to show the clean extent. Again, the EOS Arrow was used to record sample locations.

- | | |
|--|---|
| 21AIN-EW-002 was collected at 1610 from the northern sidewall | 21AIN-EW-004 / 104 were collected at 1625 from the west sidewall |
| 21AIN-EW-003 was collected at 1615 from the northern sidewall | 21AIN-EW-005 was collected at 1710 from the western sidewall |

The 35-gallon granular activated carbon (GAC) polydrum was used to treat the water in the temporary holding pond. The treated water was contained in a 1,000 gallon collapsible tank. Water treatment will continue on 8/13.

Four truckloads of potentially clean material excavated from below two vertical feet at the southern extent of the footprint were brought to the offsite stockpile. An estimated total of 100 cubic yards of material is presently stockpiled as of this date.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/13/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location **AIN Water Treatment Plant Upgrade**

No. Construction Observations

Further Action Recommended to Owner

Excavation and containment activities to resume on 8/13.

Recommend collection of treated water samples to submit on an expedited turnaround.

Attachments

None.

Photographs



Photograph 1: Field-screening and sampling the L-shaped excavation base at the northern and western ends of the footprint.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/13/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 2: Deploying visqueen and gravel over a finished portion of the excavation.



Photograph 3: Field-screening and sampling the accessible portion of the northern extent sidewall.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/13/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 4: Field-screening and sampling the western extent sidewall.



Photograph 5: Treating the water contained in the temporary holding pond with GAC.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/13/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 6: Roughly 3,500 square feet of the footprint backfilled with clean gravel and compacted.



Photograph 7: The potentially clean soil stockpile at the old airport as of 8/12/21.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)
8/13/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact	Weather and Temperature
Client: North Slope Borough	General: Olgoonik Corporation	38 F wind <5 mph
c: _____	Subcontractors: _____	Times of Site Visits
c: _____	_____	from: 07:00 to: 12:00
c: _____	_____	from: 12:30 to: 17:45
Meetings Attended: Morning Safety Meeting	_____	from: _____ to: _____
		from: _____ to: _____

No.	Construction Observations
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1. Topic and Location

Field Screening and Sampling the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) and the Olgoonik Corporation (OC) crew arrived onsite following a morning safety meeting. Water treatment resumed and final leveling of the southern extent of the excavation was performed. While the southern portion of the excavation was scraped down to the target depth, APW studied the onsite contaminated soil pile and determined that enough material was present as to require an additional waste characterization sample to meet the minimum sample collection frequency. APW location a portion of the pile with heavy staining and a strong petroleum odor and collected a sample.

- **21AIN-WC-006** was collected at 0930.

Treatment of the water contained in the temporary holding pond was completed. APW retrieved unused sampling supplies from the May 2021 limited site characterization effort and prepared labels. One confirmation sample and one field duplicate sample were collected from the effluent of the 35-gallon granular activated carbon (GAC) polydrum.

- **21AIN-GE-001 / 101** were collected at 1100.

APW returned to the camp and prepared all samples collected up to this date for shipment. Two coolers were prepared. One cooler contained excavation extent samples with a standard turnaround requested, while the second cooler contained waste characterization and GAC effluent samples with a 5-day rush requested. Both coolers departed on the afternoon flight to Utqiaqvik. Anticipated arrival in Fairbanks is Saturday the 14th or Monday the 16th.

Upon returning to the site, the southern extent of the excavation was completed to target depth. The OC crew resumed containment operations for the contaminated soil piled at the eastern extent of the footprint. APW field-screened the southern sidewall and excavation base. The southern portion of the excavation represented a 1,250 square foot area with the southern sidewall measuring 50 linear feet. 20 headspace samples were collected from the excavation base and 24 headspace samples were collected from the southern sidewall. Five base of excavation analytical samples and one field duplicate sample were collected from the locations exhibiting the highest photoionization detector (PID) readings. Only one area in the lower middle portion of the southern sidewall exhibited elevated PID readings. A sidewall analytical sample was taken from this location. The EOS Arrow was used to collect GPS locations for the samples.

21AIN-EB-016 were collected at 15:25

21AIN-EB-019 / 119 were collected at 15:40

21AIN-EB-017 was collected at 15:30

21AIN-EB-020 was collected at 15:45

21AIN-EB-018 was collected at 15:35

21AIN-EW-006 was collected at 15:50

As soon as APW completed sampling activities, OC personnel deployed visqueen over the southern portion of the excavation and backfilling operations began. Clean gravel fill was hauled in from offsite and compacted.

24 supersacks were filled and transported to the staging area at the old airport on 8/13. The total number of supersacks staged as of this date is 452. All supersacks are marked with the numerical designation AIN WTP ###. Supersacks with a spray-painted X on the side contain soil that exhibited PID readings >100 ppm.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location **AIN Water Treatment Plant Upgrade**

No. Construction Observations

Further Action Recommended to Owner

Excavation and containment activities to resume on 8/14.

Attachments

None.

Photographs



Photograph 1: Field-screening and sampling the southern sidewall of the expansion area footprint.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

 8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 2: Field-screening and sampling the base of the southern portion of the expansion area footprint.



Photograph 3: Deploying visqueen over the southern end of the expansion area footprint.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 4: Backfilling the southern end of the expansion area footprint.



Photograph 5: Contaminated soil piled at the eastern extent of the expansion area footprint awaiting containment.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)
8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact		Weather and Temperature
Client: North Slope Borough	General:	Olgoonik Corporation	40 F Rain wind gusts >15 mph
c:	Subcontractors:	.....	Times of Site Visits
c:			from: 07:00 to: 12:00
c:			from: 12:30 to: 17:30
Meetings Attended: Morning Safety Meeting			from: to:
			from: to:

No. Construction Observations

1. Topic and Location

Field Screening and Sampling the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) and the Olgoonik Corporation (OC) crew arrived onsite following a morning safety meeting. Containment of the contaminated soil piled at the eastern end of the expansion area footprint resumed. APW field screened the portion of the eastern sidewall not obstructed by the contaminated soil pile. The excavation base between the contaminated soil pile and the boundary of the backfilled area (see Photo 1) was completely submerged. Ethan Reed used the excavator to get a scoop of the bottom material. APW collected the final excavation base sample from this scoop.

- **21AIN-EB-021** was collected from the excavation base in the northeast quadrant at 0825.

Upon analyzing the headspace samples collected from the eastern sidewall, it appeared that the clean extent had been reached at the northeast quadrant. Only one headspace sample exhibited significantly elevated photoionization detector (PID) readings, and it was the headspace sample in closest proximity to the contaminated soil pile. A sidewall sample was collected at this location.

- **21AIN-EW-007** was collected from the eastern sidewall within the northeast quadrant at 0900.

Following backfilling on 8/13, only a small portion of the southern sidewall within the northeast quadrant remained exposed. APW collected the final sidewall sample from this location.

- **21AIN-EW-008** was collected from the southern sidewall within the northeast quadrant at 0920

APW recorded the sample locations with the EOS Arrow before departing for the potentially clean soil stockpile at the old airport. Based on the total number of truckloads delivered to this stockpile, APW estimated the total volume at 100 cubic yards. Per Table 2A of the DEC Field Sampling Guidance, 10 headspace samples were collected. Two of these headspace samples exhibited PID readings above 10 parts per million (ppm). One of the headspace samples exceeded 100 ppm. Three analytical samples and one field duplicate sample were collected from the stockpiled soil at the locations exhibiting the highest PID readings.

21AIN-STKPL-001 was collected at 10:55

21AIN-STKPL-003 was collected at 11:10

21AIN-STKPL-002 / 102 were collected at 11:00

With the excavation extent reached in all areas and all the samples required by the CSMP collected, APW returned to the camp and booked flights and freight back to Fairbanks for Monday the 16th. Remaining contaminated soil will be contained by the morning of the 16th and backfilling/compacting will commence. APW then returned to the excavation site to observe contaminated soil containment operations.

108 supersacks were filled and transported to the staging area at the old airport on 8/14. The total number of supersacks staged as of this date is 560. All supersacks are marked with the numerical designation AIN WTP ###. Supersacks with a spray-painted X on the side contain soil that exhibited PID readings >100 ppm.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location **AIN Water Treatment Plant Upgrade**

No. Construction Observations

Further Action Recommended to Owner

Excavation and containment activities to resume on 8/15.

Attachments

None.

Photographs



Photograph 1: Field-screening and sampling the northeastern sidewall of the expansion area footprint.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 2: The potentially clean soil stockpile at the old airport.



Photograph 3: Contaminated soil remaining onsite at the end of 8/14/2021.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)
8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Report Distribution	Contractor Name and Contact		Weather and Temperature	33 F Rain/Snow wind gusts >20 mph
Client: North Slope Borough	General:	Olgoonik Corporation	Times of Site Visits	
c:	Subcontractors:			from: 07:00 to: 12:00
c:				from: 12:30 to: 17:30
c:				from: to:
Meetings Attended: Morning Safety Meeting			from: to:	

No.	Construction Observations
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1. Topic and Location

Field Screening the Water Treatment Plant Expansion Footprint

Description of Field Activity and Observations

Adam Wyborny (APW) and the Olgoonik Corporation (OC) crew arrived onsite following a morning safety meeting. Containment of the contaminated soil piled at the northeastern end of the expansion area footprint resumed. A second 1,000-gallon holding tank was brought to the site and positioned near the northeastern extent of the footprint. Once the 35-gallon granular activated carbon (GAC) polydrum and the pumps were set up, treatment and containment of the water pooled in the excavation commenced.

By mid-day, all the contaminated soil that had been piled up in the excavation was contained in supersacks. With the northeast corner now exposed, APW field-screened the remaining portions of the northern and eastern sidewalls. Photoionization detector (PID) results were consistent with readings from prior headspace samples. No additional analytical samples were collected.

Immediately following field-screening, a visqueen liner was deployed over the northeast corner and backfilling commenced. The GAC polydrum was clogged with silt during dewatering. The untreated water was consolidated in a small un-backfilled portion of the excavation at the northeast end of the footprint. Dewatering and treatment will resume once the GAC is backwashed.

63 supersacks were filled and transported to the staging area at the old airport on 8/15. The total number of supersacks staged as of this date is **623**. Another four supersacks were filled during site cleanup but not yet transported to the staging area. Final supersack count will be 627.

Further Action Recommended to Owner

Attachments

None.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photographs



Photograph 1: A partial drum exposed while excavating the northeast corner. No discernible odor or trace of fluid observed.



Photograph 2: Treating water pumped from the excavation at the northeast corner of the expansion area footprint.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)
 8/16/2021

DAILY FIELD ACTIVITY REPORT

Project Name/Location	AIN Water Treatment Plant Upgrade
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Photograph 3: Field-screening the remaining portions of the sidewalls at the northeast corner.



Photograph 4: Backfilling the northeast corner of the footprint following excavation and containment of contaminated soil.

LIMITATIONS: The Shannon & Wilson field representative is present on site solely to observe the field activities of the contractor identified and keep our client informed of the progress and quality of the work. The presence and activities of the Shannon & Wilson field representative and our acceptance of any non-conforming work or failure to reject any non-conforming work does not relieve the contractor from complying with its contract documents. Shannon & Wilson does not have the authority to direct the contractor's work. Any information provided by the Shannon & Wilson field inspector is intended solely to advise the contractor of the technical requirements of the plans and specifications and/or design concept. The contractor is solely responsible for its means, methods, sequences, construction site safety, quality of work, and adherence to the contract documents.

REVIEW BY (PM initial/date)

8/16/2021

SCANNED FIELD BOOK

2 8/01/2021 AIN WTP Overcast 54°F

- 07:30 - APW departed for FAI.
- 10:00 - APW arrived in ANC. Flight to BRW was delayed.
- 16:00 - APW arrived in BRW and collected bags.
- 16:30 - APW checked into the King Eider Inn.

End of Day



8/02/2021 AIN WTP Light Rain 52°F 3

- 11:00 - APW checked in at Wright Air Service for flight to AIN.
- 13:00 - APW arrived in AIN and was met at the air strip by Sean, the OC foreman. Sean brought APW to the hotel to check in.
- 13:45 - APW and Sean then visited the OC camp to pick up sampling equipment being stored there.
- 14:00 - APW and Sean arrived at the WTP and met the rest of the OC crew. OC personnel were digging a ditch/berm to divert overflow water from the nearby bulk water tank away from the site. APW staked out the EAIQ hotspot while waiting.
- 15:00 - Excavation with the delineated hotspot area commenced. Material was excavated directly into supersacks. APW field screened the working face.
- 17:15 - Excavation concluded for the day. 18 supersacks were filled.

8/3/21

AIN WTP

Overcast 55°F

- 07:30 - APW arrived onsite. OC personnel arrived shortly after and warmed up equipment.
- 08:00 - Excavation resumed at hot spot EA19.
- 08:30 - 4 supersacks were delivered to the staging area at the old airport.
- 09:45 - 4 more supersacks were delivered to the staging area.
- 10:00 - 4 supersacks were delivered to the staging area.
- 11:30 - 4 supersacks were delivered to the staging area.
- 12:00 - Lunch break
- 12:30 - All personnel returned to the site. Excavation resumed along the eastern face of the WTP. < 10 ppm fill was piled onsite.
- 16:40 - A new area of contamination was discovered 22' NE of the SE corner of the WTP and $\sim 30'$ off the building face. A 10' x 10' was painted to denote the contaminated soil. The Olgonik crew worked around the contamination to pile clean soil.

Onsite Loader Dumps (5.6⁺-cy)

###

- 17:15 - OC personnel secured the site pending resumption of excavation.

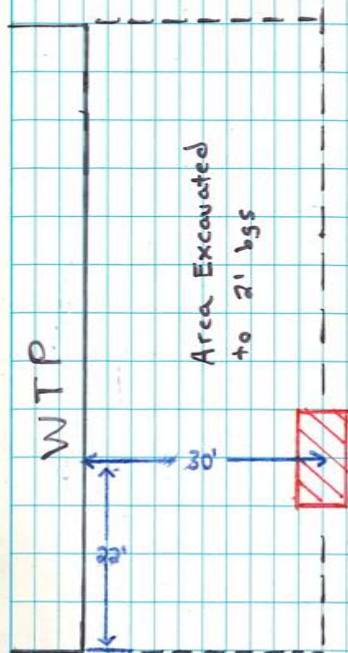
Daily Totals

16 supersacks transported to staging area.

2 supersacks partially filled.

~ 150 to 200 cy of clean surficial gravel stockpiled onsite.

50 headspace samples analyzed.



8/4/2021

AIN WTP

Sunny 60°F

- 07:30 - APW and the OC crew met onsite. The shipping flat and supersack frame were positioned near the contaminated soil identified the previous day. A second operator resumed work excavating the presumed clean area.
- 07:50 - Excavation and containment of the contaminated soil commenced.
- 08:30 - 4 supersacks were filled and delivered to the staging area. Supersacks containing heavily contaminated material were marked with X's and kept separated from the others.
- 09:10 - 4 supersacks were filled and delivered to the staging area.
- 09:50 - 8 supersacks were filled and delivered to the staging area.
- 10:45 - 4 supersacks were filled and delivered to the staging area.
- 11:15 - 4 supersacks were filled and delivered to the staging area.

8/4/2021

AIN WTP

Sunny 60°F

- 12:00 - Lunch break
- 12:30 - Work resumed. Another 4 supersacks were loaded onto the shipping flat and delivered to the staging area.
- 13:30 - 4 supersacks were delivered to the staging area.
- 14:00 - 4 supersacks were delivered to the staging area.
- 14:30 - 4 supersacks were delivered to the staging area.
- 15:00 - 4 supersacks were delivered to the staging area.
- 15:15 - 4 supersacks were delivered to the staging area.
- 15:45 - 4 supersacks were delivered to the staging area.
- 16:15 - 4 supersacks were delivered to the staging area.
- 16:45 - 4 supersacks were delivered to the staging area.
- 17:15 - 4 supersacks were delivered to the staging area.
- 17:30 - The site was secured for the night.
60 total supersacks.
- Rite in the Rain*

8/5/21

AIN WTP

cloudy 54°F

07:30 - APW arrived onsite. OC personnel were loading supersacks onto the shipping flat. Excavation had resumed within the area of known contamination.

09:20 - One supersack tore and spilled some of it's contents to the ground. The torn bag was returned to the excavation and the ground was scraped. All lost material was rebagged along with surficial soil scraped up.

11:00 - APW was informed that the cook at the Olgoonik Hotel had tested positive for COVID-19. Due to the potential for exposure, the hotel was shut down.

12:00 - Lunch break. APW made arrangements to transfer to the Olgoonik mancamp.

12:30 - Excavation and containment of contaminated soil resumed.

16:00 - APW was informed that a COVID-19 test would be required to change lodging.

8/5/21

AIN WTP

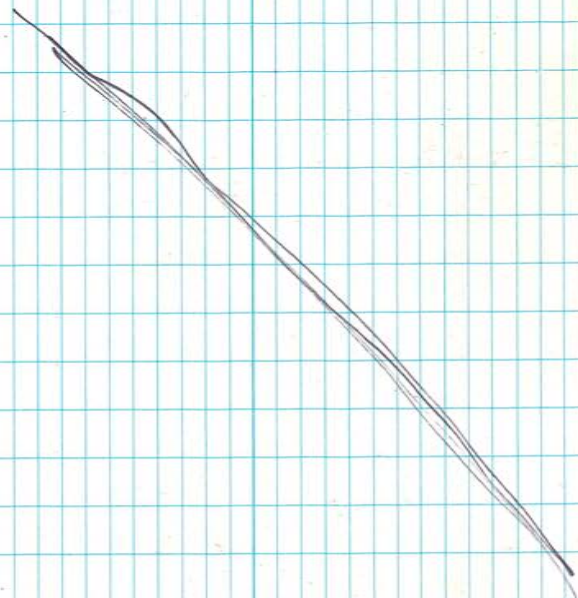
9

Supersack Tally 8/5

 ### ### ### ### ### ### ### ### ### ###

1 101 total

17:30 - Work was completed for the day. APW returned to the hotel and self-isolated.



8/6/21

AIN WTP

45°F Cloudy

- 07:30 - All personnel arrived onsite. OC warmed up equipment and performed routine maintenance.
- 08:00 - Excavation and containment of the contaminated soil resumed.
- 10:30 - PID readings indicated that the excavation was approaching a clean edge on the northern side.
- 12:00 - Lunch break
- 12:30 - Excavation and containment activities resumed.
- 14:00 - Olgonik mandated a COVID-19 test for all personnel. Everyone went to the clinic for a ~~test~~ test.
- 14:45 - All personnel returned to the site and work resumed.
- 15:30 - OC management made the call to shut down the job until the COVID test results came back. The site was secured and all personnel departed. APW returned to the hotel and self-isolated.

8/6/21

AIN WTP

Supersack Tally 8/6

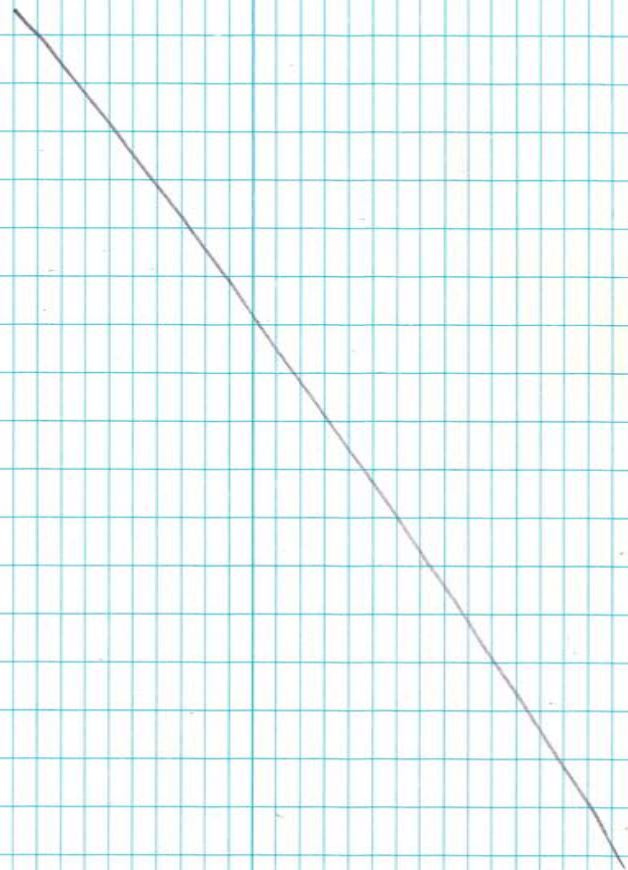
|||| ||| ||| ||| ||| ||| ||| ||| |||

- 1200 - Shawn contacted APW to inform him that enough crew members tested negative to resume operations.
- 1230 - APW returned to the site and observed a substantial amount of water had accumulated in the excavation. An OC operator set to work constructing berms for a lined containment pond.
- 1330 - The containment pond was constructed immediately south of the WTP and pumping began. 4 supersacks loaded on 8/6 were brought to the staging area.
- 1400 - Containment of contaminated soil resumed as pumping continued.
- 1430 - Pumping was completed. Soil containment continued.
- 1730 - Excavation and containment operations concluded for the day. APW transferred lodging over to the OC camp.

Supersack Tally 8/9

##

36 total



8/10/21

AIN WTP

38°F Cloudy

Headspace Sample	Time	PID Result (PPM)
A1	0910	7.5
A2	0911	289.4
A3	0912	450.6
A4	0913	678.4
A5	0914	73.8
A6	0915	19.1
B1	0934	238.8
B2	0935	27.5
B3	0936	37.7
B4	0937	309.5
B5	0938	30.3
B6	0939	6.6
C1	1027	32.1
C2	1028	253.6
C3	1029	80.1
C4	1030	328.7
C5	1031	14.3
C6	1032	27.5
D1	1047	9.5
D2	1048	1.9
D3	1049	47.9
D4	1050	5.1
D5	1051	12.3
D6	1052	8.9

8/10/21

AIN WTP

38°F Cloudy 17

Headspace Sample	Time	PID Result
E1	1117	8.9
E2	1118	5.4
E3	1119	167.5
E4	1120	18.7
E5	1121	30.6
E6	1122	28.7

Base of Excavation Samples

Sample ID	Sample Time Location	Location Face
21 AIN-EB-001	13:20	A2
21 AIN-EB-002	13:25	A3
21 AIN-EB-003/103	13:30	A4
21 AIN-EB-004	13:40	B1
21 AIN-EB-005	13:45	B4
21 AIN-EB-006	13:50	C2
21 AIN-EB-007	13:55	C4
21 AIN-EB-008	14:00	E3
21 AIN-EB-009	14:05	E6

12:30 - All personnel returned from Lunch. Excavation and containment of the contaminated material piled in the excavation resumed. APW began the sample collection process.

15:00 - APW completed collection of the first 9 excavation base samples from the portion of the footprint at finished grade. APW then used the EOS Arrow to collect GPS coordinates for the sample locations.

15:30 - APW began field-screening the southern half of the eastern sidewall which was at the final limits of the overall footprint.

16:00 - APW collected a sidewall sample from the location exhibiting the highest PID reading.

17:15 - Excavation and containment efforts concluded for the day. Routine maintenance was performed on the equipment.

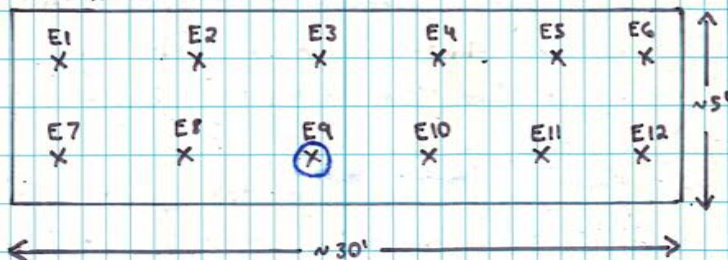
17:30 - All personnel departed the site.

Headspace Sample	Time	PID Result
E1	1534	0.7
E2	1535	1.4
E3	1536	0.6
E4	1537	0.5
E5	1538	14.3
E6	1539	2.6
E7	1540	335.4
E8	1541	318.6
E9	1542	394.2
E10	1543	327.0
E11	1544	73.0
E12	1545	26.7

Excavation Sidewall Sample

21AIN-EW-001 collected @ 16:15

Southern Half of Eastern Sidewall



8/11/21

AIN WTP

33°F Cloudy

0700 - APW and the OC crew arrived onsite.

A laser station was set up to measure the depth of the current excavation.

A morning safety meeting was held.

0730 - Excavation and containment of the piled loose contaminated soil resumed.

0800 - APW attended a project coordination meeting with OC project management.

Shawn Howell, John Ford, Ethan and Chris Darrak in attendance.

~~0800~~ Topics discussed included how to deal with the contained water and what sort of liner needed to be deployed in the excavation to separate the contaminated base from the clean fill. OC also requested that the waste characterization samples collected from the supersacks be submitted on a rush turnaround so that the material could make the barge.

0900 - APW returned to the project site. APW began field-screening random supersacks in preparation for waste characterization sampling.

8/11/21

AIN WTP

33°F Cloudy 21

Supersack Tally 8/11.

III 48 total

Supersack #	Time	PID Result
35	0925	174.6
74	0930	14.7
196	0935	268.3
161	0940	402.4
53	0945	283.8
270	0950	134.8
55	0955	270.5
47	1000	444.3
32	1003	13.2
109	1006	318.4
177	1009	646.1
124	1012	289.3
119	1015	532.3
138	1018	624.0
7	1025	5.4
390	1028	188.9
288	1031	149.2
329	1034	297.1
212	1037	100.6
359	1040	534.7

8/11/21

AIN WTP

36°F Cloudy

Supersack #	Time	PID Result
77	1045	126.9
38	1048	78.3
204	1051	246.7
258	1054	123.8
63	1057	97.6
332	1100	311.4
69	1110	222.7
289	1113	239.8
94	1116	182.5
157	1119	427.3
26	1122	68.6
42	1125	279.2
398	1136	728.3
82	1139	113.9
236	1142	157.8
373	1145	243.6
251	1148	341.1
306	1151	459.6
142	1154	303.8
103	1157	187.9

8/11/21

AIN WTP

36°F Cloudy 23

1200 - Lunch break

1230 - Returned to staging area and resumed screening contained soil.

1300 - APW began collecting waste characterization samples from the supersacks exhibiting the highest PID readings.

- 21AIN-WC-001/101 13:10 Sack # 177
- 21AIN-WC-002 13:15 Sack # 119
- 21AIN-WC-003 13:20 Sack # 138
- 21AIN-WC-004 13:25 Sack # 359
- 21AIN-WC-005 13:30 Sack # 398

1330 - APW returned to the excavation site and field-screened material generated while extending the western sidewall to the footprint limits. Some of this material was heavily contaminated and mixed with material from the ^{NW} ~~NE~~ corner. APW directed all this material to containment.

8/11/2021

AIN WTP

36°F cloudy

1500 - PID results from soil excavated from the ^{NW}~~NE~~ corner working east dropped below 10 ppm. APW continued screening the working face at an increased rate due to borderline readings.

Potentially Clean Truckload Tally (15-cy)

III

16:30 - OC personnel began deploying visqueen over the finished portions of the excavation.

17:30 - All personnel departed the site.



8/12/21

AIN WTP

36°F cloudy²⁵

0700 - All personnel arrived onsite and held a morning safety meeting.

0730 - APW field-screened the southern working face of the excavation and found it to be mostly clean save for one isolated location. All material above the foam board tested < 10 ppm and was used as backfill.

0800 - APW field-screened the base of the base of the excavation on the northern side which had reached the footprint limits on 8/11. This area represents 1,500 square feet. 25 headspace samples were collected. OC personnel set up the GAC filter and began treating water.

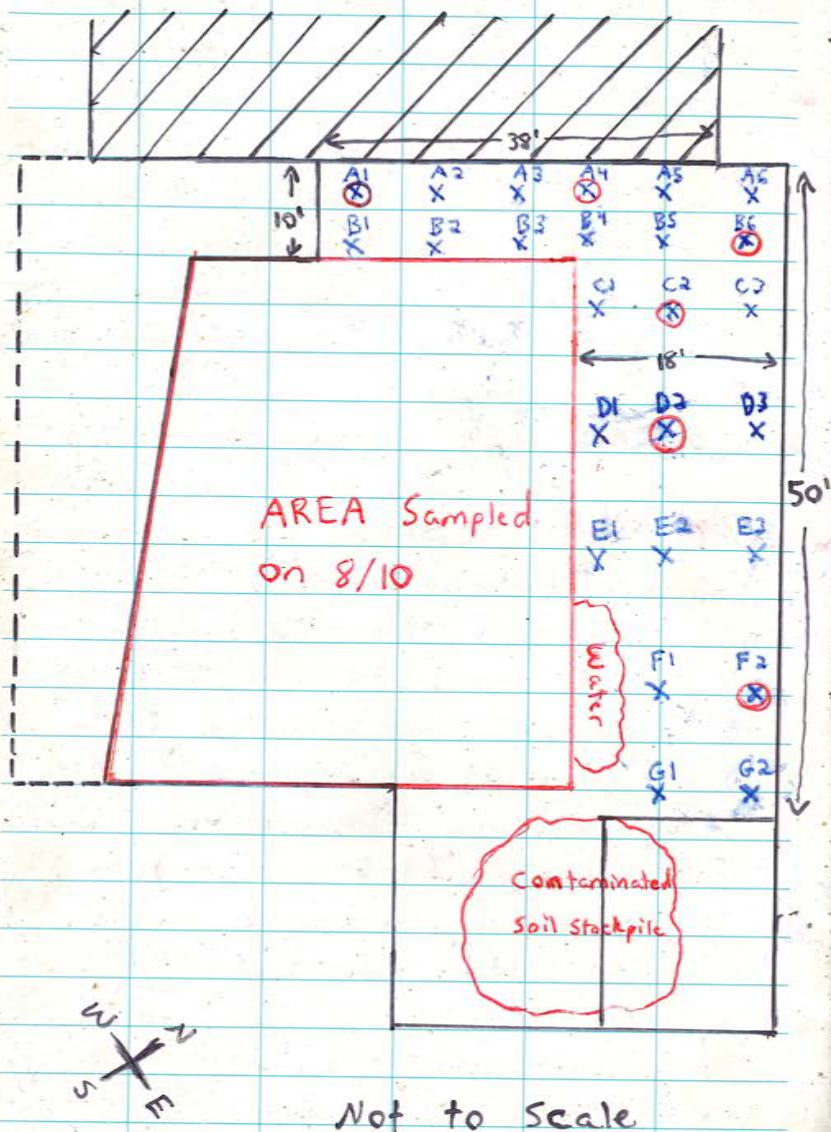
1000 - APW collected 6 base of excavation samples from the 1,500 sf area at the locations exhibiting the highest PID readings plus one sample to show the clean extent.

1030 - APW shot in the sample locations with the EOS Arrow.

8/12/21

AIN WTP

36°F Cloudy



8/12/21

AIN WTP

36°F Cloudy 27

Headspace sample	Time	PID Reading
A1	0800	313.5
A2	0801	64.1
A3	0802	398.2
A4	0803	505.2
A5	0804	91.5
A6	0805	5.7
B1	0808	269.3
B2	0809	40.9
B3	0810	136.1
B4	0811	12.1
B5	0812	62.6
B6	0813	5.4
C1	0816	5.9
C2	0817	551.0
C3	0818	19.9
D1	0819	15.1
D2	0820	157.5
D3	0821	18.9
E1	0825	4.3
E2	0826	8.5
E3	0827	3.8
F1	0828	11.3
F2	0829	648.2
G1	0830	6.1
G2	0831	4.1

Note in the Rain

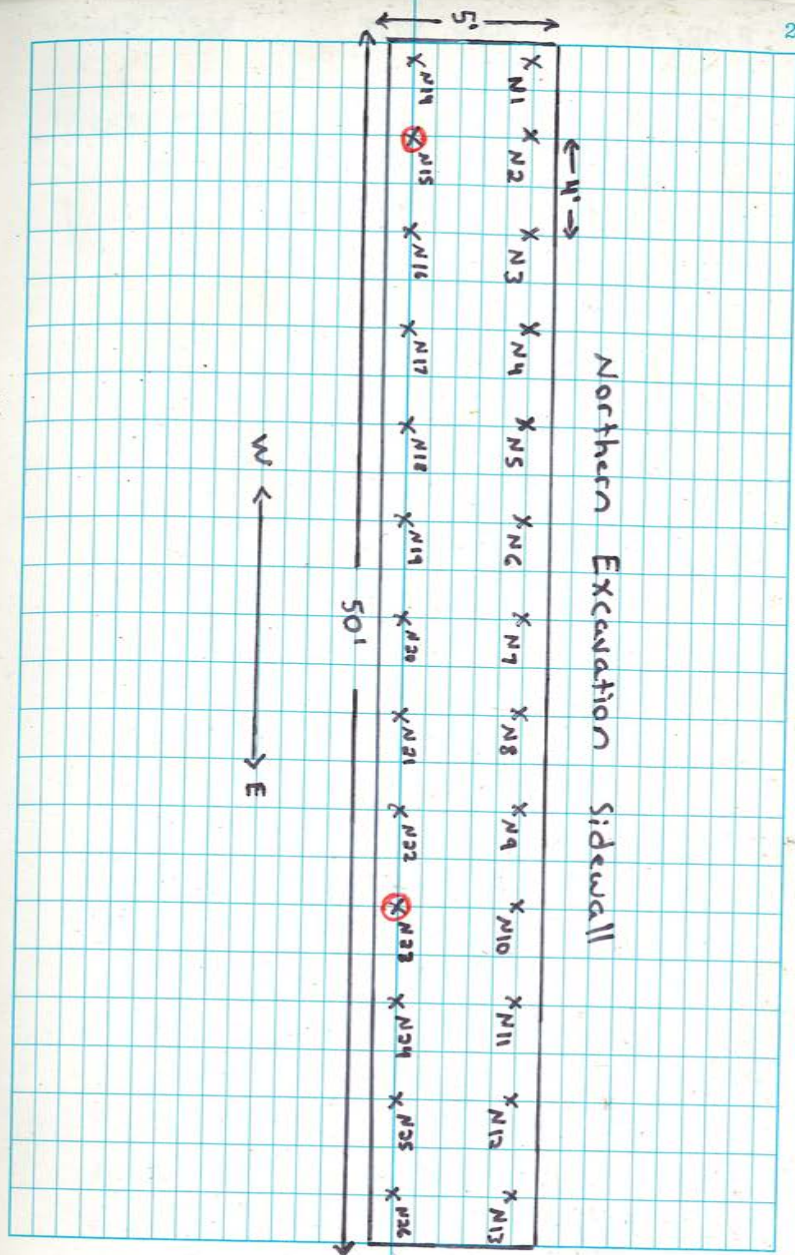
Sample ID	Sample Time	Location
21AIN-EB-010	10:00	A1
21AIN-EB-011	10:05	A4
21AIN-EB-012	10:10	B6
21AIN-EB-013	10:15	C2
21AIN-EB-014	10:20	D2
21AIN-EB-015	10:25	F2

1100 - OC personnel deployed visqueen over the sampled area and began depositing gravel fill. APW worked with an OC operator to screen and excavate the potentially clean material in the southwest quadrant of the footprint.

1200 - Lunch break

1230 - All personnel returned from lunch. APW proceeded to field-screen the 50 exposed linear feet of northern sidewall.

1400 - APW began field-screening the 85 linear feet of western sidewall while continuing to check on soil at the southern extent.



8/12/21

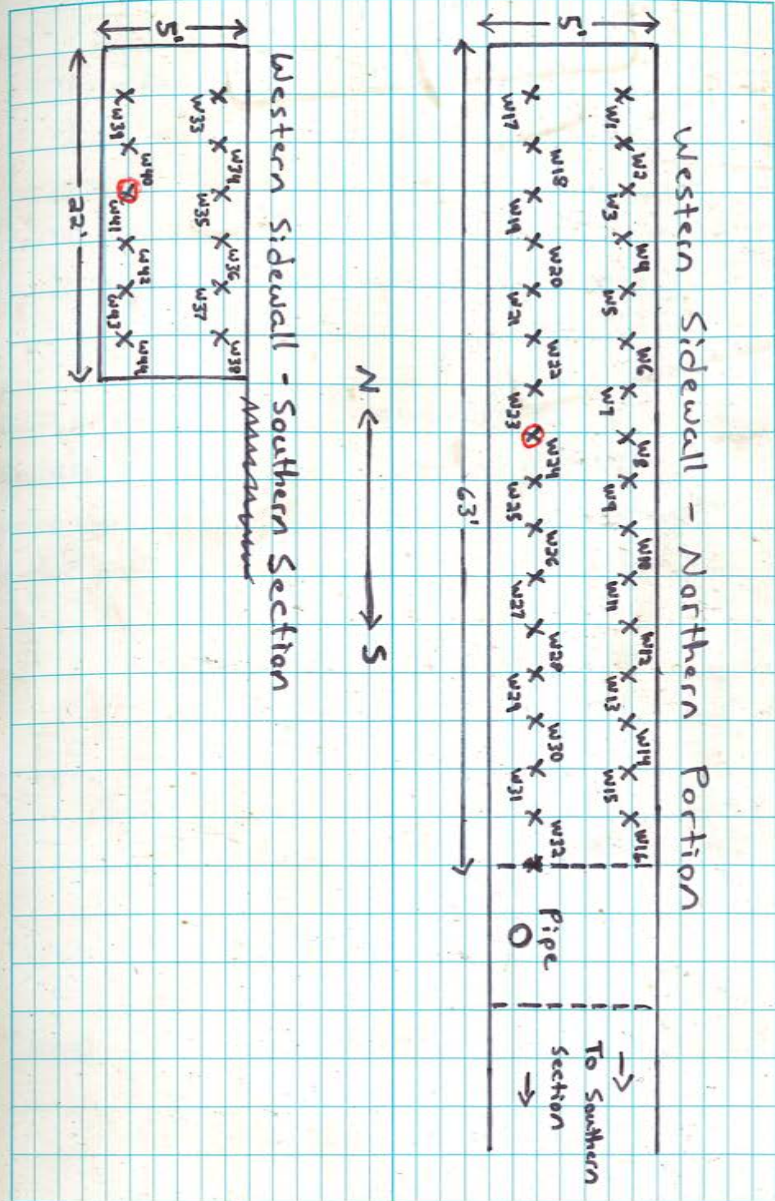
AIN WTP

36°F Cloudy

Headspace sample	Time	PID Result
N 1	1303	1.0
N 2	1304	0.9
N 3	1305	0.6
N 4	1306	0.8
N 5	1307	0.6
N 6	1308	0.7
N 7	1309	0.7
N 8	1310	0.8
N 9	1311	0.6
N 10	1312	0.5
N 11	1313	0.4
N 12	1314	0.9
N 13	1315	0.6
N 14	1317	0.3
<u>N 15</u>	1318	85.5
N 16	1319	1.4
N 17	1320	1.1
N 18	1321	0.7
N 19	1322	0.5
N 20	1323	0.5
N 21	1324	48.8
N 22	1325	428.1
<u>N 23</u>	1326	640.1
N 24	1327	49.1

Headspace Sample	Time	PID Result
N 25	1328	8.7
N 26	1329	2.8
W 1	1415	0.4
W 2	1416	0.8
W 3	1417	0.5
W 4	1418	0.5
W 5	1419	0.4
W 6	1420	0.4
W 7	1421	0.6
W 8	1422	0.9
W 9	1423	0.5
W 10	1424	1.3
W 11	1425	0.4
W 12	1426	1.0
W 13	1427	5.3
W 14	1428	0.5
W 15	1429	0.5
W 16	1430	0.4
W 17	1435	0.6
W 18	1436	1.0
W 19	1437	0.2
W 20	1438	0.5

Headspace Sample	Time	PID Result
W 21	1439	0.3
W 22	1440	1.9
W 23	1441	561.4
<u>W 24</u> Dup	1442	908.4
W 25	1443	632.3
W 26	1444	15.7
W 27	1445	3.9
W 28	1446	17.5
W 29	1447	3.6
W 30	1448	2.5
W 31	1449	1.9
W 32	1450	15.2
W 33	1548	0.8
W 34	1549	0.7
W 35	1550	0.6
W 36	1551	0.5
W 37	1552	0.5
W 38	1553	0.5
W 39	1652	0.4
W 40	1653	0.6
<u>W 41</u>	1654	0.8
W 42	1655	0.5
W 43	1656	0.4
W 44	1657	0.3



- 1600 - APW collected confirmation samples from the northern and western sidewalls.
- 1650 - APW used the EOS Arrow to collect GPS coordinates at the sample locations.

- 21 AIN-EW-002 1610 Northern sidewall
- 21 AIN-EW-003 1615 Northern sidewall
- 21 AIN-EW-004/104 1625 Western sidewall
- 21 AIN-EW-005 1710 Western Sidewall

Potentially Clean Truckloads

||||

- 1730 - All personnel departed the site.

- 0700 - All personnel attended the morning safety meeting at the camp.
- 0730 - All personnel arrived onsite and warmed up equipment. Water treatment resumed and final leveling began at the southern extent. APW field-screened the soil during excavation.
- 0900 - Judging by the size of the onsite contaminated soil pile, APW determined that another waste characterization sample would be required. This sample was taken directly from the pile at a location exhibiting staining and a strong odor.
- 21 AIN-WC-006 collected at 0930

- 0930 - APW prepared sample labels and retrieved water sampling supplies.
- 1100 - APW collected a confirmation sample and field-duplicate sample from the GAC effluent.

36 8/13/21 AIN WTP 38°F Cloudy

- 21AIN-GE-001 collected at 1100
- 21AIN-GE-101 field duplicate

1200 - APW returned to the camp and packed samples for shipment to Fairbanks. Shawn Howell delivered the coolers to the airplane.

1230 - APW returned to the site and began field-screening the far southern sidewall.

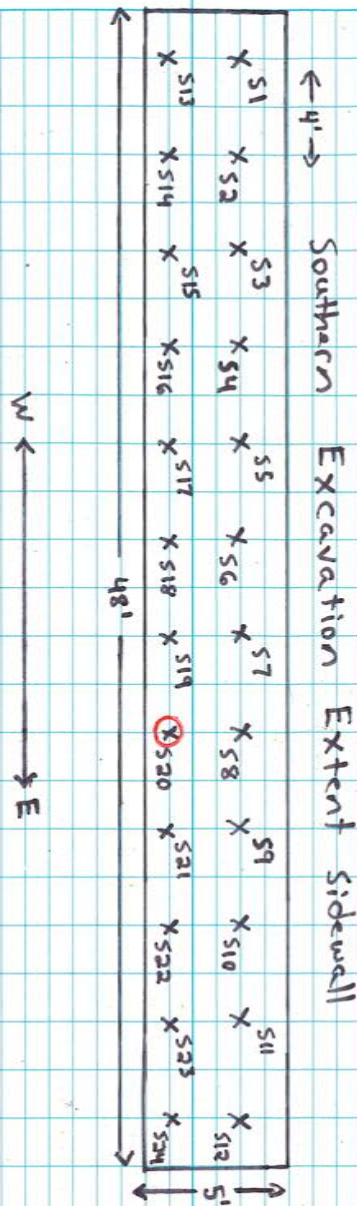
1515 - APW began collecting analytical samples from the excavation base and sidewalls. OC personnel resumed supersacking contaminated soil.

1615 - APW collected GPS locations for the samples using the EOS Arrow. OC personnel deployed visqueen and began backfilling the southern extent as soon as APW finished.

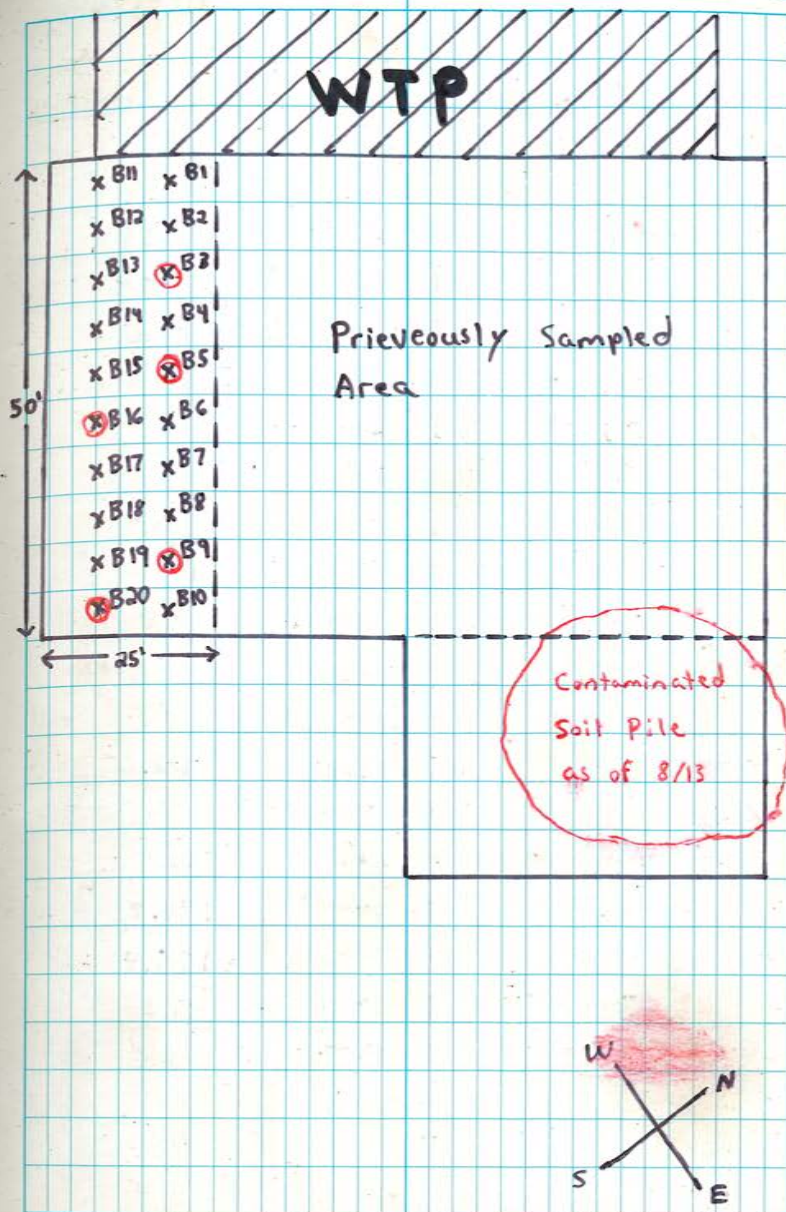
1730 - Backfilling operations continued until the southern extent was filled and compacted.

1745 - All personnel departed the site.

8/13/21 AIN WTP 38°F cloudy 37



Headspace Sample	Time	PID Result
S1	1309	0.4
S2	1310	0.2
S3	1311	0.4
S4	1312	0.5
S5	1313	0.5
S6	1314	0.7
S7	1315	0.5
S8	1316	2.8
S9	1317	0.4
S10	1318	0.4
S11	1319	0.3
S12	1320	0.1
S13	1334	0.2
S14	1335	0.2
S15	1336	0.3
S16	1337	0.2
S17	1338	0.2
S18	1339	0.2
S19	1340	0.3
S20	1341	146.2
S21	1342	36.0
S22	1343	7.9
S23	1344	5.3
S24	1345	13.1



8/13/21

AIN WTP

38°F Cloudy

Headspace Sample	Time	PID Reading
B1	1415	8.9
B2	1416	3.5
B3	1417	429.1
B4	1418	394.4
B5	1419	86.0
B6	1420	26.5
B7	1421	26.7
B8	1422	14.6
B9	1423	181.4
B10	1424	152.7
B11	1425	9.8
B12	1426	6.6
B13	1427	7.7
B14	1428	22.6
B15	1429	51
B16 DUP	1430	510.3
B17	1431	190.8
B18	1432	126.8
B19	1433	97.3
B20	1434	196.0

8/13/21

AIN WTP

38°F Cloudy 41

- 21AIN-EB-016 Collected at 1525 B3
- 21AIN-EB-017 Collected at 1530 B5
- 21AIN-EB-018 Collected at 1535 B9
- 21AIN-EB-019/119 Collected at 1540 B16
- 21AIN-EB-020 Collected at 1545 B20

- 21AIN-EW-006 Collected at 1550 S20

Supersack Tally 8/13

HHH HHH HHH HHH IIII
 24 total

8/14/21

AIN WTP

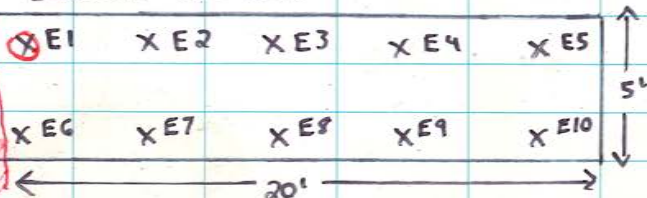
36°F Rain

0700 - All personnel met at the camp for the morning safety meeting.

0730 - All personnel arrived onsite. Equipment was warmed up. Containment of the piled contaminated soil resumed. APW began field-screening the accessible portion of the far eastern sidewall.

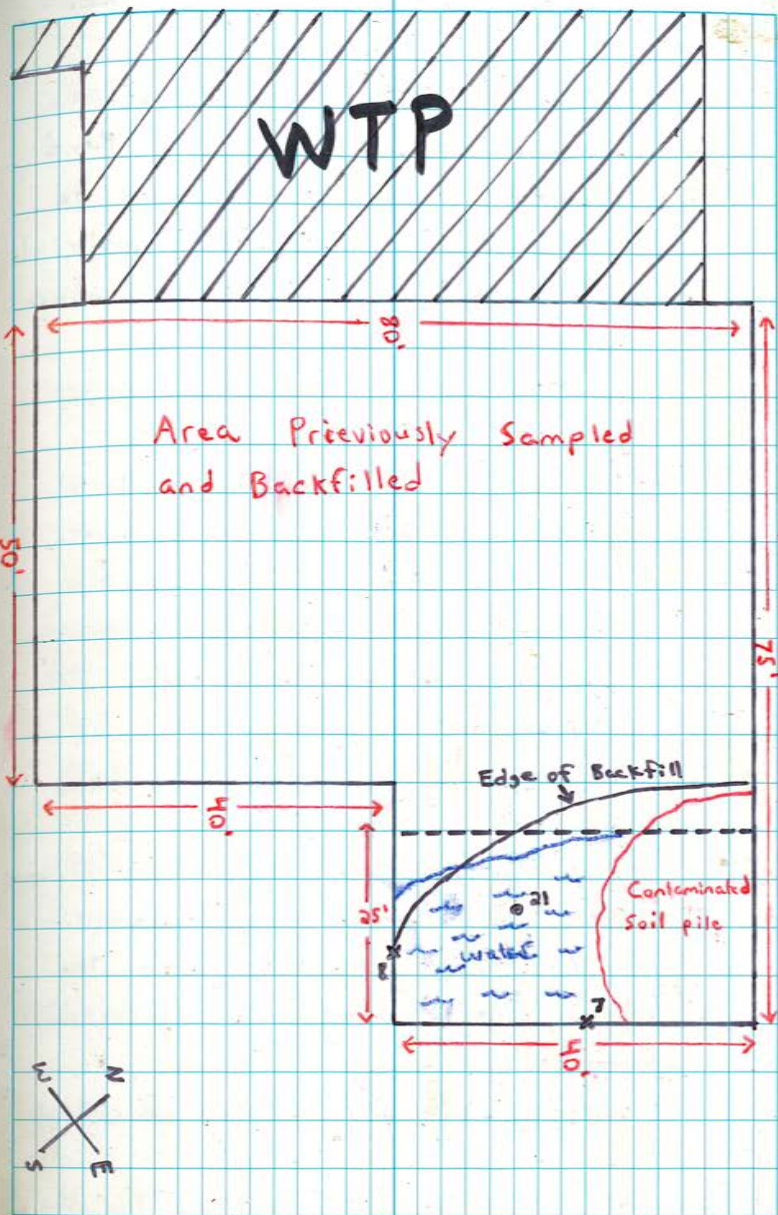
Eastern Sidewall

N ← → S



Headspace Sample	Time	PID Result
E1	0806	75.3
E2	0807	5.2
E3	0808	2.1
E4	0809	1.2
E5	0810	13.0
E6	0811	2.3
E7	0812	7.1
E8	0813	1.3
E9	0814	1.7
E10	0815	2.5

Headspace Sample	Time	PID Result
E1	0806	75.3
E2	0807	5.2
E3	0808	2.1
E4	0809	1.2
E5	0810	13.0
E6	0811	2.3
E7	0812	7.1
E8	0813	1.3
E9	0814	1.7
E10	0815	2.5



8/14/21

AIN WTP

36°F Rain

0820 - With the eastern extent of the footprint submerged, Ethan Reed offered to use the excavator to get a scoop of the base material. APW collected the final excavation base sample from this scoop.

- 21AIN-EB-021 collected at 0825

0850 - Only one location on the eastern sidewall exhibited elevated readings. It is likely that a clean extent was reached but hydrocarbons leached from the contaminated soil pile. This location was sampled.

- 21AIN-EW-007 collected at 0900

0915 - Much of the eastern end of the southern sidewall was covered during backfilling. A small portion remained exposed. The final sidewall sample was collected at this location.

- 21AIN-EW-008 collected at 0920

0930 - APW recorded GPS locations for the samples with the EOS Arrow.

8/14/21

AIN WTP

36°F Rain

0945 - APW went to the potentially clean soil stockpile. The stockpile was estimated at <100-cy. APW collected headspace samples at random locations.

Headspace Sample	Time	PID Result
STKPI 1	1004	48.5
STKPI 2	1007	5.5
STKPI 3	1010	7.6
STKPI 4	1013	5.4
STKPI 5	1016	1.8
STKPI 6	1019	285.9
STKPI 7	1022	9.7
STKPI 8	1025	4.9
STKPI 9	1028	5.9
STKPI 10	1031	5.2

1050 - APW collected 3 confirmation samples and one field duplicate from the locations exhibiting the highest PID readings.

8/14/21

AIN WTP

36°F Rain wind 15

- 21 AIN - STKPL - 001 1055
- 21 AIN - STKPL - 002/102 1100
- 21 AIN - STKPL - 003 1110

1120 - APW returned to the excavation site to observe containment activities.

1200 - Lunch break

1230 - All personnel returned to the site. Containment activities resumed.

1715 - Containment operations concluded for the day. The site was secured for the night.

1730 - All personnel departed the site.

Supersack Tally 8/14

|||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
 ||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||

108 total

8/15/21

AIN WTP

38°F Rain 47

- 0700 - All personnel met at the camp for the morning safety meeting.
- 0730 - All personnel arrived onsite. A second 1,000-gallon holding tank was brought to the site so that the water in the excavation could be treated with GAC and contained.
- 0800 - Containment of contaminated soil resumed.
- 1045 - Dewatering and treatment of the fluid contained in the excavation commenced.
- 1200 - Lunch break
- 1230 - All personnel returned to the site. Containment operations resumed.
- 1415 - Containment of all contaminated soil was completed. APW began field screening the NE corner formerly occupied by the pile. No additional samples required.
- 1500 - Backfilling commenced.
- 1730 - All personnel departed the site.

Supersack Tally 8/15

|||| ||| ||| ||| ||| ||| ||| ||| ||| ||| |||
 ||| ||| ||| |||

8/15/21

AIN WTP

36°F Rain

Headspace Sample	Time	PID Result
E1	1421	4.1
E2	1422	5.4
E3	1423	25.0 upper
E4	1424	71.6
E5	1425	52.8
E6	1426	6.9
E7	1427	18.4
E8	1428	5.0 Lower
E9	1429	2.3
E10	1430	1.1
		N ← → S
N1	1434	4.1
N2	1435	205.2
N3	1436	85.6 upper
N4	1437	81.5
N5	1438	15.4
N6	1439	2.4
N7	1440	5.2
N8	1441	2.7 Lower
N9	1442	66.8
N10	1443	11.4
		W ← → E



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SOIL SEGREGATION FIELD-SCREENING LOGS

SOIL SAMPLE COLLECTION LOG

Project Number: 105401 Project Name: Wainwright Water Treatment Plant upgrade Page 1 of 8
 Date: 8/02/2021
 Sampler: APW Calibration: Fresh air 0.0ppm / 100.0ppm Isobutylene standard

Sample Number	Location	Sample Date	Sample Time	Depth Interval (ft)	Sample Type	PID Reading	Analyses
1	Eastern face of WTP with polygon marked out around EA 19.	8/2/21	15:10	6"	FS	0.2	N/A
2			15:15			0.1	
3			15:20			0.1	
4			15:30			0.4	
5			15:35			4.8	
6			15:45	12"		27.9	
7			15:50			396.7	
8			16:10			32.6	
9			16:15			25.4	
10			16:20			3.7	
11			16:30	18"		6.8	
12			16:35			0.2	
13			16:45			0.1	
14			16:55			0.2	
1	Excavation of upper 2' of gravel fill.	8/3/21	0815	2'	FS	0.3	N/A
2			0818			1.7	
3			0820			3.9	
4			0822	1'		2.3	
5			0824	1'		22.2	
6			0832			0.7	
7			0834			0.6	
8			0850			0.1	
9			0855			0.4	
10			0910			0.5	
11			0920			0.5	
12			0935			0.1	
13			0940			0.2	
14			0945			0.4	
15			0950			100.3	
16			1140			0.8	
17			1141			0.2	
18			1142			0.1	
19			1250			0.5	
20			1252			9.3	
21			1255			0.4	
22			1320			8.4	
23			1321			2.0	
24			1322			0.4	
25			1330			0.4	

Sample Type FS = Field screening measurement only ES = Environmental sample FD = Field duplicate TB = Trip blank EB = Equipment blank FB = Field blank

SOIL SAMPLE COLLECTION LOG

Project Number: 105401

Project Name: Wainwright Water Treatment Plant

Page 2 of 8

Date: 8/3/2021

Sampler: APW

Calibration 0.0 ppm 100.0 ppm Isobutylene standard

Sample Number	Location	Sample Date	Sample Time	Depth Interval (ft)	Sample Type	PID Reading	Analyses
26	Eastern face of WTP. Down to 2' lbs and out 35' horizontally from the building	8/3/21	1332		FS	0.2	N/A
27			1335			0.6	
28			1401			0.4	
29			1402			0.3	
30			1403			3.7	
31			1445			0.4	
32			1447			0.6	
33			1449			0.8	
34			1451			0.4	
35			1500			948.3	
36			1530			3.0	
37			1531			0.6	
38			1532			1.7	
39			1533			1.4	
40			1534			12.7	
41			1548			0.6	
42			1550			1.3	
43			1600			0.1	
44			1605			0.3	
45			1620			1.1	
46	1621			5.1			
47	1630			0.3			
48	1634			4.5			
49	Hotspot 37' NE from SE WTP corner		1640			240.9	
50			1645			2,007	
1	Eastern edge of the expansion area footprint.	8/4/21	0750		FS	25.4	N/A
2			0752			1.7	
3			0803			0.0	
4			0804			0.1	
5			0805			0.6	
6			0806			0.8	
7			0807			1.6	
8			0808			2.4	
9			0826			1.0	
10			0828			0.2	
11			0838			0.8	
12			0840			3.4	
13			0850			0.9	
14			0851			4.8	

Sample Type FS = Field screening measurement only ES = Environmental sample FD = Field duplicate TB = Trip blank EB = Equipment blank FB = Field blank

SOIL SAMPLE COLLECTION LOG

Project Number: 105401 Project Name: Wainwright Water Treatment Plant Page 3 of 8

Date: 8/4/21

Sampler: APW Calibration: Fresh air 0.0 ppm Isobutylene Gas 100.1 ppm

Sample Number	Location	Sample Date	Sample Time	Depth Interval (ft)	Sample Type	PID Reading	Analyses		
15	Eastern edge of the expansion area footprint excavation ↓ EAS ↓	8/4/21	0900		FS	1.8	N/A		
16			0902			130.9			
17			0913			0.8			
18			0914			9.5			
19			0915			76.5			
20			0916			7.8			
21			0917			8.4			
22			0918			102.7			
23	Contaminated soil excavation	8/4/21	0930		FS	0.8 189.5	N/A		
24	↓		0931			9.5	254.8		
25			0932			26.5	496.7		
N			0950				443		
E			0951				223		
S			0952				28.3		
W			0953				762		
B			0954				165		
N			1040				287.7		
E			1041				171.5		
S			1042				5.5		
W			1043				111.3		
B			1044				55.4		
E			1108				81.2		
26					1445			107.2	
27			1700			240.7			
S1	Southern sidewall of contaminated soil excavation	8/5/21	0850		FS	25.5	N/A		
S2	Western sidewall of contaminated soil excavation		0851			5.0			
S3			0852			1.8			
W1			0853				57.0		
W2			0854				280.4		
W3			0855				191.8		
W			1000				392		
S lower			1002				395		
S upper			1004				101.2		
W1			1303				0.8		
W2			1305				228		
W3			1307				22.1		
W4			1309				2.4		
N1					1350			334	

Sample Type FS = Field screening measurement only ES = Environmental sample FD = Field duplicate TB = Trip blank EB = Equipment blank FB = Field blank

SAMPLE COLLECTION LOG

Project Number: 105401 Location: Wainwright Water Treatment Plant Page 4 of 8

Date: 8/5/2021

Sampler: APW

Calibration: Fresh Air 0.0ppm Isobutylene Gas 100.0 ppm

Sample Number	Location	Sample Time	Depth Interval (ft)		Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
			top	bottom					
N2	Northern sidewall	1352			SB	G	FS	318.8	N/A
N3		1418			↓	↓	↓	287	↓
N4		1420			↓	↓	↓	325	↓
N1	Northern sidewall 8/G	0805			SB	G	FS	120.1	N/A
Test pit	Northeast corner of building	0830			↓	↓	↓	30.2	↓
Test pit	"	0850			↓	↓	↓	0.8	↓
N	sidewalls of furthest part	0900			↓	↓	↓	9.3	↓
E	of contaminated soil excavation	0901			↓	↓	↓	3.8	↓
W		0902			↓	↓	↓	35.1	↓
Base		0903			↓	↓	↓	59.4	↓
Base		0925			↓	↓	↓	3.4	↓
W		0926			↓	↓	↓	8.7	↓
N		0927			↓	↓	↓	5.0	↓
N1		0936			↓	↓	↓	4.0	↓
N2		0937			↓	↓	↓	5.9	↓
N3		0938			↓	↓	↓	4.9	↓
N upper layer		0939			↓	↓	↓	0.8	↓
E upper layer		1004			↓	↓	↓	24.7	↓
E Lower layer		1005			↓	↓	↓	18.8	↓
N1		1105			↓	↓	↓	4.6	↓
N2		1106			↓	↓	↓	0.4	↓
N3		1107			↓	↓	↓	0.5	↓

Matrix Type	Sampling Method	Sample Type
AR Air	B Bailor/Coliwas	ES Environmental sample
GW Groundwater	D Drill cuttings	ER Equipment rinsate
PR Product	G Grab sampling	FB Field blank
SB Subsurf. soil	H Hand auger	FD Field duplicate
SE Sediment	L Tube liner	FM Field measurement
SG Sludge	P Pump (liquid)	FR Field replicate
SS Surface soil	SS Split spoon	MD Matrix spike duplicate
SW Surface water	T Shelby tube	MS Matrix spike duplicate
WR Water	V Vacuum (gas)	TB Trip blank
	W Wipe sampling	

SAMPLE COLLECTION LOG

Project Number: 105401 Location: Wainwright Water Treatment Plant Page 5 of 8

Date: 8/6/2021

Sampler: APW

Calibration: Fresh Air 0.0 ppm Isobutylene Gas 100.1 ppm

Sample Number	Location	Sample Time	Depth Interval (ft)		Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
			top	bottom					
S	8/6/21	11:08			SB	G	FS	235.4	N/A
E	↓	11:09			↓	↓	↓	342.3	↓
B	↓	11:10			↓	↓	↓	7.3	↓
— 8/9/21 —									
N1	Northern working face	16:25			SB	G	FS	33.7	N/A
N2	↓	16:26			↓	↓	↓	0.8	↓
N3	↓	16:27			↓	↓	↓	7.6	↓
N4	↓	16:28			↓	↓	↓	54.9	↓
— 8/11/21 —									
FS 1	↓	11:23			SB	G	FS	714.4	N/A
FS 2	↓	11:25			↓	↓	↓	458.1	↓
FS 3	↓	11:40			↓	↓	↓	4.9	↓
FS 4	↓	11:43			↓	↓	↓	153.1	↓
— 8/11/21 —									
NE corner Pile 1	Soil from NE Excavation	13:33			SB	G	FS	59.3	N/A
NE corner Pile 2	corner mixed with western	13:34			↓	↓	↓	36.5	↓
NE corner Base	sidewall. Dirty soil mixed	13:35			↓	↓	↓	9.8	↓
NE corner Pile 3	with potentially clean	13:55			↓	↓	↓	3.3	↓
NE corner Pile 4	when piled.	13:56			↓	↓	↓	96.0	↓
NE corner Pile 5	↓	14:18			↓	↓	↓	8.9	↓
NE corner Pile 6	↓	14:19			↓	↓	↓	60.8	↓
NE corner Pile 7	↓	14:20			↓	↓	↓	2.5	↓
NE corner Pile 8	↓	14:41			↓	↓	↓	45.1	↓
NE corner Pile 9	↓	14:42			↓	↓	↓	26.6	↓
NE corner Pile 10	↓	14:43			↓	↓	↓	11.6	↓
NE corner Pile U	↓	14:44			↓	↓	↓	20.3	↓

Matrix Type		Sampling Method		Sample Type	
AR	Air	B	Bailer/Coliwas	ES	Environmental sample
GW	Groundwater	D	Drill cuttings	ER	Equipment rinsate
PR	Product	G	Grab sampling	FB	Field blank
SB	Subsurf. soil	H	Hand auger	FD	Field duplicate
SE	Sediment	L	Tube liner	FM	Field measurement
SG	Sludge	P	Pump (liquid)	FR	Field replicate
SS	Surface soil	SS	Split spoon	MD	Matrix spike duplicate
SW	Surface water	T	Shelby tube	MS	Matrix spike duplicate
WR	Water	V	Vacuum (gas)	TB	Trip blank
		W	Wipe sampling		

SAMPLE COLLECTION LOG

Project Number: 105401 Location: Wainwright Water Treatment Plant Page 6 of 8
 Date: 8/11/2021
 Sampler: APW

Sample Number	Location	Sample Time	Depth Interval (ft)		Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
			top	bottom					
1	NE corner of Excavation	1458			SB	G	FS	1.0	N/A
2		1459						0.7	
3		1500						8.7	
4		1518						3.1	
5		1519						2.5	
6		1520						72.1	
7		1538						3.4	
8		1553						2.5	
9		1555						1.2	
10		1610						42.2	
11		1611						14.8	
12		1612						2.0	
13		1633						544.3	
14		1634						2.4	
15		1635						2.1	
16		1707						398.7	
17		1708						7.3	
18		1709						6.5	
19	8/12 Northern face	0753						32.5	
20		0754						2.4	

Matrix Type	Sampling Method	Sample Type
AR Air	B Bailor/Coliwas	ES Environmental sample
GW Groundwater	D Drill cuttings	ER Equipment rinsate
PR Product	G Grab sampling	FB Field blank
SB Subsurf. soil	H Hand auger	FD Field duplicate
SE Sediment	L Tube liner	FM Field measurement
SG Sludge	P Pump (liquid)	FR Field replicate
SS Surface soil	SS Split spoon	MD Matrix spike duplicate
SW Surface water	T Shelby tube	MS Matrix spike duplicate
WR Water	V Vacuum (gas)	TB Trip blank
	W Wipe sampling	

SAMPLE COLLECTION LOG

Project Number: 105401		Location: Wainwright Water Treatment Plant		Page 7 of 8					
Date: 8/12/2021									
Sampler: APW Calibration: Fresh Air 0.0 ppm Isobutylene Gas 100.0 ppm									
Sample Number	Location	Sample Time	Depth Interval (ft)		Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
			top	bottom					
S1	Southern working face upper	0735			SB	G	FS	0.7	N/A
S2		0736						0.8	
S3		0737						0.5	
S4		0738						0.8	
S5		0739						0.7	
S6		0740						1.1	
S7	Southern working face lower	0741						0.8	
S8		0742						9.6	
S9		0743						61.0	
S10		0744						2.1	
S11		0745						1.9	
S12		0746						0.9	
SW1	Southwest excavation limits	1123						12.8	
SW2		1124						7.5	
SW3		1125						1.2	
SW4		1126						1.1	
SW5		1140						1.0	
SW6		1241						0.9	
SW7		1336						1.4	
SW8		1337						1.1	
SW9		1417						1.6	
SW10		1418						1.1	
SW11		1419						1.2	
SW12		1510						0.4	
SW13		1511						0.4	

AR	Air	B	Bailer/Colliwas	ES	Environmental sample
GW	Groundwater	D	Drill cuttings	ER	Equipment rinsate
PR	Product	G	Grab sampling	FB	Field blank
SB	Subsurf. soil	H	Hand auger	FD	Field duplicate
SE	Sediment	L	Tube liner	FM	Field measurement
SG	Sludge	P	Pump (liquid)	FR	Field replicate
SS	Surface soil	SS	Split spoon	MD	Matrix spike duplicate
SW	Surface water	T	Shelby tube	MS	Matrix spike duplicate
WR	Water	V	Vacuum (gas)	TB	Trip blank
		W	Wipe sampling		

SAMPLE COLLECTION LOG

Project Number: 105401 Location: Wainwright Water Treatment Plant Page 8 of 8

Date: 8/12/2021

Sampler: APW

Sample Number	Location	Sample Time	Depth Interval (ft)		Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
			top	bottom					
SW 14	SW quadrant of Expansion area footprint ↓	1512			SB	G	FS	0.3	N/A
SW 15		1513			↓	↓	↓	0.3	↓
SW 16		1514			↓	↓	↓	1.0	↓
SW 17		1544			↓	↓	↓	316.9	↓
SW 18		1545			↓	↓	↓	8.6	↓
SW 19		1546			↓	↓	↓	25.4	↓
SW 20		1547			↓	↓	↓	2.2	↓
8/13/2021									
South end 1	Southern Extent of Expansion area footprint ↓	0747			SB	G	FS	1.5	N/A
South end 2		0748			↓	↓	↓	62.3	↓
South end 3		0749			↓	↓	↓	12.5	↓
South end 4		0750			↓	↓	↓	15.2	↓
South end 5		0751			↓	↓	↓	41.8	↓
South end 6		0752			↓	↓	↓	84.9	↓
South end 7		0857			↓	↓	↓	16.2	↓
South end 8		0858			↓	↓	↓	49.9	↓
South end 9		0859			↓	↓	↓	14.0	↓
South end 10		0900			↓	↓	↓	58.2	↓

Matrix Type		Sampling Method		Sample Type	
AR	Air	B	Bailer/Colliwas	ES	Environmental sample
GW	Groundwater	D	Drill cuttings	ER	Equipment rinseate
PR	Product	G	Grab sampling	FB	Field blank
SB	Subsurf. soil	H	Hand auger	FD	Field duplicate
SE	Sediment	L	Tube liner	FM	Field measurement
SG	Sludge	P	Pump (liquid)	FR	Field replicate
SS	Surface soil	SS	Split spoon	MD	Matrix spike duplicate
SW	Surface water	T	Shelby tube	MS	Matrix spike duplicate
WR	Water	V	Vacuum (gas)	TB	Trip blank
		W	Wipe sampling		

ANALYTICAL SAMPLE COLLECTION LOGS

SAMPLE COLLECTION LOG

Project Number: 105401		Location: Wainwright Water Treatment Plant		Page 1 of 3					
Date: 8/10/2021									
Sampler: APW									
Sample Number	Location	Sample Time	Depth Interval (ft)		Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
			top	bottom					
21AIN-EB-001	Excavation base, see field book diagram	1320			SB	G	ES	289.4	GRO/VOCs/DRO/RRO/PAHs
21AIN-EB-002		1325						450.6	
21AIN-EB-003	8/10/21	1330						678.4	
21AIN-EB-004	↓	1340						238.8	
21AIN-EB-005		1345						309.5	
21AIN-EB-006		1350						253.6	
21AIN-EB-007		1355						328.7	
21AIN-EB-008		1400						167.5	
21AIN-EB-009	↓	1405						28.7	
21AIN-EB-010	8/12/21	1000						313.5	
21AIN-EB-011	↓	1005						505.2	
21AIN-EB-012		1010						5.4	
21AIN-EB-013		1015						551.0	
21AIN-EB-014		1020						157.5	
21AIN-EB-015	↓	1025						648.2	
21AIN-EB-016	8/13/21	1525						429.1	
21AIN-EB-017	↓	1530						86.0	
21AIN-EB-018		1535						152.7	
21AIN-EB-019		1540						510.3	
21AIN-EB-020	↓	1545						196.0	
21AIN-EB-021	8/14/21	0825			↓	↓	↓	N/A	↓
21AIN-EB-103	Duplicate of 21AIN-EB-003	1300			SB	G	FD	678.4	GRO/VOCs/DRO/RRO/PAHs
21AIN-EB-119	Duplicate of 21AIN-EB-019	1500			↓	↓	↓	510.3	↓

Matrix Type	Sampling Method	Sample Type
AR Air	B Bailor/Colliwas	ES Environmental sample
GW Groundwater	D Drill cuttings	ER Equipment rinsate
PR Product	G Grab sampling	FB Field blank
SB Subsurf. soil	H Hand auger	FD Field duplicate
SE Sediment	L Tube liner	FM Field measurement
SG Sludge	P Pump (liquid)	FR Field replicate
SS Surface soil	SS Split spoon	MD Matrix spike duplicate
SW Surface water	T Shelby tube	MS Matrix spike duplicate
WR Water	V Vacuum (gas)	TB Trip blank
	W Wipe sampling	

SAMPLE COLLECTION LOG

Project Number: 105401		Location: Wainwright Water Treatment Plant		Page 2 of 3					
Date: 8/10/21									
Sampler: APW									
Sample Number	Location	Sample Time	Depth Interval (ft)		Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
			top	bottom					
21AIN-EW-001	Excavation sidewalls, see field book diagrams.	1615	8/10/2021		SB	G	ES	394.2	GRO/VOCs/DRO/RRO/PAHs
21AIN-EW-002		1610	8/12/2021					85.5	
21AIN-EW-003		1615						640.1	
21AIN-EW-004		1625						908.4	
21AIN-EW-005		1710						0.8	
21AIN-EW-006		1550	8/13/2021					146.2	
21AIN-EW-007		0900	8/14/2021					75.3	
21AIN-EW-008		0920						N/A	
21AIN-EW-104	Duplicate of 21AIN-EW-004	1600	8/12/2021		SB	G	FD	908.4	GRO/VOCs/DRO/RRO/PAHs
21AIN-WC-001	waste characterization 177	1310	8/11/2021		SB	G	ES	646.1	GRO/VOCs/DRO/RRO/PAHs
21AIN-WC-002	samples from supersacks. 119	1315						532.3	
21AIN-WC-003	Supersack 138	1320						624.0	
21AIN-WC-004	Supersack 359	1325						534.7	
21AIN-WC-005	Supersack 398	1330						728.3	
21AIN-WC-006	onsite contaminate soil pile	0930	8/13/2021		SB	G	ES		GRO/VOCs/DRO/RRO/PAHs
21AIN-WC-101	Supersack 177	1300	8/11/2021		SB	G	FD	646.1	GRO/VOCs/DRO/RRO/PAHs
21AIN-GE-001		1100	8/13/2021		WR	G	ES	N/A	GRO/VOCs/DRO/RRO/PAHs
21AIN-GE-101		1050			WR	G	FD	N/A	

Matrix Type	Sampling Method	Sample Type
AR Air	B Bailor/Coliwas	ES Environmental sample
GW Groundwater	D Drill cuttings	ER Equipment rinsate
PR Product	G Grab sampling	FB Field blank
SB Subsurf. soil	H Hand auger	FD Field duplicate
SE Sediment	L Tube liner	FM Field measurement
SG Sludge	P Pump (liquid)	FR Field replicate
SS Surface soil	SS Split spoon	MD Matrix spike duplicate
SW Surface water	T Shelby tube	MS Matrix spike duplicate
WR Water	V Vacuum (gas)	TB Trip blank
	W Wipe sampling	

Appendix B

Data Quality Review

CONTENTS

- Data Quality Summary
- DEC Laboratory Data Review Checklist - Work Order 1215216
- DEC Laboratory Data Review Checklist - Work Order 1215218
- DEC Laboratory Data Review Checklist - Work Order 1215266

QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance (QA)/quality control (QC) procedures assist in producing data of acceptable quality and reliability. Analytical results for laboratory QC samples were reviewed and a QA assessment of the data was conducted as the data were generated. The QA review procedures provided documentation of the accuracy and precision of the analytical data and confirmed that the analyses were sufficiently sensitive to detect analytes at levels below applicable DEC soil CULs, where such levels exist. Shannon & Wilson, Inc. conducted a QA/QC review of the laboratory reports containing data for this submittal. We have provided a summary of our review below. Additional details regarding the data-quality flags applied to the analytical results are detailed in the attached LDRCs included in Appendix B.

SAMPLE HANDLING

Samples collected by Shannon & Wilson personnel were delivered to the SGS receiving office in Fairbanks, AK to perform the requested analyses, using the methods specified in the Chain-of-Custody (COC) records. Sample-receipt forms for SGS were reviewed and checked to verify samples were received in good condition and within the acceptable temperature range. The DEC considers samples received free of ice and at temperatures between 0 °C and 6 °C as acceptable.

Samples were generally received in good condition and properly preserved. COC records were also reviewed to confirm information was complete, custody was not breached, and samples were analyzed within the acceptable holding time. COC records were generally complete and correct except for minor discrepancies that did not affect the data quality. All analyses were performed within their method required holding times.

ANALYTICAL SENSITIVITY

Reported limits of detection (LODs) for regulated analytes were below applicable DEC cleanup levels or discharge criteria for the samples included in these work orders. We note that 1,2,3-trichloropropane was not detected in the treated water sample and was reported at its LOD, which was greater than its associated DEC groundwater CUL. Non-detect results lacking sufficient analytical sensitivity are denoted in bold in the results summary tables.

LABORATORY METHOD BLANKS

Laboratory method blanks (MBs) were analyzed in association with samples collected for this project to check for contributions to the analytical results possibly attributable to

laboratory-based contamination. Field sample results are considered potentially impacted if they are included in the same preparatory batch as an MB exhibiting analyte detections and have corresponding detections for those analytes at concentrations within ten times those of the MB concentrations. Detected results within 5X the MB concentration are assumed to be artifacts of laboratory contamination and are identified with a B-flag. Detected results within 10X the MB concentration are assumed to have a high analytical bias and are flagged JH*. Our review of the analytical results identified the following MB effects on the data:

- Phenanthrene was detected at estimated concentrations the field duplicate water samples *21AIN-GE-001* and *21AIN-GE-101*. The detected concentrations were similar to that of the concentration detected in the associated MB.
- GRO were detected in the excavation extent samples *21AIN-EB-008*, *21AIN-EB-017*, *21AIN-EW-002*, *21AIN-EW-006*, and *21AIN-EW-007* at concentrations within 10X that of the concentration detected in the associated MB.
- GRO were detected in the excavation extent samples *21AIN-EB-009*, *21AIN-EB-012*, *21AIN-EB-014*, *21AIN-EB-021*, *21AIN-EW-003*, *21AIN-EW-005*, and *21AIN-EW-008* at concentrations within 5X that of the concentration detected in the associated MB.
- GRO were detected in the stockpile characterization sample *21AIN-STKPL-102* at a concentration within 10X that of the concentration detected in the associated MB.
- GRO were detected in the stockpile characterization samples *21AIN-STKPL-001* and *21AIN-STKPL-003* at concentrations within 5X that of the concentration detected in the associated MB.

TRIP BLANKS

Trip blanks (TB) were submitted with the samples marked for volatile analyses to verify cross-contamination did not occur during sample handling and transport. As with MBs, field sample results are considered potentially impacted if the detected sample concentration for the analyte found in the TB is within ten times that of the TB concentration. Affected results are identified with a B-flag, denoting potential external analyte contributions. Our review of the analytical results identified the following TB effects on the data:

- The waste characterization samples *21AIN-WC-001*, *21AIN-WC-101*, *21AIN-WC-002*, *21AIN-WC-003*, and *21AIN-WC-006* were affected by one or more of the VOCs 1,2,4-trimethylbenzene, ethylbenzene, n-propylbenzene, xylenes, and toluene which were detected at estimated concentrations in the associated TB.

METHOD ACCURACY AND PRECISION

In order to evaluate the accuracy and precision of the analytical methods, the laboratory analyzed QC samples for each preparatory batch. These QC samples consist of laboratory control samples (LCS) and LCS duplicates (LCSD), laboratory duplicate samples, and matrix spike (MS) and MS duplicates (MSD). We reviewed the results of the laboratory QC samples to verify that the reported accuracy and precision were within acceptable limits. We identified several QC failures which did not affect the data (see LDRCs for details).

SURROGATE RECOVERY

The laboratory spiked the samples analyzed for organic constituents with a known quantity of a surrogate compound similar to the target analytes. The recoveries of these surrogates are provided with the sample results in the associated laboratory reports. We reviewed the provided surrogate recovery information to verify the recoveries were within the control limits for the given method. Our review identified several surrogate recovery failures which affected the data. Sample results affected by elevated surrogate recovery are considered estimated with a high analytical bias and are flagged JH* in the results summary table. Similarly, sample results affected by low surrogate recovery are considered estimated with a low analytical bias and are flagged JL* or J-flagged at the LOD in the results summary table. Our review of the analytical results identified the following surrogate recovery failures:

- The waste characterization samples *21AIN-WC-001*, *21AIN-WC-101*, *21AIN-WC-002*, *21AIN-WC-003*, *21AIN-WC-004*, and *21AIN-WC-005* were affected by elevated surrogate recovery for 4-bromofluorobenzene. The GRO results of these samples are assumed to have a high analytical bias.
- The excavation extent samples *21AIN-EB-001*, *21AIN-EB-002*, *21AIN-EB-003*, *21AIN-EB-103*, *21AIN-EB-005*, *21AIN-EB-010*, *21AIN-EB-011*, *21AIN-EB-013*, *21AIN-EB-015*, *21AIN-EB-016*, *21AIN-EB-018*, *21AIN-EB-019*, *21AIN-EB-119*, *21AIN-EW-001*, *21AIN-EW-004*, and *21AIN-EW-104* were affected by elevated surrogate recovery for 4-bromofluorobenzene. The GRO results of these samples are assumed to have a high analytical bias.
- The waste characterization samples *21AIN-WC-001*, *21AIN-WC-002*, *21AIN-WC-005*, and *21AIN-WC-006* were affected by elevated surrogate recovery for 2-methylnaphthalene-d10. The associated PAH results of these samples are assumed to have a high analytical bias.
- The excavation extent samples *21AIN-EB-003*, *21AIN-EB-010*, *21AIN-EB-016*, *21AIN-EB-017*, *21AIN-EB-019*, *21AIN-EB-119*, *21AIN-EW-001*, *21AIN-EW-004*, and *21AIN-EW-104* were affected by elevated surrogate recovery for 2-methylnaphthalene-d10. The associated PAH results of these samples are assumed to have a high analytical bias.

- The treated water field-duplicate samples 21AIN-GE-001 and 21AIN-GE-101 were affected by low recovery of the surrogates 2-methylnaphthalene-d10 and fluoranthene-d10. All PAH results for these samples are assumed to have a low analytical bias.

SAMPLE REPRESENTATIVENESS

To assess the consistency of the laboratory's analytical method, field-duplicate samples were collected and submitted at a rate of 10 percent of overall samples collected. The field-duplicate results were evaluated by calculating a relative percent difference (RPD) between detected concentrations of each target analyte. The RPD is defined as:

$$RPD(\%) = \frac{(Result\ 1 - Result\ 2)}{\left(\frac{Result\ 1 + Result\ 2}{2}\right)} \times 100$$

The RPDs calculated from the field-duplicate results were compared to the project data quality objective (DQO) of 50 percent maximum difference for soil samples and 30 percent maximum difference for water samples. The results of field-duplicate samples are considered estimated if the RPDs calculated between duplicate results exceeds the relevant DQO. Affected results are J-flagged to identify the imprecision. Our review of the analytical results identified the following RPD failures:

- The dichlorodifluoromethane and several PAH results of the field-duplicate samples 21AIN-WC-001 and 21AIN-WC-101 did not meet the DQO of 50 percent.
- The 4-isopropyltoluene, dichlorodifluoromethane, sec-butylbenzene, and xylenes results of the field-duplicate samples 21AIN-EB-019 and 21AIN-EB-119 did not meet the DQO of 50 percent.
- The 2-methylnaphthalene, GRO, and several VOC results of the field-duplicate samples 21AIN-STKPL-002 and 21AIN-STKPL-102 did not meet the DQO of 50 percent.
- The DRO, 1-methylnaphthalene, and 2-methylnaphthalene results of the field-duplicate samples 21AIN-GE-001 and 21AIN-GE-101 did not meet the DQO of 30 percent.

DATA QUALITY SUMMARY

Based on the methods outlined in the approved CSMP, the samples detailed in the SGS Laboratory work orders 1215216, 1215218, and 1215266 are considered to be representative of site conditions at the locations and times they were obtained. The quality of the analytical data for these samples does not appear to have been compromised by analytical irregularities and results that are affected by QC anomalies are qualified with the appropriate data flags.

DEC LABORATORY DATA REVIEW CHECKLIST

Work Order 1215216

Laboratory Data Review Checklist

Completed By:

Adam Wyborny, PE

Title:

Environmental Engineer

Date:

8/26/2021

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1215216

Laboratory Report Date:

8/25/2021

CS Site Name:

Wainwright WWTP

ADEC File Number:

360.38.006

Hazard Identification Number:

2643

1215216

Laboratory Report Date:

8/25/2021

CS Site Name:

Wainwright WWTP

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

1. Laboratory

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

Yes No N/A Comments:

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

Yes No N/A Comments:

The sample analyses were not sub-contracted to a secondary laboratory.

2. Chain of Custody (CoC)

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

Yes No N/A Comments:

The date was omitted from the two water samples on the CoC, though the intent was to apply the 8/13/2021 date from the previously listed sample to the remaining samples on the page. The laboratory did not note this omission and the correct sample dates were applied to all samples.

The date and time were not listed by the sampler at the time they were relinquished. This is because the cooler was packed and sealed prior to an uncertain arrival time of the airplane. The samples were shipped via Wright Air Service directly to Shannon & Wilson personnel. The samples were then hand delivered to the SGS receiving office in Fairbanks.

b. Correct analyses requested?

Yes No N/A Comments:

3. Laboratory Sample Receipt Documentation

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

Yes No N/A Comments:

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Laboratory Report Date:

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

Yes No N/A Comments:

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

Yes No N/A Comments:

The sample receipt form notes that one of the two 250-mL HCl preserved containers for the field duplicate sample 21AIN-GE-101 was dropped at the laboratory. The laboratory proceeded with the diesel range organics (DRO) and residual range organics (RRO) analyses with limited volume.

The sample receipt form notes that one of the three VOA vials (vial C) included with the water trip blank contained headspace >6 mm.

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

Yes No N/A Comments:

No additional discrepancies were documented by the laboratory beyond those detailed in section 3.c.

e. Data quality or usability affected?

Comments:

The DRO and RRO results of sample 21AIN-GE-101 were not affected by the broken container. Enough sample volume was present in the remaining container to proceed with the analyses.

The water trip blank was not affected by the excess headspace. Vial A was used for the gasoline range organics (GRO) analysis and vial B was used for the volatile organic compounds (VOC) analysis.

4. Case Narrative

a. Present and understandable?

Yes No N/A Comments:

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

Yes No N/A Comments:

The recovery of the method AK101 surrogate 4-bromofluorobenzene was outside of laboratory control limits in the samples 21AIN-WC-001, 21AIN-WC-101, 21AIN-WC-002, 21AIN-WC-003, 21AIN-WC-004, and 21AIN-WC-005. The laboratory attributes these recovery failures to matrix interference.

The recovery of the method SW8270D-SIM surrogate 2-methylnaphthalene-d10 was outside of laboratory control limits in the samples 21AIN-WC-001, 21AIN-WC-002, 21AIN-WC-005, and 21AIN-WC-006. The laboratory attributes these recovery failures to matrix interference.

The recoveries of the method SW8270D-SIM surrogates fluoranthene-d10 and 2-methylnaphthalene-d10 were outside of laboratory control limits in the samples 21AIN-GE-001 and 21AIN-GE-101.

The recoveries for naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene did not meet acceptance criteria in the method SW8270D-SIM matrix spike (MS) and MS duplicate (MSD) associated with preparation batch XXX45410.

c. Were all corrective actions documented?

Yes No N/A Comments:

The samples 21AIN-GE-001 and 21AIN-GE-101 were re-extracted via method SW8270D-SIM outside of the method required holding time following the surrogate recovery failures. Per the laboratory, the re-analysis confirmed the original results, and the within-hold data is reported.

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

Comments:

The case narrative does not specify an effect on data quality/usability; refer to section 6 for further assessment.

5. Samples Results

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

Yes No N/A Comments:

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b. All applicable holding times met?

Yes No N/A Comments:

The samples 21AIN-GE-001 and 21AIN-GE-101 were re-extracted via method SW8270D-SIM outside of the method required holding time. This was done for confirmation purposes and the within-hold results of the initial run are reported.

c. All soils reported on a dry weight basis?

Yes No N/A Comments:

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

Yes No N/A Comments:

The reported limits of detection (LODs) for the soil samples were below their applicable DEC Arctic Zone cleanup levels.

1,2,3-Trichloropropane was not detected in the two water samples and reported at an LOD which exceeded the DEC Groundwater cleanup level. However, we note that the water samples are targeting surface water discharge criteria.

e. Data quality or usability affected?

The data quality/usability are not affected.

6. QC Samples

a. Method Blank

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

Yes No N/A Comments:

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

Yes No N/A Comments:

GRO were detected at an estimated concentration in the AK101 method blank sample associated with preparation batch VXX37679.

GRO were detected at an estimated concentration in the AK101 method blank sample associated with preparation batch VXX37694.

Phenanthrene was detected at an estimated concentration in the SW8270D-SIM method blank sample associated with preparation batch XXX45402.

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

Comments:

Preparation batch VXX37679 includes samples *21AIN-WC-002* and *21AIN-WC-003*. These samples exhibited GRO concentrations greater than 10X that of the concentration detected in the method blank. The results are therefore not affected.

Preparation batch VXX37694 includes samples *21AIN-WC-001*, *21AIN-WC-101*, *21AIN-WC-004*, *21AIN-WC-005*, *21AIN-WC-006* and the trip blank. With the exception of the trip blank, these samples exhibited GRO concentrations greater than 10X that of the concentration detected in the method blank. The results are therefore not affected. The trip blank exhibited a GRO concentration equivalent to that of the concentration detected in the method blank.

Preparation batch XXX45402 includes the samples *21AIN-GE-001* and *21AIN-GE-101*. Both of these samples contained phenanthrene concentrations within 5X that of the concentration detected in the method blank.

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

Yes No N/A Comments:

The GRO result of the soil trip blank is assumed to be an artifact of laboratory contamination and is considered not detected.

The phenanthrene results of samples *21AIN-GE-001* and *21AIN-GE-101* are assumed to be artifacts of laboratory contamination. These results are considered not detected and flagged B* at their reported limits of quantitation (LOQs).

v. Data quality or usability affected?

Comments:

The data quality is affected; see above for applied qualifiers.

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

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

Yes No N/A Comments:

LCS/LCSDs were reported for methods AK101, AK102, and AK103 in both the soil and water matrices. LCS/LCSDs were also reported for method SW8260D in water.

LCSs were reported for methods SW8260D and SW8270D-SIM in both the soil and water matrices.

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

Yes No N/A Comments:

Metals/Inorganics analyses were not requested for these samples.

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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

Comments:

None; method accuracy and, where applicable, precision was demonstrated to be within acceptable limits.

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

Yes No N/A Comments:

The results did not require qualification.

1215216

Laboratory Report Date:

8/25/2021

CS Site Name:

Wainwright WWTP

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

Comments:

The data quality/usability was not affected.

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

Note: Leave blank if not required for project

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

Yes No N/A Comments:

MS/MSD samples were reported for method SW8260D for the soil matrix.
MS/MSD samples were reported for method SW8270D-SIM for both the soil and water matrices.

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

Yes No N/A Comments:

Metals/Inorganics analyses were not requested for these samples.

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

Yes No N/A Comments:

Trichlorofluoromethane was recovered above the laboratory’s upper control limit in the SW8260D MS sample associated with preparation batch VXX37682.
1-Methylnaphthalene, 2-methylnaphthalene, and naphthalene were recovered below the laboratory’s lower control limits in the SW8270D-SIM MS and MSD samples associated with preparation batch XXX45410.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes No N/A Comments:

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

Comments:

The field sample from which the SW8260D MS sample associated with preparation batch VXX37682 was spiked is not included with this sample batch. The potential matrix effects are not applicable to the project samples in this work order.

The MS/MSD samples associated with preparation batch XXX45410 were spiked from the field sample 21AIN-WC-006. The spiking concentrations of the affected polynuclear aromatic hydrocarbons (PAHs) were grossly low compared to the native concentrations in the parent sample. The resulting uncertainty render the results unrepresentative of actual method performance. Results are unaffected.

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

Yes No N/A Comments:

The results of the field samples are not affected; see above.

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

Comments:

The data quality/usability is not affected.

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

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

Yes No N/A Comments:

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

Yes No N/A Comments:

The recovery of the method AK101 surrogate 4-bromofluorobenzene exceeded the laboratory's upper control limits in the samples *21AIN-WC-001*, *21AIN-WC-101*, *21AIN-WC-002*, *21AIN-WC-003*, *21AIN-WC-004*, and *21AIN-WC-005*. The laboratory attributes these recovery failures to matrix interference.

The recovery of the method SW8270D-SIM surrogate 2-methylnaphthalene-d10 was above the laboratory's upper control limits in the samples *21AIN-WC-001*, *21AIN-WC-002*, *21AIN-WC-005*, and *21AIN-WC-006*. The laboratory attributes these recovery failures to matrix interference.

The recoveries of the method SW8270D-SIM surrogates fluoranthene-d10 and 2-methylnaphthalene-d10 were grossly below the laboratory's lower control limits in the samples *21AIN-GE-001* and *21AIN-GE-101*.

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

Yes No N/A Comments:

The GRO results of the samples *21AIN-WC-001*, *21AIN-WC-101*, *21AIN-WC-002*, *21AIN-WC-003*, *21AIN-WC-004*, and *21AIN-WC-005* are assumed to have a high analytical bias. These results are flagged JH* for reporting purposes.

The detected 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene of the samples *21AIN-WC-001*, *21AIN-WC-002*, *21AIN-WC-005*, and *21AIN-WC-006* are assumed to have a high analytical bias and are flagged JH* for reporting purposes. Non-detect results are unaffected by the elevated method recovery.

All PAH results of the samples *21AIN-GE-001* and *21AIN-GE-101* are assumed to have a low analytical bias. Detected concentrations are flagged JL* while non-detect LODs are flagged J*. We opted not to reject the non-detect results because the laboratory reports to have confirmed the results through re-analysis.

- iv. Data quality or usability affected?

Comments:

The data quality is affected; see above for applied qualifiers.

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e. Trip Blanks

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

Yes No N/A Comments:

A trip blank was submitted for both the soil and water matrices.

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

Yes No N/A Comments:

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

Yes No N/A Comments:

1,3,5-Trimethylbenzene, o-xylene, p&m-xylenes, and total xylenes were detected in the soil trip blank at concentrations greater than the LOQ.

1,2,4-Trimethylbenzene, ethylbenzene, n-propylbenzene, toluene, and GRO were detected at estimated concentrations in the soil trip blank.

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

Comments:

Sample 21AIN-WC-001 contained ethylbenzene, n-propylbenzene, and toluene at concentrations within 10X those of the concentrations detected in the trip blank. These results are assumed to have a high analytical bias and are flagged JH* for reporting purposes.

Sample 21AIN-WC-101 contained ethylbenzene and toluene at concentrations within 10X those of the concentrations detected in the trip blank. These results are assumed to have a high analytical bias and are flagged JH* for reporting purposes.

Sample 21AIN-WC-002 contained 1,2,4-trimethylbenzene, ethylbenzene, n-propylbenzene, o-xylene, p&m-xylenes, toluene, and total xylenes at concentrations within 5X those of the concentrations detected in the trip blank. These results may be attributable to sample cross-contamination and are flagged B* for reporting purposes.

Sample 21AIN-WC-003 contained o-xylene, total xylenes, and toluene at concentrations within 10X those of the concentrations detected in the trip blank. These results are assumed to have a high analytical bias and are flagged JH* for reporting purposes. Additionally, ethylbenzene, n-propylbenzene, and p&m-xylenes were detected at concentrations with 5X those of the concentrations detected in the trip blank. These results may be attributable to sample cross-contamination and are flagged B* for reporting purposes.

Sample 21AIN-WC-006 contained 1,2,4-trimethylbenzene at a concentration within 10X that of the concentration detected in the trip blank. This result is assumed to have a high analytical bias and is flagged JH* for reporting purposes. Additionally, ethylbenzene, o-xylene, p&m-xylenes, total xylenes, and toluene were detected at concentrations with 5X those of the concentrations detected in the trip blank. These results may be attributable to sample cross-contamination and are flagged B* for reporting purposes.

v. Data quality or usability affected?

Comments:

The data quality is affected; see above for applied qualifiers.

f. Field Duplicate

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

Yes No N/A Comments:

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ii. Submitted blind to lab?

Yes No N/A Comments:

The soil field duplicate samples *21AIN-WC-001* and *21AIN-WC-101* were submitted with this work order.

The water field duplicate samples *21AIN-GE-001* and *21AIN-GE-101* were submitted with this work order.

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No N/A Comments:

The relative precision demonstrated between the detected results of the field duplicates samples *21AIN-WC-001* and *21AIN-WC-101* was within the recommended DQO of 50% for all analytes except the following: 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)anthracene, benzo[a]pyrene, benzo[b]fluoranthene, chrysene, fluoranthene, naphthalene (both 8260 and 8270), phenanthrene, pyrene, and dichlorodifluoromethane.

The relative precision demonstrated between the detected results of the field duplicates samples *21AIN-GE-001* and *21AIN-GE-101* was within the recommended DQO of 50% for all analytes except the following: 1-methylnaphthalene, 2-methylnaphthalene, and DRO.

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

Comments:

The 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)anthracene, benzo[a]pyrene, benzo[b]fluoranthene, chrysene, fluoranthene, naphthalene (both 8260 and 8270), phenanthrene, pyrene, and dichlorodifluoromethane results of the field duplicate samples *21AIN-WC-001* and *21AIN-WC-101* are considered estimated and flagged J* unless already qualified.

The 1-methylnaphthalene, 2-methylnaphthalene, and DRO results of the field duplicate samples *21AIN-GE-001* and *21AIN-GE-101* are considered estimated and flagged J* unless already qualified.

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

Yes No N/A Comments:

The samples were not collected with reusable equipment. There is therefore no practical potential for analytes to be introduced via field equipment contamination.

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

Yes No N/A Comments:

An equipment blank was not submitted with this work order.

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

Comments:

No samples are affected; see above.

iii. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

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

a. Defined and appropriate?

Yes No N/A Comments:

No additional flags/qualifiers were required.

DEC LABORATORY DATA REVIEW CHECKLIST

Work Order 1215218

APPENDIX B: DATA QUALITY REVIEW

Laboratory Data Review Checklist

Completed By:

Adam Wyborny, PE

Title:

Environmental Engineer

Date:

9/24/2021

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1215218

Laboratory Report Date:

9/09/2021

CS Site Name:

NSB Wainwright Washeteria/Water Plant

ADEC File Number:

360.38.006

Hazard Identification Number:

2643

1215218

Laboratory Report Date:

9/09/2021

CS Site Name:

NSB Wainwright Washeteria/Water Plant

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

1. Laboratory

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

Yes No N/A Comments:

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

Yes No N/A Comments:

The sample analyses were not sub-contracted to a secondary laboratory.

2. Chain of Custody (CoC)

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

Yes No N/A Comments:

The sampler did not note the time and date on the CoC when the samples were shipped due to the cooler being sealed prior to a variable flight schedule. However, the samples were shipped to Shannon & Wilson, Inc. personnel in Fairbanks who hand delivered the samples to the SGS receiving office. Custody was not breached.

b. Correct analyses requested?

Yes No N/A Comments:

3. Laboratory Sample Receipt Documentation

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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

Yes No N/A Comments:

The sample receipt form notes that the samples arrived in good condition.

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

Yes No N/A Comments:

No discrepancies were identified by the laboratory.

e. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

4. Case Narrative

a. Present and understandable?

Yes No N/A Comments:

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

Yes No N/A Comments:

The recovery of the method AK101 surrogate 4-bromofluorobenzene was outside of laboratory control limits in the samples 21AIN-EB-001, 21AIN-EB-002, 21AIN-EB-003, 21AIN-EB-103, 21AIN-EB-005, 21AIN-EB-010, 21AIN-EB-011, 21AIN-EB-013, 21AIN-EB-015, 21AIN-EW-001, 21AIN-EW-004, and 21AIN-EW-104. The laboratory attributes these recovery failures to matrix interference.

The recovery of the method SW8270D-SIM surrogate 2-methylnaphthalene-d10 was outside of laboratory control limits in the samples 21AIN-EB-003, 21AIN-EB-010, 21AIN-EW-001, 21AIN-EW-004, and 21AIN-EW-104. The laboratory attributes these recovery failures to matrix interference.

The EPA method SW8270D-SIM analysis of sample 21AIN-EB-008 was conducted at a dilution due to the dark color of the extract. The dilution resulted in elevated reporting limits.

The recoveries for 1-methylnaphthalene and 2-methylnaphthalene did not meet acceptance criteria in the method SW8270D-SIM matrix spike (MS) and MS duplicate (MSD) associated with preparation batch XXX45428. Additionally, the relative precision demonstrated between the 2-methylnaphthalene recoveries did not meet acceptance criteria.

c. Were all corrective actions documented?

Yes No N/A Comments:

Sample 21AIN-EB-008 was diluted due to the dark color of the extract.

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

Comments:

The case narrative does not specify an effect on data quality/usability; refer to section 6 for further assessment.

5. Samples Results

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

Yes No N/A Comments:

b. All applicable holding times met?

Yes No N/A Comments:

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c. All soils reported on a dry weight basis?

Yes No N/A Comments:

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

Yes No N/A Comments:

The reported limits of detection (LODs) for the soil samples were below their applicable DEC Arctic Zone cleanup levels.

e. Data quality or usability affected?

The data quality/usability are not affected.

6. QC Samples

a. Method Blank

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

Yes No N/A Comments:

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

Yes No N/A Comments:

GRO were detected at an estimated concentration (1.2 J mg/kg) in the AK101 method blank sample associated with preparation batch VXX37694.

GRO were detected at an estimated concentration (1.13 J mg/kg) in the AK101 method blank sample associated with preparation batch VXX37697.

GRO were detected at an estimated concentration (1.07 J mg/kg) in the AK101 method blank sample associated with preparation batch VXX37707.

GRO were detected at an estimated concentration (0.946 J mg/kg) in the AK101 method blank sample associated with preparation batch VXX37717.

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

Comments:

Samples *21AIN-EB-008* and *21AIN-EW-002* are included in preparation batch VXX37694 and contain GRO at concentrations within 10X that of the concentration detected in the associated method blank. Samples *21AIN-EB-009* and *21AIN-EW-003* are also included in preparation batch VXX37694 and contain GRO at concentrations within 5X that of the concentration detected in the associated method blank.

Sample *21AIN-EB-012* is included in preparation batch VXX37697 and contains GRO at a concentration within 5X that of the concentration detected in the associated method blank.

Samples *21AIN-EB-014* and *21AIN-EW-005* are included in preparation batch VXX37707 and contain GRO at concentrations within 5X that of the concentration detected in the associated method blank.

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

Yes No N/A Comments:

The GRO results of samples *21AIN-EB-008* and *21AIN-EW-002* are assumed to have a high analytical bias due to laboratory contributions and are flagged JH* for reporting purposes.

The GRO results of samples *Trip Blank*, *21AIN-EB-009*, *21AIN-EB-012*, *21AIN-EB-014*, *21AIN-EW-003*, and *21AIN-EW-005* are assumed to be artifacts of laboratory contamination and are flagged B* at the LOQ or sample concentration (whichever is greater).

v. Data quality or usability affected?

Comments:

The data quality is affected; see above for applied qualifiers.

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

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

Yes No N/A Comments:

LCS/LCSDs were reported for methods AK101, AK102, and AK103.

LCSs were reported for methods SW8260D and SW8270D-SIM. See MS/MSD discussion for assessment of method precision.

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

Yes No N/A Comments:

Metals/Inorganics analyses were not requested for these samples.

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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

Comments:

None; method accuracy and, where applicable, precision was demonstrated to be within acceptable limits.

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

Yes No N/A Comments:

The results did not require qualification.

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

Comments:

The data quality/usability was not affected.

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

Note: Leave blank if not required for project

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

Yes No N/A Comments:

MS/MSD samples were reported for methods SW8260D and SW8270D-SIM.

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

Yes No N/A Comments:

Metals/Inorganics analyses were not requested for these samples.

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

Yes No N/A Comments:

1-Methylnaphthalene, 2-methylnaphthalene, and naphthalene were recovered below the laboratory's lower control limits in the SW8270D-SIM MS and MSD samples associated with preparation batch XXX45410.

1-Methylnaphthalene and 2-methylnaphthalene were recovered above the laboratory's upper control limits in the SW8270D-SIM MSD sample associated with preparation batch XXX45428.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes No N/A Comments:

The relative precision demonstrated between the 2-methylnaphthalene recoveries of the MS and MSD samples associated with preparation batch XXX45428 did not meet acceptance criteria.

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

Comments:

The MS/MSD samples associated with preparation batch XXX45410 were spiked from a field sample that is not included in this sample batch. Additionally, the spiking concentrations of the affected polynuclear aromatic hydrocarbons (PAHs) were low compared to the native concentrations in the parent sample. The resulting uncertainty may render the results unrepresentative of actual method performance. Results are unaffected.

The MS/MSD samples associated with preparation batch XXX45428 were spiked from the field sample 21AIN-EB-014. However, the 1-methylnaphthalene and 2-methylnaphthalene spiking concentrations were low compared to the native concentrations in the parent sample. The resulting uncertainty may render the results unrepresentative of actual method performance. Results are unaffected.

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

Yes No N/A Comments:

The results of the field samples are not affected; see above.

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

Comments:

The data quality/usability is not affected.

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

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

Yes No N/A Comments:

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

Yes No N/A Comments:

The recovery of the method AK101 surrogate 4-bromofluorobenzene was outside of laboratory control limits in the samples 21AIN-EB-001, 21AIN-EB-002, 21AIN-EB-003, 21AIN-EB-103, 21AIN-EB-005, 21AIN-EB-010, 21AIN-EB-011, 21AIN-EB-013, 21AIN-EB-015, 21AIN-EW-001, 21AIN-EW-004, and 21AIN-EW-104. The laboratory attributes these recovery failures to matrix interference.

The recovery of the method SW8270D-SIM surrogate 2-methylnaphthalene-d10 was outside of laboratory control limits in the samples 21AIN-EB-003, 21AIN-EB-010, 21AIN-EW-001, 21AIN-EW-004, and 21AIN-EW-104. The laboratory attributes these recovery failures to matrix interference.

- 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 GRO results of the samples 21AIN-EB-001, 21AIN-EB-002, 21AIN-EB-003, 21AIN-EB-103, 21AIN-EB-005, 21AIN-EB-010, 21AIN-EB-011, 21AIN-EB-013, 21AIN-EB-015, 21AIN-EW-001, 21AIN-EW-004, and 21AIN-EW-104 are assumed to have a high analytical bias. These results are flagged JH* unless previously qualified for the method blank detection.

The detected 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene of the samples 21AIN-EB-003, 21AIN-EB-010, 21AIN-EW-001, 21AIN-EW-004, and 21AIN-EW-104 are assumed to have a high analytical bias and are flagged JH* for reporting purposes. Non-detect results are unaffected by the elevated method recovery.

- iv. Data quality or usability affected?

Comments:

The data quality is affected; see above for applied qualifiers.

- e. Trip Blanks

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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

Yes No N/A Comments:

GRO were detected at an estimated concentration in the trip blank sample submitted with this work order. However, the trip blank was included in the same preparation batch as a method blank exhibiting an equivalent detection. The trip blank detection is likely an artifact of laboratory contamination.

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

Comments:

The GRO results of the field samples were previously qualified for a similar method blank detection. Additional qualification is not required.

v. Data quality or usability affected?

Comments:

The data quality is not affected; see above.

f. Field Duplicate

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

Yes No N/A Comments:

ii. Submitted blind to lab?

Yes No N/A Comments:

The field duplicate pairs 21AIN-EB-003 / 21AIN-EB-103 and 21AIN-EW-004 / 21AIN-EW-104 were submitted with this work order.

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No N/A Comments:

The relative precision demonstrated between the detected results of the field duplicates samples was within the recommended DQO of 50% for all analytes.

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

Comments:

The data quality/usability is not affected.

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

Yes No N/A Comments:

The samples were not collected with reusable equipment. There is therefore no practical potential for analytes to be introduced via field equipment contamination.

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

Yes No N/A Comments:

An equipment blank was not submitted with this work order.

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

Comments:

No samples are affected; see above.

iii. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

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

a. Defined and appropriate?

Yes No N/A Comments:

No additional flags/qualifiers were required.

DEC LABORATORY DATA REVIEW CHECKLIST

Work Order 1215266

APPENDIX B: DATA QUALITY REVIEW

Laboratory Data Review Checklist

Completed By:

Adam Wyborny, PE

Title:

Environmental Engineer

Date:

9/15/2021

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1215266

Laboratory Report Date:

9/13/2021

CS Site Name:

Wainwright WWTP

ADEC File Number:

360.38.006

Hazard Identification Number:

2643

1215266

Laboratory Report Date:

9/13/2021

CS Site Name:

Wainwright WWTP

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

1. Laboratory

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

Yes No N/A Comments:

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

Yes No N/A Comments:

The sample analyses were not sub-contracted to a secondary laboratory.

2. Chain of Custody (CoC)

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

Yes No N/A Comments:

b. Correct analyses requested?

Yes No N/A Comments:

3. Laboratory Sample Receipt Documentation

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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9/13/2021

CS Site Name:

Wainwright WWTP

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

Yes No N/A Comments:

The sample receipt form notes that the samples arrived in good condition.

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

Yes No N/A Comments:

No discrepancies were identified by the laboratory.

e. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

4. Case Narrative

a. Present and understandable?

Yes No N/A Comments:

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

Yes No N/A Comments:

The recovery of the method AK101 surrogate 4-bromofluorobenzene was outside of laboratory control limits in the samples *21AIN-EB-016*, *21AIN-EB-018*, *21AIN-EB-019*, and *21AIN-EB-119*. The laboratory attributes these recovery failures to matrix interference.

The recovery of the method SW8270D-SIM surrogate 2-methylnaphthalene-d10 was outside of laboratory control limits in the samples *21AIN-EB-016*, *21AIN-EB-017*, *21AIN-EB-018*, *21AIN-EB-019*, and *21AIN-EB-119*. The laboratory attributes these recovery failures to matrix interference.

The method SW8270D-SIM analyses of samples *21AIN-EB-017*, *21AIN-EB-018*, *21AIN-EB-019*, and *21AIN-EB-119* reported elevated limits of quantitation (LOQs) due to sample dilution.

The sample *21AIN-EW-008* was included in the same preparation batch as a continuing calibration verification (CCV) sample exhibiting a recovery failure for trichlorofluoromethane.

The recoveries for 1,1,2-trichloroethane and hexachlorobutadiene did not meet acceptance criteria in the method SW8260D matrix spike (MS) and MS duplicate (MSD) associated with preparation batch VXX37699.

c. Were all corrective actions documented?

Yes No N/A Comments:

Samples *21AIN-EB-017*, *21AIN-EB-018*, *21AIN-EB-019*, and *21AIN-EB-119* were diluted due to the dark color of the extract and/or high concentrations of non-target compounds.

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

Comments:

The case narrative does not specify an effect on data quality/usability; refer to section 6 for further assessment.

5. Samples Results

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

Yes No N/A Comments:

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b. All applicable holding times met?

Yes No N/A Comments:

c. All soils reported on a dry weight basis?

Yes No N/A Comments:

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

Yes No N/A Comments:

The reported limits of detection (LODs) for the soil samples were below their applicable DEC Arctic Zone cleanup levels.

e. Data quality or usability affected?

The data quality/usability are not affected.

6. QC Samples

a. Method Blank

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

Yes No N/A Comments:

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

Yes No N/A Comments:

GRO were detected at an estimated concentration (1.13 J mg/kg) in the AK101 method blank sample associated with preparation batch VXX37697.
GRO were detected at an estimated concentration (1.07 J mg/kg) in the AK101 method blank sample associated with preparation batch VXX37707.

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

Comments:

Samples *21AIN-EW-006* and *21AIN-EW-007* are included in preparation batch VXX37697 and contain GRO at concentrations within 10X that of the concentration detected in the associated method blank. Samples *21AIN-EB-021*, *21AIN-EW-008*, and *21AIN-STKPL-001* are also included in preparation batch VXX37697 and contain GRO at concentrations within 5X that of the concentration detected in the associated method blank.

Samples *21AIN-EB-017* and *21AIN-STKPL-102* are included in preparation batch VXX37707 and contain GRO at concentrations within 10X that of the concentration detected in the associated method blank. The samples *21AIN-STKPL-003* and *Trip Blank* are also included in preparation batch VXX37697 and contains a GRO concentration within 5X that of the concentration detected in the associated method blank.

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

Yes No N/A Comments:

The GRO results of samples *21AIN-EW-006*, *21AIN-EW-007*, *21AIN-EB-017*, and *21AIN-STKPL-102* are assumed to have a high analytical bias due to laboratory contributions and are flagged JH* for reporting purposes.

The GRO results of samples *Trip Blank*, *21AIN-EB-021*, *21AIN-EW-008*, *21AIN-STKPL-001*, and *21AIN-STKPL-003* are assumed to be artifacts of laboratory contamination and are flagged B* at the LOQ or sample concentration (whichever is greater).

v. Data quality or usability affected?

Comments:

The data quality is affected; see above for applied qualifiers.

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

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

Yes No N/A Comments:

LCS/LCSDs were reported for methods AK101, AK102, and AK103.

LCSs were reported for methods SW8260D and SW8270D-SIM. See MS/MSD discussion for assessment of method precision.

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

Yes No N/A Comments:

Metals/Inorganics analyses were not requested for these samples.

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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

Comments:

None; method accuracy and, where applicable, precision was demonstrated to be within acceptable limits.

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

Yes No N/A Comments:

The results did not require qualification.

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

Comments:

The data quality/usability was not affected.

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

Note: Leave blank if not required for project

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

Yes No N/A Comments:

MS/MSD samples were reported for methods SW8260D and SW8270D-SIM.

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

Yes No N/A Comments:

Metals/Inorganics analyses were not requested for these samples.

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

Yes No N/A Comments:

1,1,2-Trichloroethane and hexachlorobutadiene were recovered above the laboratory's upper control limits in the SW8260D MS and MSD samples associated with preparation batch VXX37699.

Trichlorofluoromethane was recovered above the laboratory's upper control limit in the SW8260D MS sample associated with preparation batch VXX37709.

1-Methylnaphthalene and 2-methylnaphthalene were recovered above the laboratory's upper control limits in the SW8270D-SIM MSD sample associated with preparation batch XXX45428.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes No N/A Comments:

The relative precision demonstrated between the 2-methylnaphthalene recoveries of the MS and MSD samples associated with preparation batch XXX45428 did not meet acceptance criteria.

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

Comments:

The field sample from which the SW8260D MS/MSD samples associated with preparation batch VXX37699 were spiked is not included with this sample batch. The potential matrix effects are not applicable to the project samples in this work order.

The field sample from which the SW8260D MS sample associated with preparation batch VXX37709 was spiked is not included with this sample batch. The potential matrix effects are not applicable to the project samples in this work order.

The MS/MSD samples associated with preparation batch XXX45428 were spiked from a field sample that is not included in this sample batch. Additionally, the spiking concentrations of the affected polynuclear aromatic hydrocarbons (PAHs) were low compared to the native concentrations in the parent sample. The resulting uncertainty render the results unrepresentative of actual method performance. Results are unaffected.

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

Yes No N/A Comments:

The results of the field samples are not affected; see above.

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

Comments:

The data quality/usability is not affected.

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

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

Yes No N/A Comments:

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

Yes No N/A Comments:

The recovery of the method AK101 surrogate 4-bromofluorobenzene exceeded the laboratory's upper control limits in the samples *21AIN-EB-016*, *21AIN-EB-018*, *21AIN-EB-019*, and *21AIN-EB-119*. The laboratory attributes these recovery failures to matrix interference.

The recovery of the method SW8270D-SIM surrogate 2-methylnaphthalene-d10 was above the laboratory's upper control limits in the samples *21AIN-EB-016*, *21AIN-EB-017*, *21AIN-EB-019*, and *21AIN-EB-119*. The laboratory attributes these recovery failures to matrix interference.

The recovery of method SW8260D surrogate 2-bromofluorobenzene was recovered below the laboratory's lower control limit for the MS and MSD samples associated with preparatory batch VXX37713.

- 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 GRO results of the samples *21AIN-EB-016*, *21AIN-EB-018*, *21AIN-EB-019*, and *21AIN-EB-119* are assumed to have a high analytical bias. These results are flagged JH* for reporting purposes.

The detected 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, and phenanthrene of the samples *21AIN-EB-016*, *21AIN-EB-017*, *21AIN-EB-019*, and *21AIN-EB-119* are assumed to have a high analytical bias and are flagged JH* for reporting purposes. Non-detect results are unaffected by the elevated method recovery.

The MS/MSD recoveries associated with preparatory batch VXX37713 were within the acceptable limits. These results are not affected by the MS/MSD surrogate recovery failures.

- iv. Data quality or usability affected?

Comments:

The data quality is affected; see above for applied qualifiers.

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e. Trip Blanks

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

Yes No N/A Comments:

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

Yes No N/A Comments:

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

Yes No N/A Comments:

GRO were detected at an estimated concentration in the trip blank sample submitted with this work order.

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

Comments:

The GRO results of the field samples were previously qualified for a similar method blank detection. Additional qualification is not required.

- v. Data quality or usability affected?

Comments:

The data quality is not affected; see above.

f. Field Duplicate

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

Yes No N/A Comments:

- ii. Submitted blind to lab?

Yes No N/A Comments:

The field duplicate pairs 21AIN-EB-019 / 21AIN-EB-119 and 21AIN-STKPL-002 / 21AIN-STKPL-102 were submitted with this work order.

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No N/A Comments:

The relative precision demonstrated between the detected results of the field duplicates samples *21AIN-EB-019* and *21AIN-EB-119* was within the recommended DQO of 50% for all analytes except the following: 4-isopropyltoluene, dichlorodifluoromethane, o-xylene, p&m-xylenes, total xylenes, and sec-butylbenzene.

The relative precision demonstrated between the detected results of the field duplicates samples *21AIN-STKPL-002* and *21AIN-STKPL-102* was within the recommended DQO of 50% for all analytes except the following: 2-methylnaphthalene, GRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-isopropyltoluene, isopropylbenzene (cumene), n-propylbenzene, sec-butylbenzene, and tert-butylbenzene.

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

Comments:

The 4-isopropyltoluene, dichlorodifluoromethane, o-xylene, p&m-xylenes, tot xylenes, and sec-butylbenzene results for field duplicate samples *21AIN-EB-019* and *21AIN-EB-119* are considered estimated and flagged J* unless already qualified.

The 2-methylnaphthalene, GRO, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-isopropyltoluene, isopropylbenzene, n-propylbenzene, sec-butylbenzene, and tert-butylbenzene results for field duplicate samples *21AIN-STKPL-002* and *21AIN-STKPL-102* are considered estimated and flagged J* unless already qualified.

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

Yes No N/A Comments:

The samples were not collected with reusable equipment. There is therefore no practical potential for analytes to be introduced via field equipment contamination.

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

Yes No N/A Comments:

An equipment blank was not submitted with this work order.

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

Comments:

No samples are affected; see above.

iii. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

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

a. Defined and appropriate?

Yes No N/A Comments:

No additional flags/qualifiers were required.

Appendix C

Water Management Proposal

CONTENTS

- Email correspondence detailing the water management proposal and subsequent approval.

From: [Adam Wyborny](#)
To: [Krebs-Barsis, Lisa K \(DEC\)](#)
Cc: [Chris Darrah](#); [Steven Decker](#); [John Ford](#)
Subject: RE: Wainwright WTP Proposed Water Management Approach
Date: Wednesday, August 18, 2021 1:42:00 PM
Attachments: [image002.png](#)
[image003.png](#)
[image004.png](#)

Thanks Lisa, will do. The samples were submitted to SGS on Monday. SGS is a little overstretched at the moment so they wouldn't commit to a 5-day turnaround, only that they would do what they can for us. I will provide you a copy of the results once I receive them.

-Adam

From: Krebs-Barsis, Lisa K (DEC) <lisa.krebs-barsis@alaska.gov>
Sent: Wednesday, August 18, 2021 12:05 PM
To: Adam Wyborny <APW@shanwil.com>
Cc: Chris Darrah <CBD@shanwil.com>; Steven Decker <Steven.Decker@north-slope.org>; John Ford <Jford@olgoonik.com>
Subject: RE: Wainwright WTP Proposed Water Management Approach

Thank you for the explanation, I hope everyone is healthy and safe.

I discussed this with Chris in our call Monday. Excavation dewatering is a permitted activity over which the Division of SPAR has authority when work is being conducted under Article 3 of 18 AAC 75. I asked during the work plan approval if dewatering would be needed and was told it would not be needed. I understand that conditions in the field change, but the requirement for coordination and authorization does not. If you unexpectedly need to dewater an excavation you need to contact the department and coordinate. If your SPAR project manager is on leave, as I was for much of last week, you can contact the SPAR project manager's supervisor or the person the project manager has delegated to.

Your plan looks good. We might have to coordinate with DOW in addition to the City if you want to discharge the water to the lagoon. I'll try to figure out who is the DEC contact for the lagoon permit to make sure this is an acceptable waste stream. Let me know when you receive the results of the sampling.

Lisa Krebs-Barsis
Contaminated Sites Program
Alaska Department of Environmental Conservation
269-7691

From: Adam Wyborny [<mailto:APW@shanwil.com>]
Sent: Wednesday, August 18, 2021 11:44 AM
To: Krebs-Barsis, Lisa K (DEC) <lisa.krebs-barsis@alaska.gov>
Cc: Chris Darrah <CBD@shanwil.com>; Steven Decker <Steven.Decker@north-slope.org>; John Ford

<Jford@olgoonik.com>

Subject: Wainwright WTP Proposed Water Management Approach

Hi Lisa,

I understand that you have concerns about the way water was managed at the Wainwright Water Treatment Plant expansion area excavation. I would like to explain the circumstances and rationale behind the decisions made, as well as our proposed path forward.

We broke ground on August 2nd and dealt with the top two vertical feet of gravel fill. This material was almost entirely clean save for the two hotspots identified in the May limited site characterization (which were containerized). However, things changed rather substantially once we started digging deeper. Native soil was encountered at a shallower depth than was anticipated in the civil plans. The target depth of the excavation was set at 5 vertical feet to allow for thermosiphons to be embedded at the level of permafrost. Native soil was encountered as shallow as 2 to 3 vertical feet, with frozen silt encountered at about 4 feet below ground surface (bgs). On August 4th, an area of substantial staining and strong petroleum odor was discovered in the native soil about 30 feet southeast of the existing building. Over the next couple days, we chased and contained this contaminated material down to the target depth over an area spanning about 2,000 square feet. During the first week of excavation we enjoyed relatively warm weather with light rain during the night. On August 6th, we began to notice puddles forming in the excavation as large ice lenses melted off and precipitation percolated through the gravel surface down to the silt layer. Unfortunately, this date coincided with several staff and patrons at the Olgoonik Hotel testing positive for COVID-19. Olgoonik made the decision to have all personnel tested and pause the job pending receipt of the results. All project personnel self-isolated while the tests were processed in Utqiagvik. Several people on the project team tested positive, which ended up resulting in at least one hospitalization. Following a two and a half day delay, enough personnel tested negative to resume work. Upon returning to the excavation we observed that several hundred gallons of water had accumulated from moderate precipitation and a substantial amount of thaw in the ice-rich permafrost.

Olgoonik raised concerns about the rate of thaw, as maintaining the integrity of the permafrost at the design depth was crucial to achieving the project goals. The excavation plan was altered such that the footprint would be advanced to the target depth in portions and immediately backfilled so as to prevent rapid thaw in other locations. To achieve this within the already excavated portion of the footprint, the decision was made to pump the standing water into containment, sample the soil, deploy a liner, and backfill all in the same day. A temporary holding pond was constructed onsite and lined with visqueen. The water in the excavation was pumped into this pond. A 1,000-gallon collapsible holding tank and a 35-gallon GAC polydrum filter was then brought to the site.

The water was pumped from the holding pond through the GAC and into the collapsible tank. We targeted 5 minutes of contact between the influent water and the GAC, necessitating a flowrate of <7 gallons per minute (gpm). Olgoonik personnel were advised to keep the flowrate between 2 and 5 gpm as a factor of safety. The degree to which this was achieved was variable, but flowrates remained below 7 gpm. Using leftover water sampling supplies still in Wainwright from the May

limited site characterization, we collected a treated water sample and field-duplicate sample from the effluent of the GAC polydrum. These samples were submitted for the same analyses (GRO, DRO, RRO, PAHs, and VOCs) as the rest of the project samples on a rush turnaround.

Much of the remaining footprint was excavated, sampled, and backfilled without the need for any water removal. However, during the final two days of the excavation, Wainwright received substantial sleet/rainfall. Surface runoff was observed flowing into the excavation as we finished digging the northeast quadrant. This water was largely managed within the excavation, but as backfilling commenced and the water was consolidated into a smaller area, it became apparent that we could not backfill further without saturating the clean gravel with potentially contaminated water. A second 1,000-gallon collapsible tank was brought to the site and GAC treatment resumed.

As of this date, roughly 1,800 gallons of potentially contaminated water remains in the onsite collapsible tanks. If the results of the treated water samples imply that contamination is still present above DEC cleanup levels, we will advise Olgoonik personnel to recirculate the water through the GAC filter. A new confirmation sample will be collected and submitted for analysis.

Upon receipt of the treated-water sample results, we will compare those results to the total aromatic hydrocarbon (TAH) and total aqueous hydrocarbon (TAqH) limits listed in Table 4 of the DEC *Excavation Dewatering General Permit*. If the results of the confirmation sample indicate that the treated water meets discharge criteria, and DEC concurs, we propose discharging the water in one of two locations. The preferred and most expedient option would be to discharge to land (the drainage channel bordering the south side of the project site) following best management practices (BMPs) to minimize erosion and sedimentation at the discharge point. It is expected the drainage channel is capable of infiltration at the maximum expected discharge rate. A written visual inspection record for erosion, sheen, and daily flow rate will be kept as part of the project record. A pump would need to be utilized to drain the tanks slowly as to not send a large pulse of water through the channel.

Alternatively, the water could be hauled to the old sewage lagoon located to the northeast of town on the road to the landfill. This will require coordination and approval from the city of Wainwright, but will not require additional BMPs at the discharge point.

If you have objections to the proposed discharge locations or require additional sampling, we will be happy to work with you on an approach that alleviates DEC's concerns and satisfies discharge criteria.

Regards,
Adam Wyborny



Adam Wyborny, PE | Environmental Engineer

2355 Hill Road

Fairbanks, Alaska 99709

www.shannonwilson.com

Appendix D

Waste Disposal Approvals

CONTENTS

- NSB Oxbow Landfill Approved Disposal Request Form.
- Supersacked Soil DEC Contaminated Media Transport and Disposal Approval Form
- DEC Solid Waste Division Approval for Disposal of Polluted Soil in the Wainwright Class III Landfill.
- Stockpiled Soil DEC Contaminated Media Transport and Disposal Approval Form

NSB OXBOW LANDFILL TRANSPORT AND DISPOSAL DOCUMENTATION

Oxbow Landfill Approved Disposal Request Form

DEC Contaminated Media Transport and Disposal Approval Form

SA-10 / NSB OXBOW LANDFILL – DISPOSAL REQUEST

Date: 27 Aug 2021 (NOTE: Project must be in progress **30 days** from date email approval sent to customer or a new disposal request/testing will be required)

Company/Contractor: Olgoonik Construction Services AFE or PO # 251221

Name: John Ford, Project Manager

Approver Name Code (if applicable): _____

Phone #: 907-242-4281 Email Address: jford@olgoonik.com

Material / Product Information

Name / Type: diesel contaminated soil from Wainwright water treatment plant remedial action

MSDS / CAS Number: _____

MSDS Attached (circle one): YES NO

Analytical Data Attached (circle one): YES NO

Hazardous Material (circle one): YES NO

*ASH Burn Permit Number: _____

Estimated Cubic Yards: 815

(Note: Cubic Yards are only billed for actual material offloaded at Landfill)

Packaging: bags (supersacks) (bag, drum, barrels)

Manufacturer: _____

Intended Use: _____ Comment: _____

Product Condition (new or used): _____

***** ATTACH ANY TESTING DATA OR LAB ANALYSIS DOCUMENTATION *****

Approved: Disapproved: _____

Signature: Eric Lervig / Dustin Hare Date: 9-2-21

SDS Attached (circle one): YES NO

TCLP Attached (circle one): YES NO

Date emailed to Customer: 9-2-21

SUBMIT REQUEST TO:

Eric Lervig / Dustin Hare

Email: landfill@iceservices.net

Office Phone: 907- 670-1014

Cell: 907- 448-3163

*** COPY OF APPROVED DISPOSAL REQUEST
MUST BE SUBMITTED BY DRIVER***

Landfill Hours of Operation:

8:00 am – 4:30 pm:
Monday through Saturday

8:00 am – 3:00 pm:
Sunday



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

Contaminated Media Transport and Treatment or Disposal Approval Form

DEC HAZARD/SPILL ID #		NAME OF CONTAMINATED SITE OR SPILL	
ADEC file 360.38.006		Wainwright Water Treatment Plant	
CONTAMINATED SITE OR SPILL LOCATION - ADDRESS OR OTHER APPROPRIATE DESCRIPTION			
Airport Road, Wainwright Alaska			
CURRENT PHYSICAL LOCATION OF MEDIA		SOURCE OF THE CONTAMINATION (DAY TANK, WASH BAY, FIRE TRAINING PIT, LUST, ETC.)	
Airport Road, Wainwright Alaska		unknown	
CONTAMINANTS OF CONCERN		ESTIMATED VOLUME	DATE(S) GENERATED
DRO, GRO		815 yd3	Aug 02 thru Aug 15, 2021
POST TREATMENT ANALYSIS REQUIRED (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)			
DRO, GRO			
COMMENTS OR OTHER IMPORTANT INFORMATION			
supersacks awaiting barge transport to Prudhoe Bay for disposal at Oxbow Landfill. Stockpile characterization results indicates GRO exceedances ranging from 274-340 ppm GRO and 480-5,480 ppm DRO. (JF, ADEC)			

TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA	PHYSICAL ADDRESS/PHONE NUMBER
Oxbow Landfill	SA10, Prudhoe Bay / 907-670-1014
RESPONSIBLE PARTY	ADDRESS/PHONE NUMBER
North Slope Borough Public Works - Melissa Bynum	1274 Agvik St, Utquigvik, AK 99723 / 907-852-2611
WASTE MANAGEMENT CO. / ORGANIZER	ADDRESS/PHONE NUMBER

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

John Ford

Name of the Person Requesting Approval (printed)

Signature

Digitally signed by John Ford
DN: cn=John Ford, o=Olgoonik, ou,
email=jford@olgoonik.com, c=US
Date: 2021.09.01 16:53:28 -0800'

Project Manager / Olgoonik Construction Services

Title/Association

01 Sept 2021

Date

907-242-4281

Phone Number

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

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

Julie Fix for Lisa Krebs-Barsis

DEC Project Manager Name (printed)

Signature

DocuSigned by:
C13B384FF3D0465...

EPS III

Project Manager Title

9/2/2021

Date

907 465 5368

Phone Number

NSB WAINWRIGHT CLASS III LANDFILL TRANSPORT AND DISPOSAL DOCUMENTATION

DEC Solid Waste Division Approval for Disposal of Polluted Soil in the Wainwright Class III Landfill

DEC Contaminated Media Transport and Disposal Approval Form



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Environmental Conservation

DIVISION OF ENVIRONMENTAL HEALTH
Solid Waste & Pesticides Program

610 University Avenue
Fairbanks, Alaska 99709-3643
Main: 907.451.2108
Fax: 907.451.2188
www.dec.alaska.gov

September 23, 2021

Sent via electronic mail

Melissa Bynum
North Slope Borough
P.O. Box 1050
Barrow, AK 99723

Re: Proposal to Dispose of Polluted Soil in Wainwright

Dear Ms. Bynum,

The Alaska Department of Environmental Conservation (ADEC) has completed its review of your application, dated September 20, 2021, to dispose of petroleum polluted soil in the Wainwright landfill. After reviewing the submitted proposal and the required analytical data that was included, ADEC approves this request to dispose 100 cubic yards of polluted soil in the Wainwright landfill.

The North Slope Publics Works Director and the Wainwright Village Supervisor have provided written approval for the disposal of the soil generated during the clean-up of the North Slope Borough water treatment plant. The soil also meets the criteria of AAC 60.025 and so this soil may be utilized as cover material, in berms, or any other beneficial use within the landfill. The use of the soil within the landfill is at the discretion of the Village Supervisor and no additional approvals are required from the ADEC Solid Waste Program.

I look forward to visiting Wainwright and inspecting the landfill next year. If you have any questions, or require any additional information, please contact me at 451-2174 or at trisha.bower@alaska.gov.

Sincerely,

A handwritten signature in blue ink that reads "Trisha Bower".

Trisha Bower
Environmental Program Specialist



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

Contaminated Media Transport and Treatment or Disposal Approval Form

DEC HAZARD/SPILL ID #	NAME OF CONTAMINATED SITE OR SPILL		
2643 / 360.38.006	NSB Wainwright Washeteria/Water Plant		
CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION			
Corner of Main Street & Airport Road, Wainwright, AK 99782			
CURRENT PHYSICAL LOCATION OF MEDIA		SOURCE OF THE CONTAMINATION (DAY TANK, WASH BAY, FIRE TRAINING PIT, LUST, ETC.)	
Old Airport Gravel Pad		Former Fuel Tanks	
CONTAMINANTS OF CONCERN	ESTIMATED VOLUME	DATE(S) GENERATED	
Diesel Fuel	100 cubic yards	8/12/21 - 8/14/21	
POST TREATMENT ANALYSIS REQUIRED (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)			
N/A			
COMMENTS OR OTHER IMPORTANT INFORMATION			
Soil meets the criteria of 18 AAC 60.025 and may be used as daily cover material or other beneficial uses within the landfill.			

TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA	PHYSICAL ADDRESS/PHONE NUMBER
Wainwright Class III Landfill	Latitude: 70.664844 Longitude: -159.967163
RESPONSIBLE PARTY	ADDRESS/PHONE NUMBER
Melissa Bynum	PO Box 1050 Utqiagvik, AK / (907)852-0489
WASTE MANAGEMENT CO. / ORGANIZER	ADDRESS/PHONE NUMBER
Scott Danner	5000 Boxer St. Utqiagvik, Alaska, 99723 / (907) 852-0489

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

Melissa Bynum, CDT

Name of the Person Requesting Approval (printed)

North Slope Borough Department of CIPM

Title/Association

Melissa Bynum Digitally signed by Melissa Bynum
Date: 2021.09.24 11:32:13 -08'00'

Signature

9.24.21

Date

(907)852-0489

Phone Number

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

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

Lisa Krebs Basis

DEC Project Manager Name (printed)

EPS IV

Project Manager Title

[Signature]

Signature

10/1/21

Date

769-7691

Phone Number

Important Information

About Your Environmental Report

IMPORTANT INFORMATION

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent

such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland