FIRE TRAINING PIT SITE CHARACTERIZATION REPORT
FAIRBANKS INTERNATIONAL AIRPORT

SLR Ref: 105.01288.18002

ADEC File Number: 100.38.070

December 2018

Fire Training Pit Site Characterization Report Fairbanks International Airport

Prepared for:

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CONTENTS

CONTENTS (CONTINUED)

ACRONYMS

1,2,4-TMB	1,2,4-trimethylbenzene
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADS	Alaska Development Services, Inc.
AFFF	aqueous film forming foam
ASTM	American Society for Testing and Materials
DOT&PF	Alaska Department of Transportation and Public Facilities
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CFR	crash fire rescue facility
COC	chain of custody
COPC	contaminant of potential concern
cyd	cubic yards
DRO	diesel range organics
FAA	Federal Aviation Administration
FAI	Fairbanks International Airport
FTP	Fire Training Pit
ft	feet
gal	gallons
GPS	global positioning system
GRO	gasoline range organics
LOD	limit of detection
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mL	milliliter
PAH	polynuclear aromatic hydrocarbon
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexane sulfonic acid
PFHpA	perfluoroheptanoic acid

ACRONYMS (CONTINUED)

PFNA	perfluorononanoic acid
PID	photoionization detector
PVC	polyvinyl chloride
QA	quality assurance
QAR	quality assurance review
QC	quality control
RCRA	Resource Conservation and Recovery Act
RRO	residual range organics
SLR	SLR International Corporation
TCLP	toxicity characteristics leaching procedure
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1. SUMMARY

This report presents the findings from SLR International Corporation's (SLR) site characterization of the Fairbanks International Airport (FAI) Fire Training Pit (FTP) completed in June of 2018. This work was conducted on behalf of the Alaska Department of Transportation and Public Facilities (DOT&PF), FAI to assess current conditions at the FTP and estimate the volumes of environmental media (i.e., FTP berm soil, and fill and ponded water within the pit) exceeding applicable Alaska Department of Environmental Conservation (ADEC) cleanup levels in support of future remediation.

The FTP may serve as a source area for soil and groundwater contamination resulting from firefighting training activities and use of aqueous film forming foam (AFFF) containing per- and polyfluoroalkyl substances (PFAS). The primary contaminants of potential concern (COPCs) identified at the site during the investigation included PFAS congeners perfluorooctanoic acid (PFOS) and perfluorooctane sulfonate (PFOA) in soils outside the pit liner and PFOA in site groundwater.

Analytical sample results for site waste and site characterization samples indicate the presence of soil, groundwater, and ponded water impacted by multiple COPCs; however, no evidence of compromised liner integrity was identified. Exceedance concentrations of PFOA and/or PFOS were detected in all but one soil samples and in one of four groundwater samples collected outside of the pit. Additionally, waste characterization samples from pit fill soil and ponded water above the liner contained elevated concentrations of PFOA, PFOS, diesel range organics (DRO), naphthalene, and 1,2,4-trimethylbenzene (1,2,4-TMB). The investigation findings suggest transport of PFOA and PFOS in AFFF overspray and sediment transport from the pit to surrounding soils rather than by leakage from the liner.

Volumes of impacted environmental media were calculated to facilitate future remediation of materials within the FTP. It is estimated that PFOA and PFOS-impacted media potentially requiring removal or remediation include up to 6,660 cubic yards (cyd) of pit fill, 9,110 cyd of outer berm soil and 260,000 gallons (gal) of ponded pit and soil dewatering water.

Recommendations based on the above site and waste characterization findings include:

- Further delineating the extent of the extent of soil and groundwater cleanup level exceedances beyond the FTP area;
- Limiting tracking and transport of PFOA and PFOS-impacted soils outside of the pit and outer berm area; and
- Mitigation of impacted wastes within the pit to minimize the potential for the material to act as a source area.

2. INTRODUCTION

This report presents the findings from SLR International Corporation's (SLR) site characterization of the FAI FTP (Figure 1) completed in June of 2018. This work was conducted on behalf of the DOT&PF to assess current conditions at the FTP and estimate the volumes of environmental media (i.e., FTP berm soil, and fill and ponded water within the pit) exceeding applicable ADEC cleanup levels in support of future remediation. The site characterization was conducted consistent with the ADEC-approved *Fire Training Pit Site Characterization Work Plan* (Work Plan; SLR, 2018a).

This report describes site characterization field activities; soil and water analytical results; and estimated volumes of environmental media exceeding applicable ADEC cleanup levels.

2.1 PROJECT BACKGROUND

The FTP is located approximately 740 feet (ft) southwest runway 2R/20L and the old crash fire rescue facility (CFR; Figure 2). The CFR consisted unlined fire training pits and a nearby burning aircraft propeller simulator. A large release of diesel fuel in 1990 resulted in listing the CFR (now the FTP site) as an ADEC Contaminated site (ADEC File Number 100.38.070).

Historical site activities are summarized as follows:

- **1989**: A site assessment conducted by Shannon and Wilson identified soil and groundwater impacts in the vicinity of the CFR with elevated concentrations of petroleum hydrocarbons, metals, and volatile organic compounds (VOCs) including 1,2-dichloroethane in soil and groundwater (DOT&PF, 1993).

- **1990**: Approximately 5,000 to 6,000 gallons was released from a fuel tanker used to store diesel fuel for fire training activities at the CFR. Additional releases from stored drums and above ground fuel tanks at the site may also have occurred. Impacted soil was excavated and landfarmed for treatment by bioremediation (DOT&PF, 1993).

- **1990**: Approximately 87 drums of hazardous materials were removed from a buried dump site located between the CFR and the "ski strip extension" (ADEC, 2018). It is unknown if all drums and debris were removed from the dump, and the exact contents and location of the drums was not well documented.

- **1993**: Construction of the current FTP was completed [Alaska Development Services, Inc. (ADS), 1993].

- **2007-2008:** The FTP liner was determined to be intact based on benzene, toluene, ethylbenzene and xylenes (BTEX); DRO; and surfactant analytical results from samples collected in wells installed on the periphery of the FTP site (ADEC, 2018).

- **2017:** PFOA and PFOS were detected at 0.26 micrograms per liter (µg/L) and 1.3 µg/L, respectively, in the Landfarm Pond located north of the FTP (Figure 2) during a preliminary AFFF investigation at multiple locations on the airport property (SLR, 2017).

- **2017:** DOT&PF collected a sample from the ponded water within the FTP for preliminary screening of potential contaminants. The sample results indicated elevated concentrations of multiple PFAS including PFOS at 1.1 milligrams per liter (mg/L) and PFOA at 0.140 mg/L (ARS Aleut Analytical, 2017). Additional PFAS were detected including perfluorohexane sulfonic acid (PFHxS), perfluorononanoic acid (PFNA), perfluorobutanesulfonic acid (PFBS), and perfluoroheptanoic acid (PFHpA).

Historical site activities have consisted primarily of investigations and remediation at the CFR. To date, no full-scale investigations of the FTP have been completed.

2.2 REGIONAL SETTING AND SITE LITHOLOGY

The FTP is located at the southwest end of the FAI property on an inside bend of a slough created by a former channel of the Tanana River. The main river channel is currently approximately 2,200 ft southeast of the FTP beyond a large man-made lake and the Tanana River Levee (Figure 2). The FTP site is relatively flat and consists of exposed dirt surrounded by low grass and few shrubs with little to no protection from wind.

Site lithology consists primarily of alluvial sediments (silt, sandy silt, and sand; or sandy silt and silty sand) with a shallow groundwater table, which is subject to seasonal variation influenced by the stage of the Tanana and Chena rivers. Field measurements collected during site characterization activities indicate that the depth to groundwater in the vicinity of the FTP ranges from 3 to 7 ft below ground surface (bgs). Historical gauging indicates a northwest flow at a gradient of 0.0025 ft/ft (DOT&PF, 1993). Groundwater recharge in the Fairbanks area is relatively low with annual precipitation averaging approximately 11 inches per year (NOAA, 2018).

2.3 FTP CONSTRUCTION

Current knowledge of the FTP construction and dimensions is based on as-built plan-view and cross-section drawings (Figures 3 and 4; ADS, 1993), and visual inspection of the FTP conducted during this project, as discussed in Section 5.1. The FTP was constructed between 1992 and 1993 and was completed as an US Environmental Protection Agency (USEPA) approved fire training area. The pit was constructed with a 50 ft wide by 4.5 ft tall berm (Figure 3) covering a footprint of approximately 322 ft by 322 ft (Figure 4). The area inside of the berm is approximately 203 ft by 203 ft. Diesel fuel used to ignite training fires was piped to a concrete burn pad located in the center of the pit from an aboveground storage tank outside the pit as shown in Figure 3.

The FTP was constructed partially below-grade with the center of the FTP excavated to approximately 5 ft bgs. The entire excavation was then lined with geotextile fabric liner placed above the static groundwater table (Figure 3). The fabric is overlain by approximately 2 ft of base fill material and contains a membrane (liner) monitoring system comprised of perforated

piping. An impermeable plastic liner was installed above the base fill and is covered by geotextile fabric, coarse plastic mesh, and approximately 2 ft to 3 ft of coarse pit fill material. The liner extends several feet horizontally beyond the crown of the pit berm (Figures 3 and 4).

2.4 OBJECTIVES AND SCOPE OF WORK

The project objectives were to collect data of sufficient quality and quantity to characterize the nature and extent of potential contaminants at the FTP and also to estimate the volume of impacted FTP-associated soil and ponded water exceeding ADEC cleanup levels. The following scope of work was implemented to meet the project objectives:

1. Characterization of wastes and determination of volumes for the following impacted materials:
    - **Ponded water**: Accumulated rainwater and water from fire-fighting activities accumulated within the pit;
    - **Pit Fill:** Gravel fill material above the liner and within the berms, including material saturated by ponded water;
    - **Outer Berm Material:** Gravel fill material outside the pit liner.
2. Delineation of impacts to soil and groundwater beneath and surrounding the FTP structure and comparison with applicable ADEC cleanup levels.

2.5 CONTAMINANTS OF POTENTIAL CONCERN

Soil, groundwater, and ponded water results for FTP COPCs are evaluated against applicable ADEC cleanup levels to determine impacts to fill material, native soil, groundwater, and ponded water. The list of potential FTP COPCs is based on historical firefighting training activities and potential contaminants resulting from the use of AFFF, diesel fuel, unknown materials used as firefighting props, and historical contamination from prior fuel releases and buried wastes within the area. The FTP COPCs are consistent with sampling requirements for fire training facilities and sites with unknown contaminants as specified in ADEC's *Field Sampling Guidance*, *Appendix F*, *Determination of Sampling and Lab Analysis for Petroleum in Soil and Groundwater, and Recommended Sampling Materials* (ADEC, 2017a). COPCs for soil, groundwater, and ponded water include:

- **Petroleum hydrocarbons**: Gasoline range organics (GRO), DRO, and residual range organics (RRO);
- **PFAS:** PFOS, PFOA, PFHxS, PFNA, PFBS, and PFHpA;
- **Resource Conservation and Recovery Act (RCRA) metals:** arsenic, barium, cadmium, chromium (III), lead, mercury, selenium, and silver;
- **VOCs**: full VOC list including BTEX and other VOCs listed in Table B1; and,

- **Polycyclic aromatic hydrocarbons (PAHs)**: acenaphthene, acenaphthylene, anthracene, benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[g,h,i]pyrene, chrysene, dibenz[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-c,d]pyrene, naphthalene, phenanthrene, and pyrene;

3. REGULATORY CRITERIA

Soil and groundwater COPC concentrations were compared against relevant ADEC cleanup levels contained in Title 18 of the Alaska Administrative Code (AAC), Chapter 75 (18 AAC 75) *Oil and Other Hazardous Substances Pollution Control*, as amended through November 7, 2017 (ADEC, 2017b). Concentrations of COPCs in ponded water were compared against groundwater criteria for the purpose of waste classification and determination of treatment and/or final disposition. Soil and groundwater criteria are summarized below.

3.1 SOIL CRITERIA

Soil results for COPCs except PFAS congeners PFHxS, PFNA, PFBS, and PFHpA were evaluated against cleanup levels contained in 18 AAC 75.341. Soil cleanup levels that apply to the site include Method Two, Tables B1 and B2. Fairbanks is located in the Under 40 Inch Zone, for which the most stringent of the human health or migration to groundwater pathway cleanup levels apply. No soil cleanup levels currently exist for PFHxS, PFNA, PFBS, and PFHpA. The applicable Method Two soil cleanup levels for the site are as follows:

- GRO, 300 milligrams per kilogram (mg/kg).
- DRO, 250 mg/kg.
- RRO, 11,000 mg/kg.
- VOCs: Full list including:
  - Benzene: 0.022 mg/kg;
  - Toluene: 6.7 mg/kg;
  - Ethylbenzene: 0.13 mg/kg;
  - Total xylenes: 1.5 mg/kg; and
  - 61 remaining VOCS: Varies, refer to 18 AAC 75.341 Table B1.
- PFAS:
  - PFOA: 0.0017 mg/kg; and
  - PFOS: 0.0030 mg/kg.
- RCRA Metals:
  - Arsenic: 0.20 mg/kg;
  - Barium: 2,100 mg/kg;
  - Cadmium: 9.1 mg/kg;
  - Chromium (III): 100,000 mg/kg;
  - Lead: 400 mg/kg;
  - Mercury: 0.36 mg/kg;
  - Selenium: 6.9 mg/kg; and
  - Silver: 11 mg/kg.
- PAHs: varies, refer to 18 AAC 75.341 Table B1.

3.2 GROUNDWATER CRITERIA

Groundwater concentrations for COPS except PFAS congeners PFHxS, PFNA, PFBS, and PFHpA were evaluated against ADEC groundwater cleanup levels for contaminated sites specified in 18 AAC 75.345. No groundwater cleanup levels currently exist for PFHxS, PFNA, PFBS, and PFHpA. The applicable groundwater cleanup levels for the site are as follows:

- GRO: 2.2 mg/L.
- DRO: 1.5 mg/L.
- RRO: 1.1 mg/L.
- VOCs: Full list including:
  - Benzene, 0.0046 mg/L;
  - Toluene, 1.1 mg/L;
  - Ethylbenzene, 0.015 mg/L;
  - Total xylenes, 0.19 mg/L;
  - Naphthalene, 0.0017 mg/L;
  - 1,2,4-TMB: 0.015 mg/L; and
  - 59 remaining VOCs: Varies, refer to 18 AAC 75.345 Table C.
- PFAS
  - PFOA: 0.0004 mg/L; and
  - PFOS: 0.0004 mg/L.
- RCRA Metals:
  - Arsenic: 0.00052 mg/L;
  - Barium: 3.8 mg/L;
  - Cadmium: 0.0092 mg/L;
  - Chromium (III): 22.0 mg/L;
  - Lead: 0.015 mg/L;
  - Mercury: 0.00052 mg/L;
  - Selenium: 0.1 mg/L; and
  - Silver: 0.094 mg/L.
- PAHs: 17 congeners: Varies, refer to 18 AAC 75.345 Table C.

4. PROJECT METHODS

The following section describes field methods for activities conducted as part of the 2018 FTP site characterization. Field activities included sample collection from pit fill soil, subsurface soil, ponded water, and groundwater. Field methods used were consistent with ADEC's *Field Sampling Guidance* (ADEC, 2017a) and the *Fire Training Pit Site Characterization Work Plan* (SLR, 2018a). Field activities were conducted by Qualified Environmental Professionals as defined in 18 AAC 75.333. Documentation of field activities and methods is included as Appendix A *Survey Data*, Appendix B *Laboratory Data Quality Assurance Review*, Appendix C *Field Notebook,* Appendix D *Field Forms,* Appendix E *Photograph Log*, *and Appendix F Waste Volume Calculations.*

4.1 PROJECT PLANNING AND PERMITS

Fieldwork was conducted under the supervision of an SLR staff holding an FAI Secure Identification Display Area badge with escort privileges and in accordance with the *Fire Training Site Characterization Safety Plan and Compliance Document* (SLR, 2018b). Additionally, field activities were completed in accordance with Federal Aviation Administration (FAA) *Notice of Proposed Construction or Alteration - On Airport* permit number 2018-AAL-56-NRA.

4.2 FIELD SURVEY

Mapping-grade Trimble® Geo 7X survey global positioning system (GPS) equipment was used to survey the spatial coordinates of site features, sample locations, and dimensions of the FTP berm, stained soil, and ponded water. The GPS data was collected in the NAD 1983 horizontal datum using the GEOID12B geoid model. Post-processing was completed using Trimble Pathfinder® software. Horizontal coordinates were reported with an estimated accuracy of 0.16 ft to 0.49 ft for 98.7 percent of the data (Appendix A). Vertical data accuracy was not determined as part of the post-processing.

4.3 FIRE TRAINING PIT VISUAL INSPECTION

Prior to soil or water sampling, a visual inspection of the FTP was conducted to document the condition and size of the pit, the presence of associated infrastructure, and evidence of contaminant impacts (i.e., stained soil, sheen, or stressed vegetation). The liner monitoring port was also inspected and tested for recoverable water. The location of the monitoring port, perimeter of the FTP berm crown, locations of stained soil within the pit, and the extent of ponded water were surveyed using GPS equipment. Inspection notes were recorded in the *Field Notebook* (Appendix A).

4.4 SOIL SAMPLING

Soil samples were collected from pit fill and subsurface soil (Figures 3 and 4). All soil samples were screened for VOCs using the heated headspace method as described in the following

section and documented in the *Field Notebook (Appendix A)* and on *Boring Logs* or *Soil Sampling Forms (Appendix D)*, as appropriate.

4.4.1 HEATED HEADSPACE SOIL SCREENING

A photoionization detector (PID) was used to conduct field screening of all soil samples using the heated headspace method as described in ADEC's *Field Sampling Guidance*. Consistent with the method, a representative soil sample was placed in a re-sealable plastic bag and placed in a warm area for a sufficient time to raise the sample temperature to at least 40 degrees Fahrenheit. After warming, the sealed soil samples were agitated (shaken) for 15 to 20 seconds and the PID probe tip was inserted into the bag. The highest headspace VOC reading was recorded as the field screening value.

4.4.2 PIT FILL SOIL SAMPLING

Shallow pit fill samples were collected from three locations within the FTP to establish COPC concentrations in fill material above the liner on opposite sides of the pit (Figure 5). One sample was collected adjacent to the liner monitoring port to evaluate COPC concentrations above the mean pond water line and soil staining. The two additional samples were collected on each side of the pond to evaluate COPC concentrations in stained soil along the edge of the ponded water. All pit fill samples were collected using stainless steel hand tools from an approximate depth of 0.5 ft bgs.

4.4.3 SUBSURFACE SOIL SAMPLING

Subsurface soil samples were collected from 12 borings drilled using a tracked GeoProbe® 6712 DT drill rig with direct-push Macro-Core® MC5 Core tooling. The boring locations are shown on Figures 4 and 5. The borings drilled were divided into two categories as follows:

- Four crown borings, one on each side of the berm crown just outside of the pit membrane; each boring was completed as a temporary monitoring well as described in the next section. The crown borings were sampled for all site COPCs
- Eight perimeter borings, one on each of the four sides and corners of the pit berm. Perimeter borings were sampled for PFAS only with the exception of boring BH7, which was also sampled for DRO due to its location adjacent to buried diesel conveyance piping. The locations of all perimeter borings were moved inwards approximately 40 ft from their planned location on the berm crown based on field observations.

Two soil samples were collected from each boring including a "shallow" sample at approximately 1 ft bgs and a "deep" sample immediately above the groundwater table. New stainless steel spoons were used to collect samples directly from disposable clear PVC liners installed in decontaminated stainless Macro-Core® tooling.

Soil lithology was classified consistent with American Society for Testing and Materials (ASTM) D2488 Standard Practice for Description and Identification of Soil as general guidance. Borings were logged continuously from the surface to total depth. Berm crown borings, BH1 to BH4, were drilled to 10 to 11 ft bgs, respectively in order to be completed as temporary wells while

perimeter borings, BH5 to BH10, were drilled to a depth 10 ft bgs, and BH12 to 5 ft bgs to sample soil above the static water table.

4.5 WATER SAMPLING

Water samples were collected from the temporary well points installed in berm crown borings and from ponded water to evaluate COPC concentrations resulting from historical activities at the FTP. Water samples were collected using a peristaltic pump and new polyethylene tubing (non-Teflon®-lined) at each well location when sampling for PFAS. After the PFAS samples were collected, the polyethylene tubing was replaced with Teflon-lined tubing to sample for the remaining analytes. Groundwater sample collection, well development, and ponded water sampling were recorded in the *Field Notebook (Appendix C)* and on *Groundwater Sampling Forms (Appendix D)*.

4.5.1 GROUNDWATER WELL DEVELOPMENT AND SAMPLING

Groundwater was sampled from berm crown borings BH1 to BH4, completed as temporary monitoring wells MW-1 to MW-4 for the purpose of evaluating liner integrity and the potential of the FTP to act as a contaminant source area. Borings were completed as temporary wells by installing a 1-inch prepack polyvinyl chloride (PVC) well screen (BH2 and BH3) or SP-16 stainless screens (BH1 and BH4) following soil sampling. The wells were developed prior to sampling by pumping with a peristaltic pump until either turbidity decreased to 10 nephelometric turbidity units or stabilized after a minimum of three boring annulus volumes of water were removed.

Groundwater samples were collected using low-flow purge and sampling or purging of three well volumes, consistent with the project Work Plan and ADEC *Field Sampling Guidance*. Low-flow sampling was used for 1-inch PVC wells and three volume purge used for wells installed as SP-16 stainless groundwater sampling screens due to their narrow ½-inch inner diameter.

The temporary wells were decommissioned following sampling by pulling the SP-16 sampling screen or 1-inch pre-pack PVC screen and well casing and filling the open borehole with bentonite chips. The chips were hydrated in 6-inch lifts to create a competent seal.

4.5.2 PONDED WATER SAMPLING

One water sample (SW1) was collected from ponded water within the pit to confirm the previous pond water PFAS sample results and to test for the full suite of COPCs. The water sample was collected from the southwest edge of the ponded water, approximately 75 ft inwards from the southwest side of the pit berm (Figure 5). The water sample was collected using a peristaltic pump with tubing extending to 5 ft from the water's edge.

4.6 FIELD BLANK AND FIELD RINSATE SAMPLES

Field blank samples were collected to evaluate potential cross-contamination during the collection and handling of PFAS samples. The field blanks consisted of two laboratory-provided

bottles of PFAS-free water that were poured into a clean and empty, laboratory-provided 500 milliliter (mL) bottle. One field blank bottle was stored and transported in each cooler of PFAS samples. A minimum of 1 field blank was collected for every 20 soil and water PFAS samples.

Field equipment rinsate samples were collected to evaluate potential cross-contamination during the collection and handling PFAS soil samples. Equipment rinsate samples were collected by pouring laboratory-provided PFAS-free water over a new, disposable drill core liner and a stainless sampling spoon and collecting the rinsate into a 250 mL sample container.

4.7 SAMPLING EQUIPMENT DECONTAMINATION PROCEDURES

Industry-standard practices were followed to avoid cross-contamination of samples including us of disposable sampling equipment and decontamination of non-disposable equipment coming into contact with sample media. Disposable sampling equipment included polyethylene or Teflon-lined tubing used for groundwater sampling and disposable scoops or stainless spoons used for soil sample collection. Non-disposable sampling equipment was decontaminated off site prior to use and after use at each sampling location. Decontamination consisted of a two-part wash: first with Alconox® or equivalent detergent mixed with deionized water, followed by a rinse with deionized water. Water generated during decontamination of sampling equipment was disposed of as described in Section 5.8.

4.8 SAMPLE HANDLING AND CHAIN OF CUSTODY

Samples were collected directly into laboratory-supplied sample containers appropriate for the required analyses. The samples were labeled and placed into a chilled cooler immediately following collection. Sample and cooler temperatures were maintained at approximately zero to 6 degrees Celsius, throughout transport and shipment to the laboratory. Samples were handled and transported in a manner that maintained sample integrity and did not exceed specified holding times. Each sample was documented on a chain of custody (COC) form and in the field logbook. The COC form was sealed in the sample cooler and each cooler was sealed with a signed custody seal for shipment to the analytical laboratory.

4.9 INSTRUMENT CALIBRATION

Field instruments, including a YSI® 556 multi-parameter water quality meter and PID, were calibrated daily according to manufacturer specifications prior to use. No instrument drift was observed during sampling and screening activities. Instrument calibrations for the PID and YSI® 556 were recorded in the *Field Notebook (Appendix C)* and on *Water Parameter Meter Calibration Log* forms (Appendix D), respectively.

4.10 WASTE MANAGEMENT

Field generated wastes included soil cuttings, well purge water, and non-hazardous consumables. Soil cuttings and well purge water was deposited within the lined FTP area for collection during future remediation of the site. Non-hazardous consumables were bagged and disposed of at the Fairbanks North Star Borough landfill.

4.11 WORK PLAN DEVIATIONS

One deviation and three modifications to activities prescribed in the project Work Plan were made based on field conditions and sample classification. The single deviation consisted of:

- Duplicate samples were not collected for pit soil samples SS1, SS2, and SS3, and pit pond water sample SW1 which are classified as waste characterization samples.

Three modifications made to sampling locations included:

- Perimeter soil boring locations were moved towards the FTP berm crown by approximately 40 ft based on a lack of visible impacts to soils beyond the berm crown.

- Perimeter soil boring BH11 was moved approximately 60 ft towards the south berm crown corner to avoid potential buried water lines leading to a hydrant observed on the site (Figure 4);

- An additional pit fill sample (SS1) was collected to evaluate COPC concentrations in soils near the berm crown above stained soils present along the edge of ponded water.

5. ANALYTICAL METHODS AND DATA QUALITY

The following section describes project analytical methods and analytical data quality including sample handling; PFAS field and equipment rinse blanks; and the *Laboratory Data Quality Assurance Review* (QAR), laboratory checklist, and laboratory analytical reports included as Appendix B. All project samples were handled, analyzed, and evaluated for quality control (QC) in accordance with the project Work Plan.

5.1 ANALYTICAL METHODS

Soil and groundwater samples were submitted to analytical laboratories for testing of project COPCs. Analyses of the six PFAS congeners were conducted by ALS Environmental of Kelso, Washington, an ADEC-accredited laboratory, by USEPA Method 537M. USEPA Method 537M provides a reporting limit of 5 nanograms per liter, two orders of magnitude lower than the ADEC groundwater cleanup levels for PFOA and PFOS.

Analysis of the remaining analytes was conducted by SGS North America, Inc. of Anchorage, Alaska, an ADEC-accredited laboratory, by the following analytical methods:

- GRO: Alaska Method 101;
- DRO: Alaska Method 102;
- RRO: Alaska Method 103;
- VOCs (Full List): USEPA Method SW8260B;
- PAHs: USEPA Method SW8270D-with selective ion monitoring; and
- Toxicity characteristics leaching procedure (TCLP) Metals: USEPA Method SW1311/6020A (soil only); and
- Total metals: USEPA Method SW6020A (groundwater only).

5.2 PROJECT DATA QUALTIY AND INTEGRITY

Project data quality and integrity were maintained during field activities by adhering to the following procedures as described in the Work Plan:

- Documentation of all field activities in a bound project field logbook and on task-specific forms;
- Maintaining sample COC and integrity from sample collection through delivery to the analytical laboratories;
- Collection of field duplicate samples at a frequency of 10 percent of the total number of samples collected during the sampling event with a minimum of one duplicate collected from each media except for samples considered to be waste characterization samples;

- Analysis of trip blanks accompanying sample containers analyzed for volatile contaminants from the laboratory through sample collection and transport back to the analytical laboratory;
- Evaluation of analytical data quality assurance (QA)/ QC procedures as discussed in the laboratory QAR and ADEC Laboratory Data Review Checklist, as discussed in the following section;
- Analysis of field blanks and equipment rinsate blank samples collected for evaluation of PFAS cross-contamination during sample handling and collection; and,
- Avoidance of cross-contamination of samples by consumer materials containing PFAS such as Teflon, Gore-Tex® fabric, plumbers tape, flame-resistant clothing, lubricants, and sealants.

5.3 ANALYTICAL QUALITY ASSURANCE AND QUALITY CONTROL

QA procedures included the analysis of field duplicates and trip blanks, and completion of a laboratory data QAR by a SLR chemist. The QAR includes the completion of an ADEC Laboratory Data Review Checklist for each analytical report. QC procedures included adherence to appropriate sample collection methodology, preservation, and analytical methods as described in the Work Plan. Any discrepancies associated with the samples collected from the site are identified in the QAR and summarized below. The QAR and the completed ADEC Laboratory Data Review Checklist are presented in Appendix B.

The project data were deemed acceptable for use with minor issues noted in the QAR regarding laboratory method blanks; field blanks; laboratory detection limits; surrogate recovery results; matrix spike and matrix spike duplicate samples; and field duplicates. Qualified results are outlined below and presented in detail in SLR's QAR.

- **Laboratory Method Blanks:** Detections in laboratory method blanks resulted in flagging of data for mercury in soil, mercury in water, chromium in soil, PFNA, and PFHxS. A high bias was indicated and all affected results were below applicable cleanup levels, therefore data usability was not impacted.
- **Reporting Limits:** For select VOC analytes, typical laboratory technological methodology limitations resulted in limits of detection (LODs) which did not meet ADEC cleanup levels. All data was considered useable as qualified, and all results of not detected confirm the absence of target analyte to the level of the reported LOD.
- **Surrogate Recovery Results:** Surrogate recoveries associated with fluoranthrene-d10 and PFNA were outside of acceptance limits. Results were below LODs and applicable cleanup levels. Therefore, all data was usable as qualified.
- **Matrix Spike and Matrix Spike Duplicate Samples:** A high bias was indicated for PFOS in soil sample BH1-S. The detected result was over 30-fold above the applicable ADEC cleanup level, therefore the data was usable as qualified.
- **Field Duplicates:** The field duplicate relative percent difference was outside of acceptable limits for parent/duplicate samples MW2/MW29 (water; chromium and lead)

and BH2-D/BH99 (soil; PFOA). In both cases, laboratory precision was established within acceptable limits, thus the impact to data was considered minimal and all data was considered usable as qualified.

It should be noted that field blank sample FB2 had detections of PFHxS and PFOS at concentrations near the laboratory LOD) All associated samples had detectable results well over ten times that of the field blank detections, therefore all data was useable without qualification. No other issues were noted with PFAS field or rinse blanks.

6. FIRE TRAINING PIT INSPECTION

The visual inspection of the FTP conducted prior to characterization activities is described in the section below and documented in the *Field Notebook* (Appendix C) and Photograph Log (Appendix E). The observed site features are presented in plan view on Figure 5 and in cross-section on Figure 7.

6.1 PIT FEATURES

The FTP consists of a large, pit constructed of bermed soil with the following associated features relevant to waste and site characterization included:

- **Berm Crown**: The berm crown was identified based on historical diagrams and visual inspection of the berm profile. The square berm crown matched the as-built dimensions of approximately 203 by 203 ft, as confirmed by survey data. The crown and overall profile of the berm were difficult to identify in the field due to the relatively flat nature of the berm (Photographs 1 and 2). Field measurements and as-built drawings suggest that the berm is slightly taller and wider along the eastern extent towards borings BH3 and BH9 (Figure 4). Heavy machinery and automobile tracks within and across the dry extent of the berm suggest that the berm may have been compacted by vehicle traffic since its original construction and that soil from the berm and pit may be transported out of the FTP area. Additionally, berm soil was observed to be transported across the site by wind.

- **Pit Stained Soil**: A ring of dark, stained soil was observed, extending approximately 10 ft to 15 ft outwards from the edge of the ponded water within the FTP (Photographs 1, 2, and 4). Soil samples SS2 (Photograph 15) and SS3 were collected from the stained soil on opposite sides of the ponded water. Staining at the sample locations extended into the saturated layer. No staining was observed above perimeter of the stain ring or at soil sample SS1 collected near the liner monitoring point (Photograph 14).

- **Pit Ponded Water**: Dark colored water was present within the pit with diameter of approximately 115 ft and covering approximately 32 percent of the pit area inside the berm crown. Droplets of non-aqueous phase free product were observed along the pond edges and a strong hydrocarbon odor was present. The depth of water in the center of the pond was estimated to be 1.5 ft, decreasing outwards with the slope of the berm. The depth of water likely fluctuates with precipitation and evaporation as suggested by the extent of smeared soil above the water line (Photographs 1 and 2).

- **Pit Structures**: Structures observed within the FTP included two large steel pipes present near the center of the pit within the area of ponded water (Photographs 1 and 2). Additionally, the outlines of submerged concrete pads were observed; the pads are shown on the as-built layout on Figure 3.

- **Liner Monitoring System**: the liner monitoring port was located underneath a 12-inch steel cover set in a square concrete pad (Photographs 3 and 14). The liner monitoring

system consists of polyethylene tubing passing through a steel conduit. The conduit appears to continue from the monitoring port towards the center of the pit at a downward slope. The end point or attachment of the tubing below the ponded water is unknown. Liner monitoring system is discussed further in Section 5.2.

- **Liner Manhole Grate**: A 2 ft diameter metal sewer-type grate was observed at the edge of the ponded water and within the stained soil area (Photographs 4 and 15). The grate may correspond with a "sump" as shown on Figure 4. Water was visible beneath the grate at a depth corresponding to the surface of the pit ponded water.

- **Diesel Fuel Conveyance**: A 5000-gallon above ground, horizontal, double-walled steel tank with buried piping leading to a flow meter and valve to the north of the FTP pond. The routing of the piping appeared to be consistent with historical as-built diagrams (ADS, 1993), as indicated by vertical stand-pipes. Additionally, a private utility locate service traced the electrical lines to the tank pump, pump control panel, and emergency kill switch (Photographs 5 to 8).

- **Fire Hydrant**: A fire hydrant and buried piping shown on historical site figures were confirmed visually and by electrical tracing of the pipe. The hydrant is located in the south corner of the site (Figure 4) and is believed to be active.

- **Monitoring Well**: an unmarked monitoring well was found near boring BH7. The well appeared to be in good condition and was assigned the identification "MW-A," (Photograph 9). No other monitoring wells were observed within the project area as shown on Figure 4.

6.2 LINER MONITORING SYSTEM INSPECTION AND LINER INTEGRITY

The liner monitoring system port indicated on as-built drawings was found on the south edge of the FTP berm (Figure 4). A peristaltic pump was used to attempt to collect a water sample from the ¼ inch polyethylene tubing present in the port; however, only air could be pumped from the monitoring system. The air was screened for VOCs using a PID. A PID reading of 3.4 ppm from the monitoring system was similar to ambient air levels, suggesting either that hydrocarbon impacts from diesel fuel are not present beneath the liner or that the liner monitoring system is compromised, and only ambient air was being screened.

Field observations suggest that the FTP liner is not compromised because it retains rainwater, snowmelt, and water used during fire training exercises, at a static water level above the natural water table. Additionally, inspection of liner material collected from berm crown boring BH10 shows that the main, 1/4-inch thick plastic liner is not degraded near the berm crown. Protective geotextile fabric and plastic mesh layers were also present immediately above and below the liner.

7. SITE CHARACTERIZATION

Site characterization samples collected from soil and groundwater outside of the FTP indicate substantially lower COPC concentrations than in waste characterization samples collected from pit fill soil and ponded water. Cleanup level exceedances in site characterization soil and groundwater samples were limited to detections of PFOA and/or PFOS as described in the following sections. Concentrations of the remaining analytes including GRO, DRO, RRO, VOCs, RCRA metals, and PAHs were non-detect or below applicable cleanup levels; these analytes are not considered COPCs for site characterization. Site characterization sample results are summarized in Table 1 with analytical results presented in Tables 2 and 3. Soil and groundwater sample exceedances are shown on Figures 5 and 7, respectively with select sampling locations are shown in cross-section on Figure 6.

7.1 SUBSURFACE SOIL

The berm crown and outer fill material are impacted by PFAS congeners PFOA and/or PFOS at concentrations exceeding ADEC Method Two Migration to Groundwater soil cleanup levels of 0.0017 and 0.0030 mg/kg, respectively. No other analytes exceeded ADEC soil cleanup levels in samples collected from berm crown or perimeter borings. PFAS exceedances were reported in 11 of the 12 total borings completed as described below. Subsurface soil sample results for the berm crown borings and perimeter borings are presented in Tables 2A and 2B, respectively. Sample locations with exceedances and the known extent of cleanup level exceedances are shown on Figure 5.

Exceedances in the four berm crown borings included PFOA and/or PFOS in all borings except BH4. PFOA exceedance concentrations and included one shallow and one deep sample with concentrations of 0.0043 and 0.0021 mg/kg, respectively. PFOS exceedance concentrations were one to two orders of magnitude greater than for PFOS and included two shallow and one deep sample with concentrations of 0.013 and 0.15 mg/kg for shallow samples and 0.31 mg/kg for the deep sample. The results indicate that PFOS are more prevalent in the berm crown soil, but no correlation with sample depth is evident.

Perimeter boring exceedances included PFOA detections in three borings and PFOS in all eight borings. PFOA exceedances were detected shallow and deep samples of BH10 and only shallow samples in BH6 and BH12. Shallow exceedance concentrations ranged from 0.0052 to 0.02 mg/kg, one to two orders of magnitude less than for PFOS exceedances reported for seven shallow and six deep samples. The range of shallow and deep PFOS exceedance concentrations were 0.039 to 0.16 mg/kg and 0.0061 to 0.77 mg/kg, respectively. Concentrations of PFOS were greatest along the northwest to northeast sides of the berm perimeter as indicated by detections of 0.31, 0.56, and 0.77 mg/kg for BH7, BH8, and BH10, respectively.

No other COPCs were detected in berm crown borings BH1 to BH4 and DRO was not detected in perimeter boring BH7, the only perimeter boring sampled for DRO due to its proximity to the diesel conveyance piping (Figure 4).

7.2 GROUNDWATER

Water sample results indicate that fire-fighting foam use in the FTP has caused a groundwater a cleanup level exceedance along the northwest side of the pit. A single groundwater cleanup level exceedance for PFOA was detected in temporary well MW2 at a concentration of 0.00049 mg/L, slightly above the groundwater cleanup level of 0.0004 mg/L. The PFOA concentration in MW2 is two orders of magnitude lower than the 0.032 mg/L detected in ponded pit water, suggesting that pit water is not directly impacting groundwater. Groundwater results are presented in Table 3 and the location of the single exceedance is shown on Figure 6.

Additionally, the highest concentrations of PFAS congeners without cleanup levels were reported in MW1 and included 0.0039 mg/L for PFBS and 0.015 mg/L for PFHxS. PFOS concentrations for water samples were well below the cleanup level.

8. WASTE CHARACTERIZATION

Waste characterization activities included an evaluation of media within the lined pit area and impacted soil in the outer berm area for the purposes of future site remediation planning. Analytical samples collected strictly for waste characterization purposes were taken from grossly-contaminated fill soil and ponded water within the lined pit. Waste characterization sample results indicated concentrations of PFOA, PFOS, DRO, naphthalene, RRO, and/or 1,2,4-TMB exceeding ADEC cleanup levels in pit fill and ponded water. This section also includes an evaluation of the extent of impact in outer berm area as defined by cleanup level exceedances for PFOA and PFOS in berm crown and perimeter soil borings.

8.1 PIT FILL SOIL

Pit fill waste characterization soil sample results indicate that the fill material is impacted by firefighting training activities. Pit fill soil PFOS concentrations exceed ADEC Method Two Migration to Groundwater cleanup level in stained soil surrounding the ponded pit water. PFOS concentrations appear to decrease with distance from the stained soil outwards to the berm crown. For example, the concentration of PFOS in sample SS1 of 0.36 mg/kg is an order of magnitude less than concentrations of 2.8 mg/kg and 3.6 mg/kg for samples SS2 and SS3, respectively.

Additionally, exceedances of ADEC Method Two Migration to Groundwater cleanup levels for PFOA, DRO, and naphthalene, were detected in samples SS2 and SS3; these samples were collected from stained soil. Exceedances of DRO and naphthalene were detected only in sample SS2 which had the highest DRO concentration (5,530 mg/kg) and PID screening value (27.7 parts per million) of any project sample.

It is assumed that all pit fill soil is impacted and exceeds applicable soil cleanup levels; therefore, all soil within the FTP is included in the waste soil volume calculated in Section 7.4.

8.2 OUTER BERM SOIL

Soil sample results from berm crown and perimeter borings indicate a large area of soil outside of the lined pit exceeding ADEC Method Two Migration to Groundwater cleanup levels for PFOA and PFOS, as discussed in Section 6.1 and shown in Figure 5. The affected area is largely defined by PFOS concentrations up to two orders of magnitude greater than cleanup level. The volume of impacted soil is calculated as described in Section 7.4.

8.3 PONDED WATER

Ponded pit water sampled for waste characterization purposes was found to be impacted by firefighting training activities, containing PFOA, PFOS, DRO, RRO, 1,2,4-TMB, and naphthalene at concentrations exceeding ADEC groundwater cleanup levels. The pit water is most impacted by PFOS with a concentration of 1.6 mg/L, four orders of magnitude above the cleanup level of

0.0004 mg/L. The volume of ponded water and water contained within the pore space of saturated soils in the pit is calculated as described in the following section.

8.4 WASTE VOLUMES

Waste volumes were determined to aid in planning of future remedial actions. Calculated volumes are based on site measurements (Figures 5 and 7), available as-built drawings (Figures 3 and 4), and analytical results as described below. Wastes present in the FTP include non-hazardous ponded water and pit fill soil. As-built and field measured volume calculations are presented in worksheets included as Appendix F.

8.4.1 PIT FILL

The volume of pit fill material includes all material above and within the lined pit area (Figure 5). The volume of pit fill material is estimated to be 5,760 to 6,660 cyd for field-measured and as-built calculated volumes, respectively. The volume includes inner berm slope and pit floor material. Inner berm slope material volumes were calculated using the average of berm cross-sectional areas. The difference in as-built and field-measured volumes may be the result of site compaction over time since construction.

8.4.2 OUTER BERM SOIL

The volume of outer berm soil includes soil at the liner edge extending outwards to the outer perimeter borings and ranges from approximately 8,200 to 9,110 cyd for field-measured and as-built calculations, respectively. For as-built calculations, the outer berm was conservatively determined to include all fill soil extending outwards from the liner edge, as shown Figure 4. The outer berm soil area for field measurements is based on the impacted interval extending from buried liner edge, sloping downwards to the water table at the perimeter borings, as shown in Figure 7.

8.4.3 PONDED PIT WATER AND SOIL PORE WATER

The volume of ponded pit water and recoverable pore water within saturated soils was calculated to be approximately 190,600 and 170,000 gal, respectively, based on field measurements. The ponded water and recoverable pore water volumes were conservatively calculated from the cross-section area multiplied by the width of the ponded water, with the intent of providing a conservative value in the event of increased water levels due to seasonal precipitation.

The volume of recoverable porewater within the saturated pit soils was calculated based on the assumption that remediation dewatering of saturated pit soil will be required prior to disposal. The calculated volume assumes an average porosity of 0.33 for well-graded sand and 80 percent recoverable water content.

8.5 WASTE DISPOSITION

Waste disposal options for site remediation involving the removal of the FTP as potential PFAS source area are presented below. Based on the waste characterization results, the pit fill material and ponded water will be classified as non-hazardous under RCRA as listed in title 40 of the Code of Federal Regulations part 261 and adopted by reference in 18 AAC 62, *Hazardous Waste* (ADEC, 2003). Potential waste disposal options for identified wastes are described below.

Common remedial options for PFOA, PFOS, DRO, and naphthalene-impacted soils and pit fill may include but not be limited to:

- Permanent remediation through excavation and off-site disposal in a lower-48 states Class A landfill; soil with elevated PFAS concentrations will not likely to be accepted at the Fairbanks Municipal Landfill or approved for disposal at the facility by ADEC; or

- Temporary source area mitigation by stockpiling and/or covering impacted soils to prevent migration of PFAS.

Remedial options for ponded water and water removed to support excavation activities impacted by PFOA, PFOS, DRO, RRO, 1,2,4-TMB, and naphthalene may include:

- On-site treatment using granulated activated carbon and discharge to ground surface; or

- Off-site transport for treatment and disposal at an approved facility.

Additional remedial and waste disposition methods may be considered for a remedial site plan based on ADEC and/or landfill operator approval.

9. DISCUSSION AND RECOMMENDATIONS

The site FTP Site Characterization was completed to provide a basis for planning of remediation of the FTP and evaluation of impacts to surrounding soils and groundwater. The findings of the project indicate that historical activities at the FTP have resulted in the following impacts to soil and groundwater outside of the pit:

- No visible impacts from firefighting activities were noted in soils outside of the pit;
- COPCs in outer fill material are limited to PFOA and PFOS at concentrations exceeding Migration to Groundwater cleanup levels in 11 of 12 soil boring locations. The area of outer fill material exceeding cleanup levels is defined by PFOS at concentrations one to two orders of magnitude greater than for PFOA.
- A single groundwater cleanup level exceedance for PFOS along the northwest side of the FTP, suggesting that high COPC concentrations in ponded pit water have limited to no impact on groundwater.
- No evidence of compromised liner integrity was identified; PFAS detections outside of the FTP are potentially due to soil transport by wind and vehicles.

Investigation of waste media within the pit indicates impacts to pit soil and ponded water with concentrations above ADEC cleanup levels but below RCRA action levels for hazardous wastes. Findings included:

- Visibly-impacted, hydrocarbon-stained soil within the pit in a ring surrounding the ponded water;
- Pit fill exceeding applicable soil cleanup levels for PFOA and PFOS, with a volume conservatively estimated to be 6,660 cyd; and
- A large outer berm area of soil exceeding applicable soil cleanup levels for PFOA and PFOS, with an estimated volume of 9,110 cyd.

Recommendations based on the above site and waste characterization findings include:

- Delineation of the extent of soil and groundwater cleanup level exceedances outside of the pit, including identification and sampling of any existing groundwater monitoring wells;
- Limiting vehicle traffic in and out of the pit to reduce tracking of PFOA and PFOS-impacted soils outside of the pit and outer berm area; and
- Remediation or mitigation of impacted wastes within the pit to minimize the potential for the material to act as a source area.

10. REFERENCES

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LIMITATIONS

The services described in this work product were performed in accordance with generally accepted professional consulting principles and practices. No other representations or warranties, expressed or implied, are made. These services were performed consistent with our agreement with our client. This work product is intended solely for the use and information of our client unless otherwise noted. Any reliance on this work product by a third party is at such party's sole risk.

Opinions and recommendations contained in this work product are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. The data reported and the findings, observations, and conclusions expressed are limited by the scope of work. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this work product.

The purpose of an environmental assessment is to reasonably evaluate the potential for, or actual impact of, past practices on a given site area. In performing an environmental assessment, it is understood that a balance must be struck between a reasonable inquiry into the environmental issues and an appropriate level of analysis for each conceivable issue of potential concern. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

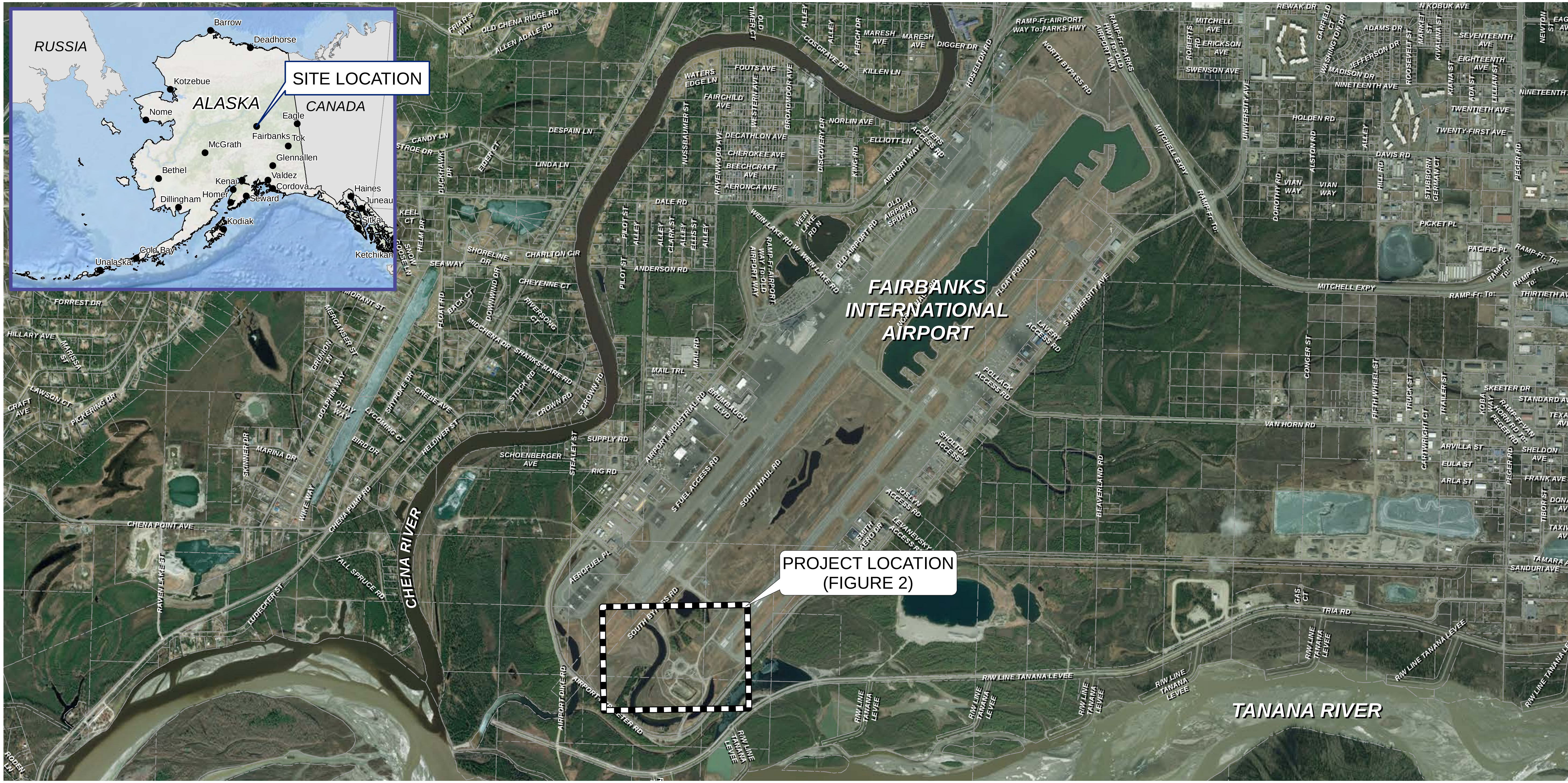
No investigation can be thorough enough to exclude the presence of hazardous materials at a given site. If hazardous conditions have not been identified during the assessment, such a finding should not therefore be construed as a guarantee of the absence of such materials on the site, but rather as the result of the services performed within the scope, practical limitations, and cost of the work performed.

Environmental conditions that are not apparent may exist at the site. Our professional opinions are based in part on interpretation of data from a limited number of discrete sampling locations and therefore may not be representative of the actual overall site environmental conditions.

The passage of time, manifestation of latent conditions, or occurrence of future events may require further study at the site, analysis of the data, and/or reevaluation of the findings, observations, and conclusions in the work product.

This work product presents professional opinions and findings of a scientific and technical nature. The work product shall not be construed to offer legal opinion or representations as to the requirements of, nor the compliance with, environmental laws rules, regulations, or policies of federal, state or local governmental agencies.

FIGURES



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Legend

Property Boundary

N

0 1,000 2,000 4,000 Feet

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY.
ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

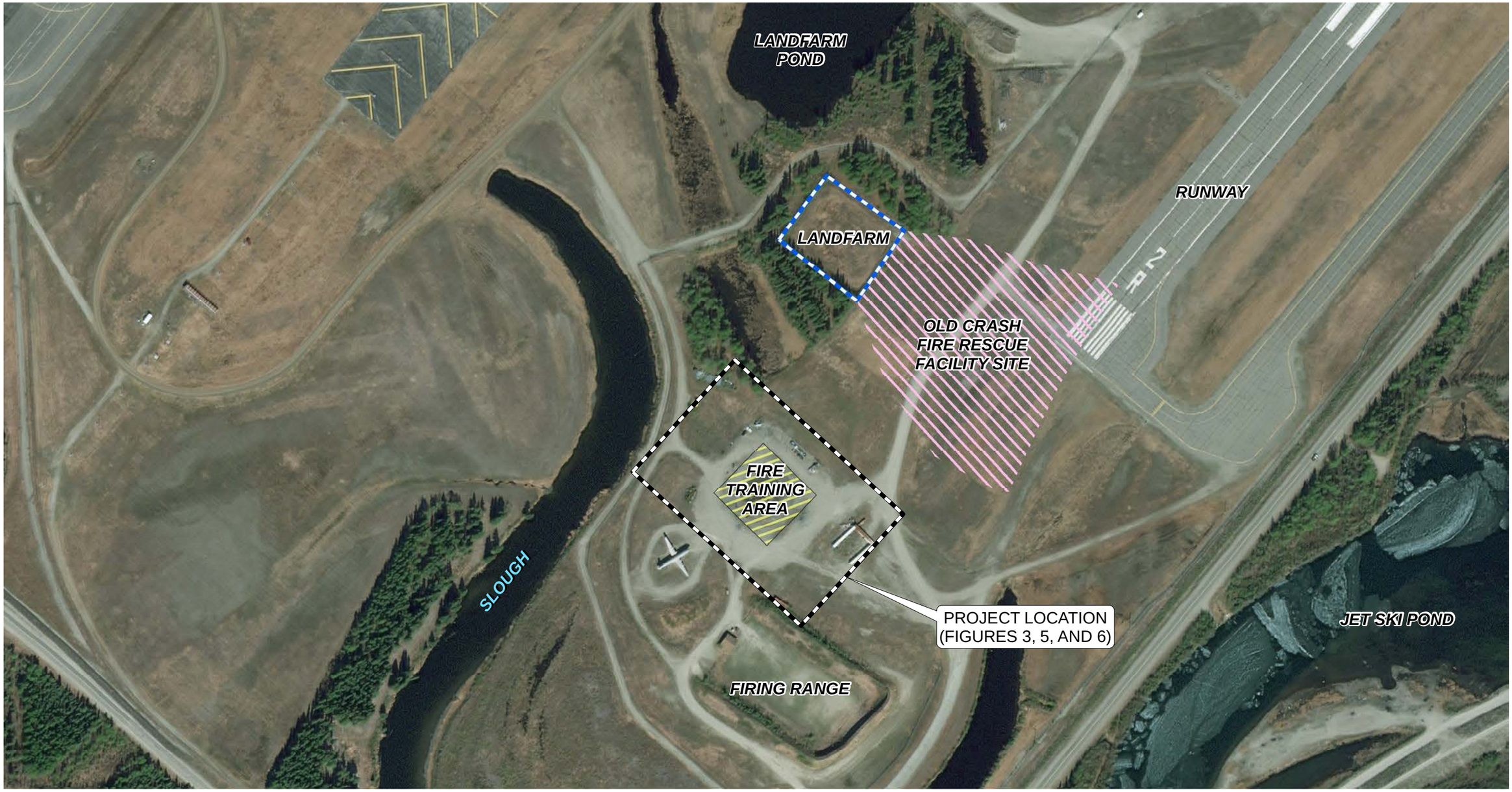
SLR

FIRE TRAINING AREA
FAIRBANKS INTERNATIONAL AIRPORT
FAIRBANKS, ALASKA

Report
2018 FIRE TRAINING PIT SITE CHARACTERIZATION

Drawing
SITE LOCATION

Drawing August 2018	Scale 1 in = 2,000 feet	Fig. No. 1
File Name F1 Site Location RPT_18.mxd	Project No. 105.00184.18002	



Legend

- Fire Training Area
- Landfarm
- Old Crash Fire Rescue Facility Site

N

0 125 250 500 Feet

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY.
ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SLR

FIRE TRAINING AREA
FAIRBANKS INTERNATIONAL AIRPORT
FAIRBANKS, ALASKA

Report
2018 FIRE TRAINING PIT SITE CHARACTERIZATION

Drawing
SITE FEATURES

Drawing	August 2018	Scale	1 in = 250 feet
File Name	F2 Site Features RPT_18.mxd	Project No.	105.00184.18002

Fig. No. 2

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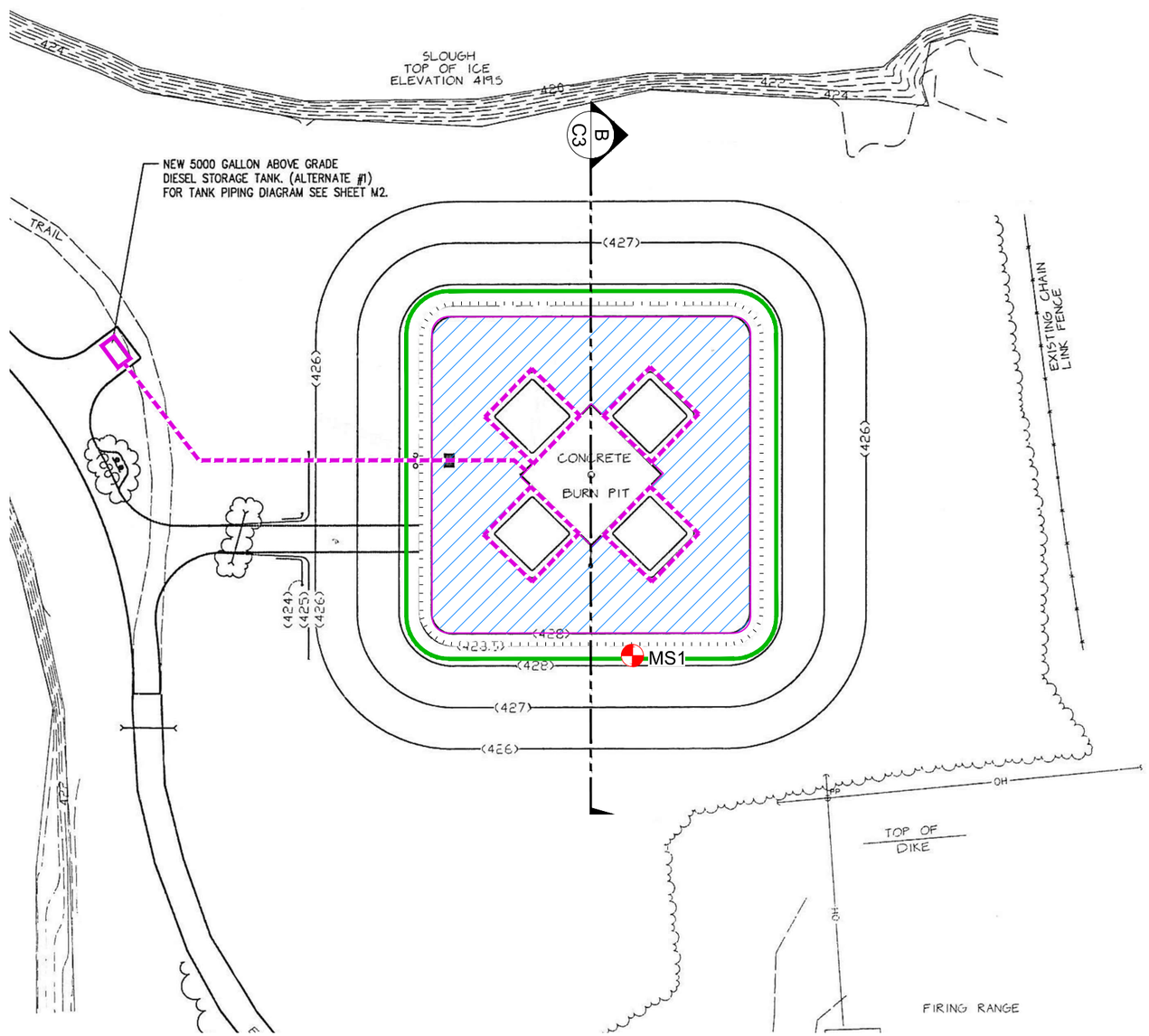


0 80' 160'

APPROXIMATE SCALE IN FEET

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES AND UTILITIES ARE SHOWN.

SOURCE NOTES

1. Fairbanks International Airport As-Built Construction Plans, EPA Approved Fire Training Area, Project #: 64848, Alaska Development Services, Inc., May 7, 1992 - June 8, 1993.

LEGEND

- (427) Elevation Contour (1 Ft Interval)
- (429.5) Crown of Fire Training Area
- Fuel Piping and Infrastructure To Be Removed
- Approximate Pit Liner Extent
- Ponded Water Extent (Approximate)
- Pit Fill
- Outer Berm Fill
- MS1 Membrane Monitoring System Port
- **PFAS** Per- and Polyfluoroalkyl Substances
- **DRO** Diesel Range Organics

Site

FIRE TRAINING AREA
FAIRBANKS INTERNATIONAL AIRPORT
FAIRBANKS, ALASKA

Report

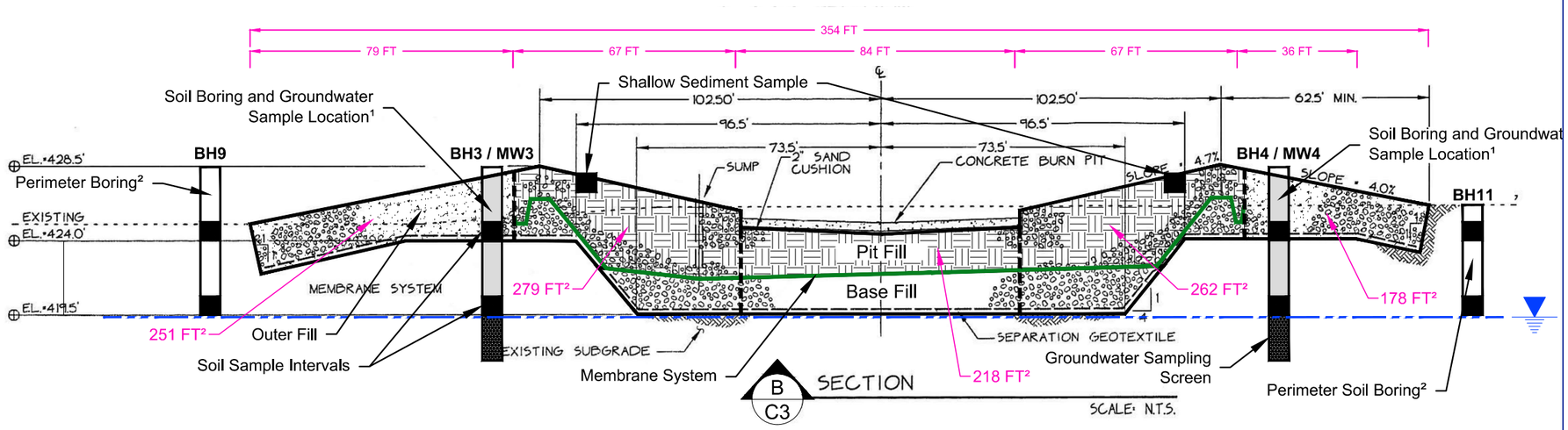
2018 FIRE TRAINING PIT
SITE CHARACTERIZATION

Drawing

FIRE TRAINING PIT AS-BUILT LAYOUT

Date August 2018	Scale 1" = 80 Feet	Fig. No. 3
File Name F3-4-7 FIA Fire Training Pit_18	Project No. 105.00184.18002	

SLR



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES AND UTILITIES ARE SHOWN.

SOURCE NOTES

1. Fairbanks International Airport As-Built Construction Plans, EPA Approved Fire Training Area, Project #: 64848, Alaska Development Services, Inc., May 7, 1992 - June 8, 1993.

LEGEND

EL. = 428.5'	Elevation (Feet)
	Fire Pit Membrane
	Pit Fill
	Outer Berm Fill
	Depth to Groundwater (Approximate)
	Soil Sample Interval
PFAS	Per- and Polyfluoroalkyl Substances
DRO	Diesel Range Organics
FT	Feet
FT²	Square Feet

NOTES

Cross-sectional area shown in square feet for evaluation of waste volumes, see Report Section 7.

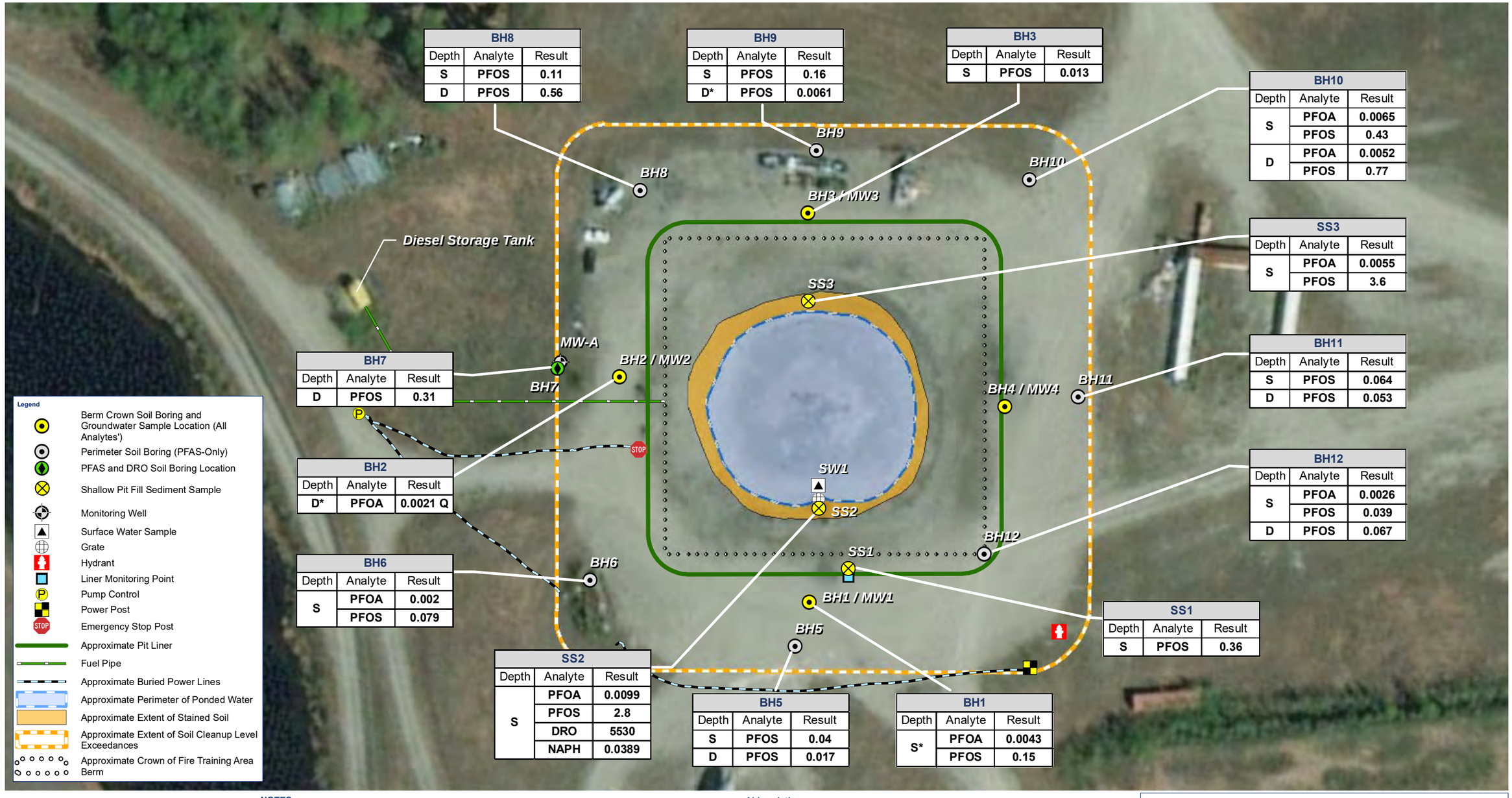
Site
FIRE TRAINING AREA
FAIRBANKS INTERNATIONAL AIRPORT
FAIRBANKS, ALASKA

Report
2018 FIRE TRAINING PIT
SITE CHARACTERIZATION REPORT

Drawing
FIRE TRAINING PIT AS-BUILT CROSS-SECTION

Date August 2018	Scale Not to Scale	Fig. No. 4
File Name F3-4-7 FIA Fire Training Pit_18	Project No. 105.00184.18002	

SLR



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N

Feet
0 30 60 120

SLR

NOTES:
1. Analyte concentrations shown exceed ADEC soil cleanup levels (18 AAC 75.341, Tables 1 and 2). Refer to Report Tables 2 and 3 for comprehensive soil and water sample analytical results.
2. All concentrations are given in units of mg/kg.
3. An asterisk (*) indicates that the higher result of a parent/duplicate sample pair is given.
4. Pit fill analytical results are compared to ADEC soil cleanup levels for the purposes of waste characterization.
5. Estimated berm crown dimensions as determined from historical as-built diagrams and field measurements.
6. The most stringent of applicable ADEC Soil Cleanup Levels for the Under 40-Inch Zone or Migration to Groundwater include:

Analyte	Concentration	Units
1,2,4-TMB	300	mg/kg
DRO	250	mg/kg
NAPH	0.038	mg/kg
PFOA	0.0017	mg/kg
PFOS	0.0030	mg/kg

Abbreviations:

1,2,4-TMB	1,2,4-Trimethylbenzene
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
D	Deep sample depth interval, approximately 4 feet below ground surface
DRO	Diesel range organics
mg/kg	milligrams per kilogram
NAPH	Naphthalene
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
S	Shallow sample depth interval, approximately 1 feet below ground surface

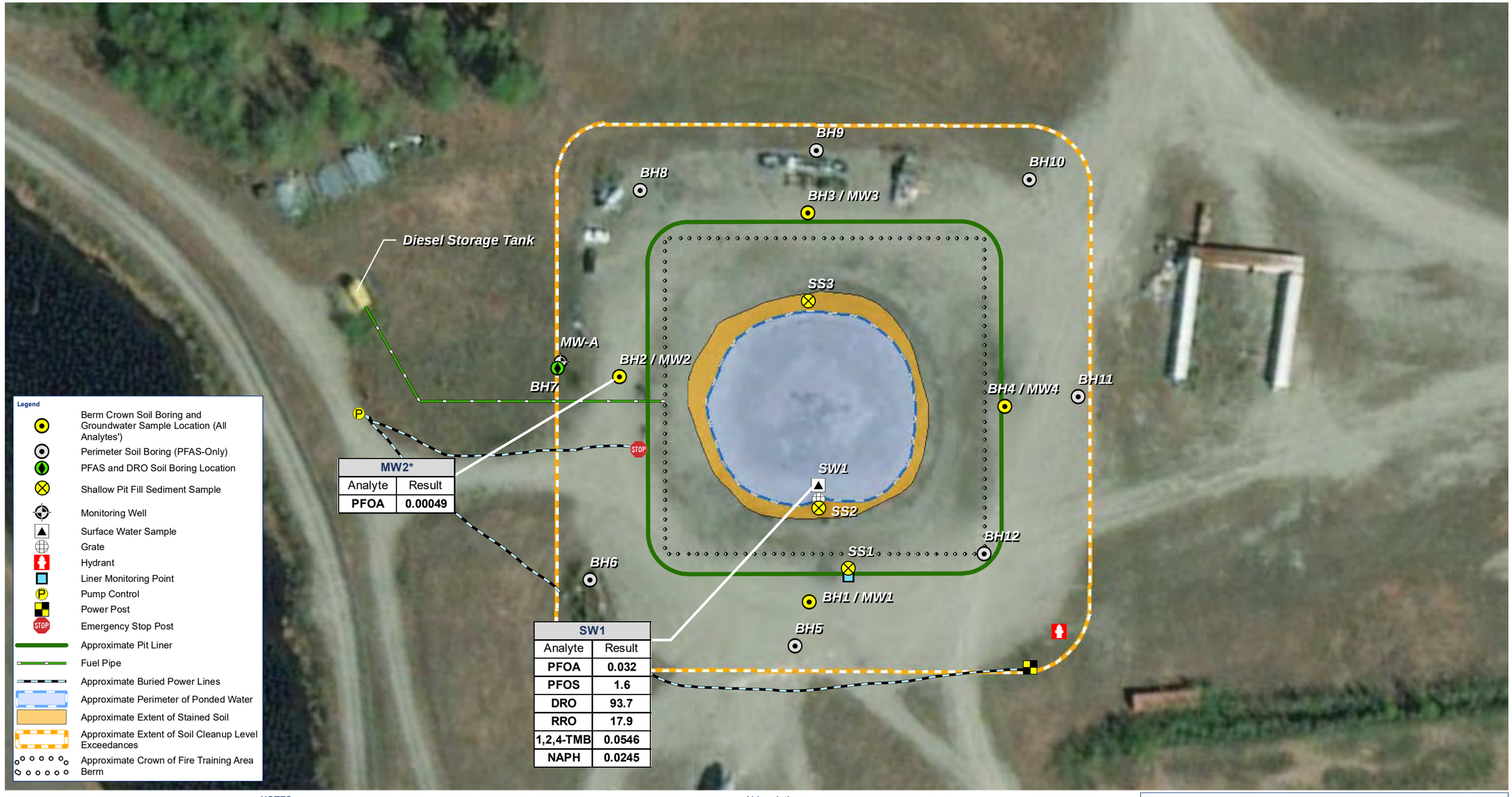
FIRE TRAINING AREA
FAIRBANKS INTERNATIONAL AIRPORT
FAIRBANKS, ALASKA

Report
2018 FIRE TRAINING PIT SITE CHARACTERIZATION

Drawing
SOIL AND PIT FILL SAMPLE RESULTS

Drawing	August 2018	Scale	1 in = 60 feet
File Name	F5 Soil_Pit Fill Samples RPT_18.mxd	Project No.	105.00184.18002

Fig. No. 5



NOTES:

1. Analyte concentrations shown exceed ADEC Groundwater Cleanup Levels (18 AAC 75.345, Table C). Refer to Report Table 3 for comprehensive water sample analytical results.
2. All concentrations are given in units of mg/L.
3. An asterisk (*) indicates that the higher result of a parent/duplicate sample pair is given.
4. Pit ponded water analytical results are compared to ADEC groundwater cleanup levels for the purposes of waste characterization.
5. Estimated berm crown dimensions as determined from historical as-built diagrams and field measurements.
6. Applicable ADEC Groundwater Cleanup Levels include:

Analyte	Concentration	Units
1,2,4-TMB	0.015	mg/L
DRO	1.5	mg/L
NAPH	0.0017	mg/L
PFOA	0.0004	mg/L
PFOS	0.0004	mg/L
RRO	1.1	mg/L

Abbreviations:

1,2,4-TMB	1,2,4-Trimethylbenzene
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
D	Deep sample depth interval, approximately 4 feet below ground surface
DRO	Diesel range organics
mg/L	milligrams per liter
NAPH	Naphthalene
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
RRO	Residual range organics
S	Shallow sample depth interval, approximately 1 feet below ground surface

FIRE TRAINING AREA
FAIRBANKS INTERNATIONAL AIRPORT
FAIRBANKS, ALASKA

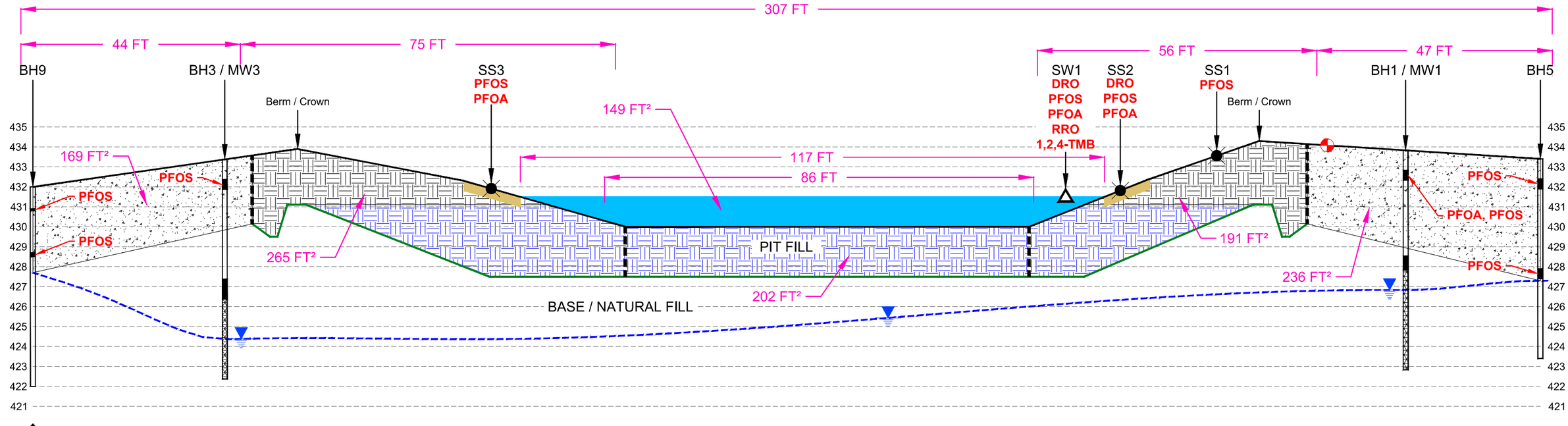
Report
2018 FIRE TRAINING PIT SITE CHARACTERIZATION

Drawing
WATER SAMPLE ANALYTICAL RESULTS

Drawing	August 2018	Scale	1 in = 60 feet
File Name	F6 GW_SW Samples RPT_18.mxd	Project No.	105.00184.18002

Fig. No. 6

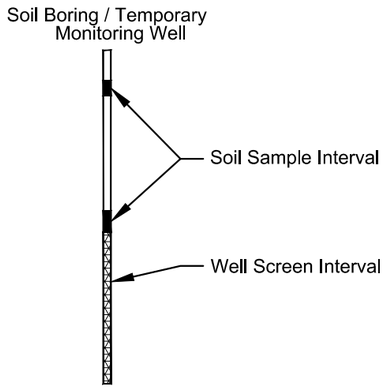
N:\Anchorage\CAD-GIS\PROJECTS\ADOT & PF\2018\FIA Fire Training Pit Site Characterization\mxd\Report\F6 GW_SW Samples RPT_18.mxd



B
C3

LEGEND

- Fire Training Pit Grade (Approximate)
- Pit Fill
- Pit Fill (Saturated)
- Outer Berm Fill
- 432 Elevation (Feet)
- Fire Pit Membrane
- Ponded Water Extent (Approximate)
- Extent of Stained Soil (Approximate)
- Depth to Groundwater (Approximate)
- Shallow Sediment Sample
- Surface Water Sample
- Membrane Monitoring System Port
- **CY** Cubic Yards
- **FT** Feet
- **FT²** Square Feet
- **PFOS** Perfluorooctane Sulfonate
- **PFAS** Perfluorooctanoic Acid
- **DRO** Diesel Range Organics
- **RRO** Residual Range Organics
- **1,2,4-TMB** 1,2,4-Trimethylbenzene



Soil or Water Sample Locations with Cleanup Level Exceedances (Refer to Table 2 for Soil and Table 3 for Water Sample Results) are Shown in Bold Red.

Cross-sectional area shown in square feet for evaluation of waste volumes, see Report Section 7.

HORIZONTAL SCALE: 1" = 20'
WHEN PLOTTED AT 11 x 17 PAGE SIZE
0 20' 40' 60'

VERTICAL SCALE: 1" = 5'
WHEN PLOTTED AT 11 x 17 PAGE SIZE
0 5' 10' 15'

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES AND UTILITIES ARE SHOWN.

Site
FIRE TRAINING AREA
FAIRBANKS INTERNATIONAL AIRPORT
FAIRBANKS, ALASKA

Report
2018 FIRE TRAINING PIT
SITE CHARACTERIZATION

Drawing
FIRE TRAINING PIT CROSS-SECTION

Date August 2018	Scale As Shown	Fig. No. 7
File Name F3-4-7 FIA Fire Training Pit_18	Project No. 105.00184.18002	

SLR

TABLES

Table 1: Field Sample Summary
Fairbanks International Airport Fire Training Pit Site Characterization

Samples			Sample Interval (ft bgs)	Heated Headspace Screening (ppm)	Contaminant of Potential Concern Cleanup Level Exceedances[A]
Sample Type and Matrix		Name			
Site Characterization	Berm Crest Borings	BH1-S/BH97[B]	1.0-1.5	1.9	**PFOA, PFOS**
		BH1-D	5.3-6.0	3.4	--
		BH2-S	0.75-1.25	2.2	--
		BH2-D/BH99[B]	3.0-4.0	10.0	**PFOA**
		BH3-S	1.0-1.5	14.7	**PFOS**
		BH3-D	6.0-7.0	15.5	--
		BH4-S	1.0-1.5	2.3	--
		BH4-D	5.0-6.0	3.3	--
	Berm Perimeter Borings	BH5-S	1.0-1.5	1.3	**PFOS**
		BH5-D	5.5-6.0	1.6	**PFOS**
		BH6-S	1.0	3.3	**PFOA, PFOS**
		BH6-D	5.0-6.0	3.6	--
		BH7-S/BH96[B]	1.0	3.4	--
		BH7-D	3.6	10.0	**PFOS**
		BH8-S	1.0-1.2	4.6	**PFOS**
		BH8-D	3.4-3.6	11.0	**PFOS**
		BH9-S	1.1-1.2	4.7	**PFOS**
		BH9-D/BH98[B]	3.3-3.5	7.0	**PFOS**
		BH10-S	1.0-1.2	2.0	**PFOA, PFOS**
		BH10-D	5.5-6.0	2.5	**PFOA, PFOS**
		BH11-S	1.0-1.5	1.1	**PFOS**
		BH11-D	5.0-5.5	2.0	**PFOS**
		BH12-S	1.0-1.25	3.7	**PFOA, PFOS**
		BH12-D	3.7-4.0	3.1	**PFOS**
	Groundwater samples	MW1	--	--	--
		MW2/MW29[B]	--	--	**PFOA**
		MW3	--	--	--
		MW4	--	--	--
Waste Characterization	Pit Fill Surface Sample	SS1	1.0	1.6	**PFOS**
		SS2	0.5	27.7	**PFOA, PFOS, DRO, Naphthalene**
		SS3	0.5	7.5	**PFOA, PFOS**
	Ponded Water[B]	SW1	0	--	**PFOA, PFOS, DRO, RRO, 1,2,4-Trimethylbenzene, Naphthalene**

Notes

[A] Detailed analytical results for soil are given in Report Tables 2A and 2B and for water in Table 3.

[B] Parent and Duplicate Sample Pair

-- Not applicable

Abbreviations

bgs	below ground surface	PFOS	perfluorooctane sulfonic acid
DRO	diesel range organics	PID	photoionization detector
ft	feet	ppm	parts per million
MW	monitoring well	RRO	residual range organics
PFOA	perfluorooctanoic acid		

Table 2A: Berm Crown Soil and Pit Fill Analytical Results
Fairbanks International Airport Fire Training Pit Site Characterization

Compound in milligrams per kilogram (mg/kg) or milligrams per liter (mg/L)	Screening Criteria			Pit Fill Sample Locations[C]						Berm Crown Subsurface Soil Sample Locations[C]																					
	18 AAC 75.341, Tables B1 and B2 Under 40 Inch Zone[A]	18 AAC 75.341, Tables B1 and B2 Migration to Groundwater[B]	40 CFR Part 261	SS1 1.0 ft		SS2 0.5 ft		SS3 0.5 ft		BH1-S (Primary) 1.0-1.5 ft		BH97 (Duplicate)		BH1-D 5.3-6.0 ft		BH2-S 0.75-1.25 ft		BH2-D (Primary) 3.0-4.0 ft		BH99 (Duplicate) 3.0-4.0 ft		BH3-S 1.0-1.5 ft		BH3-D 6.0-7.0 ft		BH4-S 1.0-1.5 ft		BH4-D 5.0-6.0 ft		Trip Blank 1	
				43259		43259		43259		43258		43258		43258		43258		43258		43258		43258		43258		43258		43258		7-Jun-18	
				K1805460-038 1189378013		K1805460-039 1189378014		K1805460-040 1189378015		K1805460-021 1189378001		K1805460-027		K1805460-022 1189378002		K1805460-003 1189378003		K1805460-004 1189378004		K1805460-025 1189378009		K1805460-001 1189378005		K1805460-002 1189378006		K1805460-015 1189378007		K1805460-016 1189378008		1189378012	
				Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by USEPA Method 537M[F] (mg/kg)																															
PFOA	1.6	0.0017	--	0.00091	J	**0.0099**	=	**0.0055**	=	**0.0043**	=	**0.0027**	=	[0.00042]	U	[0.00036]	UJ	**0.0021**	Q	0.0012	Q	0.00046	J, Q	[0.00046]	UJ	[0.00036]	U	0.0012	=	--	--
PFOS	1.6	0.003	--	**0.36**	=	**2.8**	=	**3.6**	=	**0.1**	**Q+**	**0.15**	=	[0.0004]	U	0.0024	=	[0.00038]	U	[0.00036]	U	**0.013**	=	[0.00044]	U	0.00035	J	0.0002	J	--	--
PFBS	NA	NA	--	0.0021	=	0.01	=	0.0075	=	0.0025	=	0.0026	=	0.00071	J	[0.00034]	U	[0.00038]	U	[0.00036]	U	[0.00034]	U	[0.00044]	U	[0.00034]	U	[0.0004]	U	--	--
PFHxS	NA	NA	--	0.0052	=	0.11	=	0.074	=	0.044	=	0.031	=	0.014	=	0.00098	B	0.0081	J	0.0063	=	0.0011	B	0.0063	=	0.0013	B	0.011	=	--	--
PFHpA	NA	NA	--	0.00049	J	0.0033	=	0.0027	=	0.0012	=	0.0012	=	0.0051	=	[0.00044]	U	[0.00048]	U	[0.00046]	U	[0.00044]	U	[0.00056]	U	[0.00044]	U	[0.00052]	U	--	--
PFNA	NA	NA	--	0.0006	J, B	0.00097	J, B	0.00053	J, Q	0.00059	J, B	0.00073	J, B	0.00023	J, B	0.0003	J, B	0.00022	J, UB	0.00025	J, B	0.00027	J, B	0.00025	J, B	0.00035	J, B	0.00022	J, UB	--	--
GRO, DRO, RRO by Methods AK101, 102, and 103 (mg/kg)																															
Gasoline range organics	1400	300	--	[0.905]	U	0.703	J	[0.86]	U	[0.98]	U	--	--	[1.69]	U	[0.95]	U	[1.89]	U	[2.09]	U	[0.935]	U	1.69	J	[0.88]	U	[1.75]	U	[1.25]	U
Diesel range organics	12500	250	--	[10.5]	U	**5530**	=	62.3	=	[10.2]	U	--	--	[12.4]	U	[10.3]	U	[12.8]	U	[13]	U	[10.2]	U	[12.8]	U	[10.2]	U	[12.4]	U	--	--
Residual range organics	10000	11000	--	[10.5]	U	408	=	19	J	[10.2]	U	--	--	12.8	J	6.43	J	14.2	J	17.5	J	[10.2]	U	8.13	J	[10.2]	U	9.66	J	--	--
VOCs by Method SW8260C (mg/kg)																															
1,1,1,2-Tetrachloroethane	21	0.022	--	[0.00725]	U	[0.00775]	U	[0.0069]	U	[0.00785]	U	--	--	[0.0136]	U	[0.0076]	U	[0.0151]	U	[0.0166]	U	[0.0075]	U	[0.0151]	U	[0.00705]	U	[0.0141]	U	[0.0101]	U
1,1,1-Trichloroethane	360	32	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,1,2,2-Tetrachloroethane	6.1	0.003	--	[0.00453]	U	[0.00486]	U	[0.0043]	U	[0.0049]	U	--	--	[0.00845]	U	[0.00476]	U	[0.00945]	U	[0.0104]	U	[0.00467]	U	[0.0094]	U	[0.00441]	U	[0.00875]	U	[0.0063]	U
1,1,2-Trichloroethane	1.6	0.0014	--	[0.00362]	U	[0.00388]	U	[0.00344]	U	[0.00392]	U	--	--	[0.00675]	U	[0.00381]	U	[0.00755]	U	[0.00835]	U	[0.00374]	U	[0.00755]	U	[0.00353]	U	[0.007]	U	[0.005]	U
1,1-Dichloroethane	46	0.092	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,1-Dichloroethene	330	1.2	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,1-Dichloropropene	--	--	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,2,3-Trichlorobenzene	81	0.15	--	[0.0181]	U	[0.0194]	U	[0.0172]	U	[0.0196]	U	--	--	[0.0339]	U	[0.0191]	U	[0.0378]	U	[0.0416]	U	[0.0187]	U	[0.0377]	U	[0.0176]	U	[0.0351]	U	[0.0251]	U
1,2,3-Trichloropropane	0.066	0.000031	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,2,4-Trichlorobenzene	45	0.082	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,2,4-Trimethylbenzene	43	0.16	--	[0.0181]	U	0.102	=	0.043	=	[0.0196]	U	--	--	[0.0339]	U	[0.0191]	U	[0.0378]	U	[0.0416]	U	[0.0187]	U	[0.0377]	U	[0.0176]	U	[0.0351]	U	[0.0251]	U
1,2-Dibromo-3-chloropropane	--	--	--	[0.0362]	U	[0.0389]	U	[0.0345]	U	[0.0392]	U	--	--	[0.0675]	U	[0.0381]	U	[0.0755]	U	[0.0835]	U	[0.0374]	U	[0.0755]	U	[0.0353]	U	[0.07]	U	[0.05]	U
1,2-Dibromoethane	0.42	0.00024	--	[0.00362]	U	[0.00388]	U	[0.00344]	U	[0.00392]	U	--	--	[0.00675]	U	[0.00381]	U	[0.00755]	U	[0.00835]	U	[0.00374]	U	[0.00755]	U	[0.00353]	U	[0.007]	U	[0.005]	U
1,2-Dichlorobenzene	78	2.4	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,2-Dichloroethane	5.5	0.0055	--	[0.00362]	U	[0.00388]	U	[0.00344]	U	[0.00392]	U	--	--	[0.00675]	U	[0.00381]	U	[0.00755]	U	[0.00835]	U	[0.00374]	U	[0.00755]	U	[0.00353]	U	[0.007]	U	[0.005]	U
1,2-Dichloropropane	11	0.016	--	[0.00362]	U	[0.00388]	U	[0.00344]	U	[0.00392]	U	--	--	[0.00675]	U	[0.00381]	U	[0.00755]	U	[0.00835]	U	[0.00374]	U	[0.00755]	U	[0.00353]	U	[0.007]	U	[0.005]	U
1,3,5-Trimethylbenzene	37	1.3	--	[0.00905]	U	0.0394	=	0.0179	=	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,3-Dichlorobenzene	62	2.3	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
1,3-Dichloropropane	--	--	--	[0.00362]	U	[0.00388]	U	[0.00344]	U	[0.00392]	U	--	--	[0.00675]	U	[0.00381]	U	[0.00755]	U	[0.00835]	U	[0.00374]	U	[0.00755]	U	[0.00353]	U	[0.007]	U	[0.005]	U
1,4-Dichlorobenzene	21	0.037	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
2,2-Dichloropropane	--	--	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
2-Butanone (MEK)	23000	15	--	[0.0905]	U	[0.097]	U	[0.086]	U	[0.098]	U	--	--	[0.169]	U	[0.095]	U	[0.189]	U	[0.209]	U	[0.0935]	U	[0.189]	U	[0.088]	U	[0.176]	U	[0.126]	U
2-Chlorotoluene	--	--	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
2-Hexanone	270	0.11	--	[0.0362]	U	[0.0389]	U	[0.0345]	U	[0.0392]	U	--	--	[0.0675]	U	[0.0381]	U	[0.0755]	U	[0.0835]	U	[0.0374]	U	[0.0755]	U	[0.0353]	U	[0.07]	U	[0.05]	U
4-Chlorotoluene	--	--	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
4-Isopropyltoluene	--	--	--	[0.0362]	U	[0.0389]	U	[0.0345]	U	[0.0392]	U	--	--	[0.0675]	U	[0.0381]	U	[0.0755]	U	[0.0835]	U	[0.0374]	U	[0.0755]	U	[0.0353]	U	[0.07]	U	[0.05]	U
4-Methyl-2-pentanone (MIBK)	2200	18	--	[0.0905]	U	[0.097]	U	[0.086]	U	[0.098]	U	--	--	[0.169]	U	[0.095]	U	[0.189]	U	[0.209]	U	[0.0935]	U	[0.189]	U	[0.088]	U	[0.176]	U	[0.126]	U
Benzene	11	0.022	--	[0.00453]	U	[0.00486]	U	[0.0043]	U	[0.0049]	U	--	--	[0.00845]	U	[0.00476]	U	[0.00945]	U	[0.0104]	U	[0.00467]	U	[0.0094]	U	[0.00441]	U	[0.00875]	U	[0.0063]	U
Bromobenzene	160	0.36	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Bromochloromethane	--	--	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Bromodichloromethane	3.6	0.0043	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Bromoform	240	0.1	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Bromomethane	10	0.024	--	[0.0725]	U	[0.0775]	U	[0.069]	U	[0.0785]	U	--	--	[0.136]	U	[0.076]	U	[0.151]	U	[0.167]	U	[0.075]	U	[0.151]	U	[0.0705]	U	[0.141]	U	[0.101]	U
Carbon disulfide	500	2.9	--	[0.0362]	U	[0.0389]	U	[0.0345]	U	[0.0392]	U	--	--	[0.0675]	U	[0.0381]	U	[0.0755]	U	[0.0835]	U	[0.0374]	U	[0.0755]	U	[0.0353]	U	[0.07]	U	[0.05]	U
Carbon tetrachloride	9.1	0.021	--	[0.00453]	U	[0.00486]	U	[0.0043]	U	[0.0049]	U	--	--	[0.00845]	U	[0.00476]	U	[0.00945]	U	[0.0104]	U	[0.00467]	U	[0.0094]	U	[0.00441]	U	[0.00875]	U	[0.0063]	U
Chlorobenzene	180	0.46	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Chloroethane	1400	72	--	[0.0725]	U	[0.0775]	U	[0.069]	U	[0.0785]	U	--	--	[0.136]	U	[0.076]	U	[0.151]	U	[0.167]	U	[0.075]	U	[0.151]	U	[0.0705]	U	[0.141]	U	[0.101]	U
Chloroform	4	0.0071	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Chloromethane	170	0.61	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
cis-1,2-Dichloroethene	200	0.12	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
cis-1,3-Dichloropropene	21	0.018	--	[0.00453]	U	[0.00486]	U	[0.0043]	U	[0.0049]	U	--	--	[0.00845]	U	[0.00476]	U	[0.00945]	U	[0.0104]	U	[0.00467]	U	[0.0094]	U	[0.00441]	U	[0.00875]	U	[0.0063]	U
Dibromochloromethane	110	0.0027	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Dibromomethane	31	0.025	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Dichlorodifluoromethane	150	3.9	--	[0.0181]	U	[0.0194]	U	[0.0172]	U	[0.0196]	U	--	--	[0.0339]	U	[0.0191]	U	[0.0378]	U	[0.0416]	U	[0.0187]	U	[0.0377]	U	[0.0176]	U	[0.0351]	U	[0.0251]	U
Ethylbenzene	49	0.13	--	[0.00905]	U	0.0159	J	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Freon-113	740	1700	--	[0.0362]	U	[0.0389]	U	[0.0345]	U	[0.0392]	U	--	--	[0.0675]	U	[0.0381]	U	[0.0755]	U	[0.0835]	U	[0.0374]	U	[0.0755]	U	[0.0353]	U	[0.07]	U	[0.05]	U
Hexachlorobutadiene	3.3	0.02	--	[0.00725]	U	[0.00775]	U	[0.0069]	U	[0.00785]	U	--	--	[0.0136]	U	[0.0076]	U	[0.0151]	U	[0.0166]	U	[0.0075]	U	[0.0151]	U	[0.00705]	U	[0.0141]	U	[0.0101]	U
Isopropylbenzene (Cumene)	54	5.6	--	[0.00905]	U	0.014	J	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Methylene chloride	460	0.33	--	[0.0362]	U	[0.0389]	U	[0.0345]	U	[0.0392]	U	--	--	[0.0675]	U	[0.0381]	U	[0.0755]	U	[0.0835]	U	[0.0374]	U	[0.0755]	U	[0.0353]	U	[0.07]	U	[0.05]	U
Methyl-t-butyl ether	670	0.4	--	[0.0362]	U	[0.0389]	U	[0.0345]	U	[0.0392]	U	--	--	[0.0675]	U	[0.0381]	U	[0.0755]	U	[0.0835]	U	[0.0374]	U	[0.0755]	U	[0.0353]	U	[0.07]	U	[0.05]	U

Table 2A: Berm Crown Soil and Pit Fill Analytical Results
Fairbanks International Airport Fire Training Pit Site Characterization

Compound in milligrams per kilogram (mg/kg) or milligrams per liter (mg/L)	Screening Criteria		Pit Fill Sample Locations[C]							Berm Crown Subsurface Soil Sample Locations[C]																							
	18 AAC 75.341, Tables B1 and B2 Under 40 Inch Zone[A]	18 AAC 75.341, Tables B1 and B2 Migration to Groundwater[B]	40 CFR Part 261	SS1 1.0 ft		SS2 0.5 ft		SS3 0.5 ft		BH1-S (Primary) 1.0-1.5 ft		BH97 (Duplicate)		BH1-D 5.3-6.0 ft		BH2-S 0.75-1.25 ft		BH2-D (Primary) 3.0-4.0 ft		BH99 (Duplicate) 3.0-4.0 ft		BH3-S 1.0-1.5 ft		BH3-D 6.0-7.0 ft		BH4-S 1.0-1.5 ft		BH4-D 5.0-6.0 ft		Trip Blank 1	
				43259		43259		43259		43258		43258		43258		43258		43258		43258		43258		43258		43258		43258		7-Jun-18	
				K1805460-038 1189378013		K1805460-039 1189378014		K1805460-040 1189378015		K1805460-021 1189378001		K1805460-027		K1805460-022 1189378002		K1805460-003 1189378003		K1805460-004 1189378004		K1805460-025 1189378009		K1805460-001 1189378005		K1805460-002 1189378006		K1805460-015 1189378007		K1805460-016 1189378008		1189378012	
				Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag		
VOCs by Method SW8260C (Continued) (mg/kg)																																
Naphthalene	29	0.038	--	[0.00905]	U	**0.0389**	=	0.0139	J	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
n-Butylbenzene	20	23	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
n-Propylbenzene	52	9.1	--	[0.00905]	U	0.028	=	0.0074	J	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
o-Xylene	--	--	--	[0.00905]	U	0.0536	=	0.0117	J	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
P & M -Xylene	--	--	--	[0.0181]	U	0.0878	=	0.0112	J	[0.0196]	U	--	--	[0.0339]	U	[0.0191]	U	[0.0378]	U	[0.0416]	U	[0.0187]	U	[0.0377]	U	[0.0176]	U	[0.0351]	U	[0.0251]	U
sec-Butylbenzene	28	42	--	[0.00905]	U	0.00971	J	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Styrene	180	10	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
tert-Butylbenzene	35	11	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
Tetrachloroethene	68	0.19	--	[0.00453]	U	[0.00486]	U	[0.0043]	U	[0.0049]	U	--	--	[0.00845]	U	[0.00476]	U	[0.00945]	U	[0.0104]	U	[0.00467]	U	[0.0094]	U	[0.00441]	U	[0.00875]	U	[0.0063]	U
Toluene	200	6.7	--	[0.00905]	U	0.0107	J	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
trans-1,2-Dichloroethene	960	1.3	--	[0.00905]	U	[0.0097]	U	[0.0086]	U	[0.0098]	U	--	--	[0.0169]	U	[0.0095]	U	[0.0189]	U	[0.0209]	U	[0.00935]	U	[0.0189]	U	[0.0088]	U	[0.0176]	U	[0.0126]	U
trans-1,3-Dichloropropene	21	0.018	--	[0.00453]	U	[0.00486]	U	[0.0043]	U	[0.0049]	U	--	--	[0.00845]	U	[0.00476]	U	[0.00945]	U	[0.0104]	U	[0.00467]	U	[0.0094]	U	[0.00441]	U	[0.00875]	U	[0.0063]	U
Trichloroethene	4.9	0.011	--	[0.00362]	U	[0.00388]	U	[0.00344]	U	[0.00392]	U	--	--	[0.00675]	U	[0.00381]	U	[0.00755]	U	[0.00835]	U	[0.00374]	U	[0.00755]	U	[0.00353]	U	[0.007]	U	[0.005]	U
Trichlorofluoromethane	980	41	--	[0.0181]	U	[0.0194]	U	[0.0172]	U	[0.0196]	U	--	--	[0.0339]	U	[0.0191]	U	[0.0378]	U	[0.0416]	U	[0.0187]	U	[0.0377]	U	[0.0176]	U	[0.0351]	U	[0.0251]	U
Vinyl acetate	1400	1.1	--	[0.0362]	U	[0.0389]	U	[0.0345]	U	[0.0392]	U	--	--	[0.0675]	U	[0.0381]	U	[0.0755]	U	[0.0835]	U	[0.0374]	U	[0.0755]	U	[0.0353]	U	[0.07]	U	[0.05]	U
Vinyl chloride	0.65	0.0008	--	[0.00362]	U	[0.00388]	U	[0.00344]	U	[0.00392]	U	--	--	[0.00675]	U	[0.00381]	U	[0.00755]	U	[0.00835]	U	[0.00374]	U	[0.00755]	U	[0.00353]	U	[0.007]	U	[0.005]	U
Xylenes (total)[E]	57	1.5	--	[0.0271]	U	0.141	=	0.0229	J	[0.0294]	U	--	--	[0.051]	U	[0.0286]	U	[0.0565]	U	[0.0625]	U	[0.0281]	U	[0.0565]	U	[0.0264]	U	[0.0525]	U	[0.0377]	U
PAH SIM by Method SW8270D (mg/kg)																																
1-Methylnaphthalene	68	0.41	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
2-Methylnaphthalene	310	1.3	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Acenaphthene	4600	37	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Acenaphthylene	2300	18	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Anthracene	23000	390	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Benzo(a)anthracene	2	0.28	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Benzo[a]pyrene	0.2	0.27	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Benzo[b]fluoranthene	2	2.7	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Benzo[g,h,i]perylene	2300	15000	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Benzo[k]fluoranthene	20	27	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Chrysene	200	82	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Dibenzo[a,h]anthracene	0.2	0.87	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Fluoranthene	3100	590	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Fluorene	3100	36	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Indeno[1,2,3-c,d] pyrene	2	8.8	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Naphthalene	29	0.038	--	--	--	--	--	--	--	[0.0103]	U	--	--	[0.0125]	U	[0.0103]	U	[0.0129]	U	[0.0131]	U	[0.0103]	U	[0.0127]	U	[0.0101]	U	[0.0124]	U	--	--
Phenanthrene	2300	39	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
Pyrene	2300	87	--	--	--	--	--	--	--	[0.0129]	U	--	--	[0.0156]	U	[0.0128]	U	[0.0162]	U	[0.0163]	U	[0.0128]	U	[0.0159]	U	[0.0127]	U	[0.0154]	U	--	--
TCLP RCRA Metals by Method SW6020A (mg/L)																																
Arsenic	--	--	5	--	--	--	--	--	--	[0.125]	U	--	--	[0.125]	U	[0.125]	U	[0.125]	U	[0.125]	U	[0.125]	U	[0.125]	U	[0.125]	U	[0.125]	U	--	--
Barium	--	--	100	--	--	--	--	--	--	0.371	=	--	--	0.674	=	0.267	=	0.744	=	0.677	=	0.29	=	0.567	=	0.383	=	0.629	=	--	--
Cadmium	--	--	1	--	--	--	--	--	--	[0.05]	U	--	--	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	--	--
Chromium	--	--	5	--	--	--	--	--	--	0.148	J	--	--	0.114	J	[0.1]	U	0.136	J	0.0859	J, B	0.17	J	0.115	J	0.138	J	0.112	J	--	--
Lead	--	--	5	--	--	--	--	--	--	0.0598	=	--	--	0.0292	J	[0.025]	U	[0.025]	U	0.0453	J	[0.025]	U	0.021	J	[0.025]	U	[0.025]	U	--	--
Mercury	--	--	0.2	--	--	--	--	--	--	[0.005]	U	--	--	[0.005]	U	[0.005]	U	0.00385	J, B	[0.005]	U	0.00362	J, B	0.00437	J, B	0.00372	J, B	[0.005]	U	--	--
Selenium	--	--	1	--	--	--	--	--	--	[0.5]	U	--	--	[0.5]	U	[0.5]	U	[0.5]	U	[0.5]	U	[0.5]	U	[0.5]	U	[0.5]	U	[0.5]	U	--	--
Silver	--	--	5	--	--	--	--	--	--	[0.05]	U	--	--	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	--	--
Total Solids by SM21 2540G (%)																																
Total solids	--	--	--	94.9	=	88.2	=	88.3	=	96.8	=	92.6	=	79.9	=	97	=	76.9	=	76.5	=	97	=	78	=	97.5	=	80.3	=	--	--

Notes:

3.6	**BOLD** and yellow values indicate an exceedance of Method Two cleanup levels for the Under 40 Inch Sone, refer to Notes B
0.099	**BOLD** values indicate an exceedance of Method Two cleanup levels for Migration to Groundwater, refer to Notes B
[0.00362]	Green values indicate undetectable results with LODs above applicable ADEC screening criteria.
A	ADEC Method Two cleanup levels for the Under 40 Inch Zone, lowest of ingestion or inhalation, 18 AAC 75.341, Tables B1 and B2 (November 7, 2017).
B	ADEC Method Two cleanup levels Migration to Groundwater for the Under 40 Inch Zone, 18 AAC 75.341, Tables B1 and B2 (November 7, 2017).
C	The field sample identification number, date collected, and laboratory sample identification number are provided.
D	For detected results, the sample result is listed in mg/kg, or mg/L (TCLP RCRA metals), in this column. If an analyte was not detected, then the highest LOD is shown in [brackets].
E	Total values were the summation of detected compounds only. If compounds were not detected, then the highest LOD was listed.
F	For PFCs by Method 537M, per ADEC guidance (April, 2017) twice the DL was used to estimate the LOD.

Data Flags

=	Detected value above the LOQ.
J	Result is considered an estimated value because the level is below the laboratory LOQ, but above the DL.
U	Undetectable, LOD is listed in brackets to the right.
B	Results are considered estimated due to blank contamination.
UB	Results are considered estimated due to blank contamination. The blank contamination was higher than the sample detection. Possibly a false positive result.
UJ	Undetectable, the LOD is an estimated value.
Q	Results are considered estimated due to laboratory quality control criteria failure or matrix effect. A "+" or a "-" is

Abbreviations

--	Not applicable or screening criteria does not exist for this compound	DRO	Diesel range organic diesel range organics	PAH	polycyclic aromatic hydrocarbons	PFOA	perfluorooctanoic acid	TCLP	Toxicity Characteristic Leaching Procedure
AAC	Alaska Administrative Code	GRO	gasoline range organics	PFAS	per- and polyfluoroalkyl substances	PFNA	perfluorononanoic acid	USEPA	United States Environmental Protection Agency
ADEC	Alaska Department of Environmental Conservation	LOD	limit of detection	PFBS	perfluorobutane sulfonic acid	RCRA	Resource and Conservation Recovery Act	VOC	volatile organic compounds
AK	Alaska	LOQ	limit of quantitation	PFHxS	perfluorohexane sulfonic acid	RRO	residual range organics		
CFR	Code of Federal Regulations	mg/kg	milligrams per kilogram	PFOS	perfluorooctane sulfonic acid	SIM	selective ion monitoring		
DL	detection limit	mg/L	milligrams per liter	PFHpA	perfluoroheptanoic acid	SM	Standard Methods		

Table 2B: Perimeter Soil Boring Analytical Results
Fairbanks International Airport Fire Training Pit Site Characterization

Compound in milligrams per kilogram (mg/kg) or milligrams per liter (mg/L)	Screening Criteria		Perimeter Boring Subsurface Soil Sample Locations[C]																																			
	18 AAC 75.341, Tables B1 and B2 Under 40 Inch Zone[A]	18 AAC 75.341, Tables B1 and B2 Migration to Groundwater[B]	BH5-S 1.0-1.5 ft		BH5-D 5.5-6.0 ft		BH6-S 1.0 ft		BH6-D 5.0-6.0 ft		BH7-S 1.0 ft (Primary)		BH96 1.0 ft (Duplicate)		BH7-D 3.6 ft		BH8-S 1.0-1.2 ft		BH8-D 3.4-3.6 ft		BH9-S 1.1-1.2 ft		BH9-D 3.3-3.5 ft (Primary)		BH98 3.3-3.5 ft (Duplicate)		BH10-S 1.0-1.2 ft		BH10-D 5.5-6.0 ft		BH11-S 1.0-1.5 ft		BH11-D 5.0-5.5 ft		BH12-S 1.0-1.25 ft		BH12-D 3.7-4.0 ft		Trip Blank 1	
			7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18		7-Jun-18	
			K1805460-023		K1805460-024		K1805460-007		K1805460-008		K1805460-006 1189378011		1189378023		K1805460-005 1189378010		K1805460-009		K1805460-010		K1805460-011		K1805460-012		K1805460-026		K1805460-013		K1805460-014		K1805460-017		K1805460-018		K1805460-019		K1805460-020		1189378012	
			Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	Flag	Conc.[D]	
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by USEPA Method 537M[F] (mg/kg)																																						
PFOA	1.6	0.0017	0.00032	J	0.00029	J	**0.002**	Q	[0.00038]	UJ	0.00074	J, Q	--	--	[0.00038]	UJ	[0.00036]	UJ	0.0013	Q	0.00045	J, Q	0.0014	=	0.0016	=	**0.0065**	=	**0.0052**	=	0.00036	J	0.00037	J	**0.0026**	=	0.0011	J	--	--
PFOS	1.6	0.003	**0.04**	=	**0.017**	=	**0.079**	=	0.00021	J	0.00026	J	--	--	**0.31**	=	**0.11**	=	**0.56**	=	**0.16**	=	**0.0061**	=	**0.0055**	=	**0.43**	=	**0.77**	=	**0.064**	=	**0.053**	=	**0.039**	=	**0.067**	=	--	--
PFBS	NA	NA	[0.00034]	U	0.0003	J	[0.00034]	U	[0.00036]	U	[0.00044]	U	--	--	[0.00036]	U	[0.00034]	U	[0.00038]	U	[0.00038]	U	[0.00044]	U	[0.00038]	U	[0.00038]	U	0.00024	J	[0.00034]	U	[0.00034]	U	[0.00034]	U	0.00045	J	--	--
PFHxS	NA	NA	0.0011	=	0.011	=	0.00092	J, B	0.0041	=	0.058	=	--	--	0.00096	J, B	[0.00034]	U	0.0046	=	0.0042	=	0.01	=	0.014	=	0.023	=	0.056	=	0.00075	J, B	0.0018	B	0.024	=	0.0021	B	--	--
PFHpA	NA	NA	[0.00044]	U	[0.00044]	U	[0.00044]	U	0.00038	J	[0.00056]	U	--	--	[0.00046]	U	[0.00044]	U	[0.0005]	U	[0.0005]	U	[0.00056]	U	[0.0005]	U	0.00031	J	0.0008	J	[0.00044]	U	[0.00044]	U	0.0006	J	[0.00052]	U	--	--
PFNA	NA	NA	0.0006	J, B	0.00023	J, B	0.0012	B	0.00027	J, B	0.00031	J, B	--	--	0.00029	J, B	0.00033	J, B	0.00035	J, B	0.00033	J, B	0.00033	J, B	0.00036	J, B	0.00082	J, B	0.0011	B	0.00055	J, B	0.00055	J, B	0.00031	J, B	0.00061	J, B	--	--
GRO, DRO, RRO by Methods AK101, 102, and 103 (mg/kg)																																						
Gasoline range organics	1400	300	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	[1.25]	U
Diesel range organics	12500	250	--	--	--	--	--	--	--	--	[10.4]	U	7.22	J	[12.6]	U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Residual range organics	10000	11000	--	--	--	--	--	--	--	--	14.9	J	13.9	J	12.8	J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Solids by SM21 2540G (%)																																						
Total solids	--	--	97.8	=	91.2	=	96.8	=	96.4	=	95.3	=	96.1	=	96.5	=	97.8	=	79.8	=	84.8	=	74.9	=	75.6	=	97.2	=	97.4	=	97.6	=	97.5	=	96.2	=	78.8	=	--	--

Notes:

3.6	**BOLD** and yellow values indicate an exceedance of Method Two cleanup levels for the Under 40 Inch Sone, refer to Notes B
0.099	**BOLD** values indicate an exceedance of Method Two cleanup levels for Migration to Groundwater, refer to Notes B
[0.00362]	Green values indicate undetectable results with LODs above applicable ADEC screening criteria.
A	ADEC Method Two cleanup levels for the Under 40 Inch Zone, lowest of ingestion or inhalation, 18 AAC 75.341, Tables B1 and B2 (November 7, 2017).
B	ADEC Method Two cleanup levels Migration to Groundwater for the Under 40 Inch Zone, 18 AAC 75.341, Tables B1 and B2 (November 7, 2017).
C	The field sample identification number, date collected, and laboratory sample identification number are provided.
D	For detected results, the sample result is listed in mg/kg, or mg/L (TCLP RCRA metals), in this column. If an analyte was not detected, then the highest LOD is shown i
E	Total values were the summation of detected compounds only. If compounds were not detected, then the highest LOD was listed.
F	For PFCs by Method 537M, per ADEC guidance (April, 2017) twice the DL was used to estimate the LOD.

Data Flags

=	Detected value above the LOQ.
J	Result is considered an estimated value because the level is below the laboratory LOQ, but above the DL.
U	Undetectable, LOD is listed in brackets to the right.
B	Results are considered estimated due to blank contamination.
UB	Results are considered estimated due to blank contamination. The blank contamination was higher than the sample detection. Possibly a false positive result.
UJ	Undetectable, the LOD is an estimated value.
Q	Results are considered estimated due to laboratory quality control criteria failure or matrix

Abbreviations

--	Not applicable or screening criteria does not exist for this compound	GRO	gasoline range organics	PFBS	perfluorobutane sulfonic acid	RRO	residual range organics
AAC	Alaska Administrative Code	LOD	limit of detection	PFHxS	perfluorohexane sulfonic acid	SIM	selective ion monitoring
ADEC	Alaska Department of Environmental Conservation	LOQ	limit of quantitation	PFOS	perfluorooctane sulfonic acid	SM	Standard Methods
AK	Alaska	mg/kg	milligrams per kilogram	PFHpA	perfluoroheptanoic acid	TCLP	Toxicity Characteristic Leaching Procedure
CFR	Code of Federal Regulations	mg/L	milligrams per liter	PFOA	perfluorooctanoic acid	USEPA	United States Environmental Protection Agency
DL	detection limit	PAH	polycyclic aromatic hydrocarbons	PFNA	perfluorononanoic acid	VOC	volatile organic compounds
DRO	diesel range organics	PFAS	per- and polyfluoroalkyl substances	RCRA	Resource and Conservation Recovery Act		

Table 3: Groundwater and Surface Water Analytical Results
Fairbanks International Airport Fire Training Pit Site Characterization

Compound in milligrams per liter (mg/L)	Screening Criteria	Sample Locations[B]												Trip Blank	
		Ponded Water		Groundwater											
	18 AAC 75, Table C, Groundwater Cleanup Levels[A]	SW1		MW1		MW2 (Primary)		MW29 (Duplicate)		MW3		MW4		Trip Blank 2	
		08-Jun-18		07-Jun-18		07-Jun-18		07-Jun-18		07-Jun-18		07-Jun-18		07-Jun-18	
		K1805460-037		K1805460-032		K1805460-034		K1805460-036		K1805460-033		K1805460-035		1189378022	
		1189378021		1189378016		1189378017		1189378020		1189378018		1189378019			
		Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag
Perfluorinated Sulfonic Acids and Perfluorinated Carboxylic Acids by USEPA Method 537M[E]															
PFOA	0.0004	**0.032**	=	0.000013	J	**0.00049**	=	**0.00047**	=	0.000055	=	0.000061	=	--	--
PFOS	0.0004	**1.6**	=	[0.00002]	U	0.000047	J	0.000059	=	0.000086	=	0.000056	=	--	--
PFBS	NA	0.051	=	0.0039	=	0.0015	=	0.0014	=	0.00089	=	0.00018	=	--	--
PFHxS	NA	0.42	=	0.0003	=	0.015	=	0.013	=	0.0015	=	0.003	=	--	--
PFHpA	NA	0.019	=	0.00018	=	0.00081	=	0.00078	=	0.0001	=	0.00013	=	--	--
PFNA	NA	0.0013	J,B	[0.0000188]	U	0.000011	J,B	0.0000094	J,B	0.000002	J,B	0.0000011	J,UB	--	--
GRO, DRO, RRO by Methods AK101, 102, and 103															
Gasoline range organics	2.2	0.599	=	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U	[0.05]	U
Diesel range organics	1.5	**93.7**	=	0.184	J	0.179	J	0.21	J	0.27	J	0.234	J	--	--
Residual range organics	1.1	**17.9**	=	0.196	J	0.184	J	0.191	J	0.194	J	0.188	J	--	--
VOCs by Method SW8260C															
1,1,1,2-Tetrachloroethane	0.0057	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
1,1,1-Trichloroethane	8	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,1,2,2-Tetrachloroethane	0.00076	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
1,1,2-Trichloroethane	0.00041	[0.0002]	U	[0.0002]	U	[0.0002]	U	[0.0002]	U	[0.0002]	U	[0.0002]	U	[0.0002]	U
1,1-Dichloroethane	0.028	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,1-Dichloroethene	0.28	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,1-Dichloropropene	--	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,2,3-Trichlorobenzene	0.007	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,2,3-Trichloropropane	0.0000075	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,2,4-Trichlorobenzene	0.004	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,2,4-Trimethylbenzene	0.015	**0.0546**	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,2-Dibromo-3-chloropropane	--	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U
1,2-Dibromoethane	0.000075	[0.0000375]	U	[0.0000375]	U	[0.0000375]	U	[0.0000375]	U	[0.0000375]	U	[0.0000375]	U	[0.0000375]	U
1,2-Dichlorobenzene	0.3	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,2-Dichloroethane	0.0017	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
1,2-Dichloropropane	0.0044	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,3,5-Trimethylbenzene	0.12	0.0383	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,3-Dichlorobenzene	0.3	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
1,3-Dichloropropane	--	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
1,4-Dichlorobenzene	0.0048	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
2,2-Dichloropropane	--	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
2-Butanone (MEK)	5.6	0.0134	=	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U
2-Chlorotoluene	--	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
2-Hexanone	0.038	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U
4-Chlorotoluene	--	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
4-Isopropyltoluene	--	0.00447	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
4-Methyl-2-pentanone (MIBK)	6.3	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U
Benzene	0.0046	0.00111	=	[0.0002]	U	[0.0002]	U	[0.0002]	U	[0.0002]	U	[0.0002]	U	[0.0002]	U
Bromobenzene	0.062	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Bromochloromethane	--	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Bromodichloromethane	0.0013	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
Bromoform	0.033	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Bromomethane	0.0075	[0.0025]	U	[0.0025]	U	[0.0025]	U	[0.0025]	U	[0.0025]	U	[0.0025]	U	[0.0025]	U
Carbon disulfide	0.81	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U
Carbon tetrachloride	0.0046	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U

Table 3: Groundwater and Surface Water Analytical Results
Fairbanks International Airport Fire Training Pit Site Characterization

Compound in milligrams per liter (mg/L)	Screening Criteria	Sample Locations[B]												Trip Blank	
		Ponded Water		Groundwater											
	18 AAC 75, Table C, Groundwater Cleanup Levels[A]	SW1 08-Jun-18 K1805460-037 1189378021		MW1 07-Jun-18 K1805460-032 1189378016		MW2 (Primary) 07-Jun-18 K1805460-034 1189378017		MW29 (Duplicate) 07-Jun-18 K1805460-036 1189378020		MW3 07-Jun-18 K1805460-033 1189378018		MW4 07-Jun-18 K1805460-035 1189378019		Trip Blank 2 07-Jun-18 1189378022	
		Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag
VOCs by Method SW8260C (continued)															
Chlorobenzene	0.078	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
Chloroethane	21	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Chloroform	0.0022	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Chloromethane	0.19	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
cis-1,2-Dichloroethene	0.036	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
cis-1,3-Dichloropropene	0.0047	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
Dibromochloromethane	0.0087	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U	[0.00025]	U
Dibromomethane	0.0083	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Dichlorodifluoromethane	0.2	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Ethylbenzene	0.015	0.00747	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Freon-113	55	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U
Hexachlorobutadiene	0.0014	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Isopropylbenzene (Cumene)	0.45	0.00547	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Methylene chloride	0.11	[0.0025]	U	[0.0025]	U	[0.0025]	U	[0.0025]	U	[0.0025]	U	[0.0025]	U	[0.0025]	U
Methyl-t-butyl ether	0.14	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U
Naphthalene	0.0017	**0.0245**	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
n-Butylbenzene	1	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
n-Propylbenzene	0.66	0.00404	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
o-Xylene	0.19	0.0617	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
P & M -Xylene	0.19	0.1	=	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U
sec-Butylbenzene	2	0.00429	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Styrene	1.2	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
tert-Butylbenzene	0.69	0.00058	J	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Tetrachloroethene	0.041	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Toluene	1.1	0.00854	=	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
trans-1,2-Dichloroethene	0.36	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
trans-1,3-Dichloropropene	0.0047	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Trichloroethene	0.0028	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Trichlorofluoromethane	5.2	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U	[0.0005]	U
Vinyl acetate	0.41	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U	[0.005]	U
Vinyl chloride	0.00019	[0.000075]	U	[0.000075]	U	[0.000075]	U	[0.000075]	U	[0.000075]	U	[0.000075]	U	[0.000075]	U
Xylenes (total)[D]	0.19	0.162	=	[0.0015]	U	[0.0015]	U	[0.0015]	U	[0.0015]	U	[0.0015]	U	[0.0015]	U
PAH SIM by Method SW8270D															
1-Methylnaphthalene	0.011	0.00619	=	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
2-Methylnaphthalene	0.036	[0.000254]	U	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Acenaphthene	0.53	[0.000254]	U	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Acenaphthylene	0.26	[0.000254]	U	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Anthracene	0.043	[0.000254]	U	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Benzo(a)anthracene	0.00012	[0.0000254]	UJ	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Benzo[a]pyrene	0.000034	[0.0000101]	UJ	[0.0000098]	U	[0.0000104]	U	[0.0000104]	U	[0.0000106]	U	[0.0000108]	U	--	--
Benzo[b]fluoranthene	0.00034	[0.0000254]	UJ	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Benzo[g,h,i]perylene	0.00026	[0.0000254]	UJ	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Benzo[k]fluoranthene	0.0008	[0.0000254]	UJ	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Chrysene	0.002	[0.0000254]	UJ	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Dibenzo[a,h]anthracene	0.000034	[0.0000101]	UJ	[0.0000098]	U	[0.0000104]	U	[0.0000104]	U	[0.0000106]	U	[0.0000108]	U	--	--

Table 3: Groundwater and Surface Water Analytical Results
Fairbanks International Airport Fire Training Pit Site Characterization

Compound in milligrams per liter (mg/L)	Screening Criteria	Sample Locations[B]												Trip Blank	
		Ponded Water		Groundwater											
	18 AAC 75, Table C, Groundwater Cleanup Levels[A]	SW1 08-Jun-18 K1805460-037 1189378021		MW1 07-Jun-18 K1805460-032 1189378016		MW2 (Primary) 07-Jun-18 K1805460-034 1189378017		MW29 (Duplicate) 07-Jun-18 K1805460-036 1189378020		MW3 07-Jun-18 K1805460-033 1189378018		MW4 07-Jun-18 K1805460-035 1189378019		Trip Blank 2 07-Jun-18 1189378022	
		Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag	Conc.[C]	Flag
PAH SIM by Method SW8270D (continued)															
Fluoranthene	0.26	[0.0000254]	UJ	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Fluorene	0.29	0.00125	=	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Indeno[1,2,3-c,d] pyrene	0.00019	[0.0000254]	UJ	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Naphthalene	0.0017	**0.00239**	=	[0.000049]	U	[0.0000515]	U	[0.0000515]	U	[0.000053]	U	[0.000054]	U	--	--
Phenanthrene	0.17	[0.000254]	U	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
Pyrene	0.12	[0.0000254]	UJ	[0.0000245]	U	[0.0000259]	U	[0.0000259]	U	[0.0000265]	U	[0.000027]	U	--	--
TCLP RCRA Metals by Method SW6020A															
Arsenic[F]	0.00052	**0.0174**	=	**0.00154**	J	**0.0103**	=	**0.0135**	=	**0.00274**	J	**0.00237**	J	--	--
Barium	3.8	0.113	=	0.182	=	0.277	=	0.368	=	0.21	=	0.155	=	--	--
Cadmium	0.0092	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U	--	--
Chromium	22	[0.002]	UJ	[0.002]	UJ	0.0094	Q	0.0236	Q	[0.002]	UJ	0.00351	J, Q	--	--
Lead	0.015	0.00295	Q	[0.0005]	UJ	0.00747	Q	0.0113	Q	0.00164	Q	0.00227	Q	--	--
Mercury	0.00052	[0.0001]	U	0.0000667	J, UB	0.000171	J,B	0.0000952	J,B	0.0000883	J,B	0.0000734	J, UB	--	--
Selenium	0.1	[0.01]	U	[0.01]	U	[0.01]	U	[0.01]	U	[0.01]	U	0.00634	J	--	--
Silver	0.094	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U	[0.001]	U	--	--

Notes:

3.6	**BOLD** values indicate an exceedance of ADEC Groundwater Cleanup Levels, see Note A.
[0.00025]	Green values indicate undetectable results with LODs above applicable ADEC screening criteria.
A	ADEC Method Two Groundwater Cleanup Levels , 18 AAC 75.345, Table C (November 7, 2017).
B	The field sample identification number, date collected, and laboratory sample identification number are provided.
C	For detected results, the sample result is listed in mg/L in this column. If an analyte was not detected, then the highest LOD is shown in [brackets].
D	Total values were the summation of detected compounds only. If compounds were not detected, then the highest LOD
E	For PFAS by USEPA Method 537M, per ADEC guidance (April, 2017) twice the DL was used to estimate the LOD.
F	Arsenic concentrations are generally attributed to natural conditions (site soils), typical of the area, and not considered a site contaminant.

Data Flags:

=	Detected value above the LOQ.
J	Estimated value because the concentration is below the laboratory LOQ, but above the DL.
U	Undetectable, LOD is listed in brackets to the right.
B	Results are considered estimated due to blank contamination.
UB	Estimated results due to blank contamination. The blank contamination was higher than the sample detection; potentially a false positive result.
UJ	Undetectable, the LOD is an estimated value.
Q	Estimated value due to laboratory quality control criteria failure or matrix effect. A "+" or a "-" is used as applicable to indicate a high or low bias respectively.

Abbreviations:

--	Not applicable or no applicable screening level
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska Method
DL	detection limit
DRO	diesel range organics
GRO	gasoline range organics
LOD	limit of detection
LOQ	limit of quantitation
mg/L	milligrams per liter
PAH	polycyclic aromatic hydrocarbons
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonic acid
PFHxS	perfluorohexane sulfonic acid
PFOS	perfluorooctane sulfonic acid
PFHpA	perfluoroheptanoic acid
PFOA	perfluorooctanoic acid
PFNA	perfluorononanoic acid
RCRA	Resource and Conservation Recovery Act
RRO	residual range organics
SIM	selective ion monitoring
USEPA	United States Environmental Protection Agency
VOC	volatile organic compounds

APPENDICES

Appendix A Survey Data

Appendix B Laboratory Data Quality Assurance Review

Appendix C Field Notebook

Appendix D Field Forms

Appendix E Photograph Log

Appendix F Waste Volume Calculations

Project file data		Coordinate System	
Name:	C:\Users\robbo\Desktop\New folder (2)\Baseline processing SLR.vce	Name:	United States/State Plane 1983
Size:	595 KB	Datum:	NAD 1983 (Alaska)
Modified:	6/19/2018 9:01:28 AM (UTC:-8)	Zone:	Alaska Zone 3 5003
Time zone:	Alaskan Standard Time	Geoid:	GEOID12B (Alaska)
Reference number:		Vertical datum:	
Description:		Calibrated site:	
Comment 1:			
Comment 2:			
Comment 3:			

Baseline Processing Report

Processing Summary

Observation	From	To	Solution Type	H. Prec. (US survey foot)	V. Prec. (US survey foot)	Geodetic Az.	Ellipsoid Dist. (US survey foot)	ΔHeight (US survey foot)
11:50:48 AM - 2:12:14 PM (C3)	CLGO	11:50:48 AM - 2:12:14 PM (C3)	N/A	?	?	?	?	?

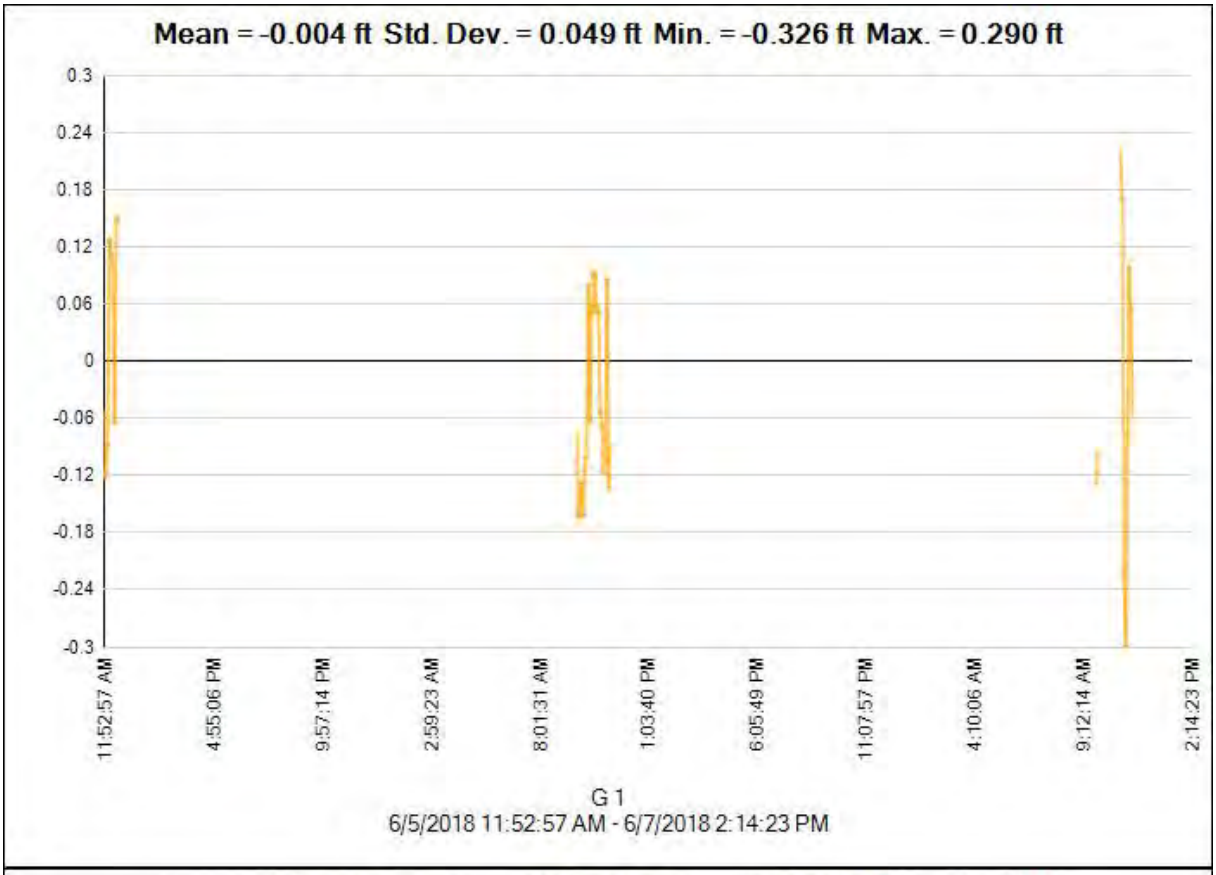
Acceptance Summary

Processed	Passed	Flag	Fail
1	1	0	0

CLGO (11:50:48 AM-2:12:14 PM) (S1)

Trajectory observation:	11:50:48 AM - 2:12:14 PM (C3)				
Processed:	6/19/2018 8:49:33 AM				
Frequency used:	Multiple Frequencies				
Solutions:	1505	(0 Passed		0	1505
		1485 Fixed	0 Float	20 DGPS)	
Estimated accuracies:	0 - 5 cm:	-			
	5 - 15 cm:	98.70%			
	15 - 30 cm:	-			
	30 - 50 cm:	0.10%			
	0.5 - 1 m:	0.90%			
	1 - 2 m:	0.30%			
	2 - 5 m:	-			
	> 5 m:	-			
Ephemeris used:	Mixed				
Antenna model:	NGS Absolute				
Processing start time:	6/5/2018 11:50:48 AM (Local: UTC-8hr)				
Processing stop time:	6/7/2018 2:12:14 PM (Local: UTC-8hr)				
Processing duration:	2.02:21:26				
Processing interval:	1 second				

Residuals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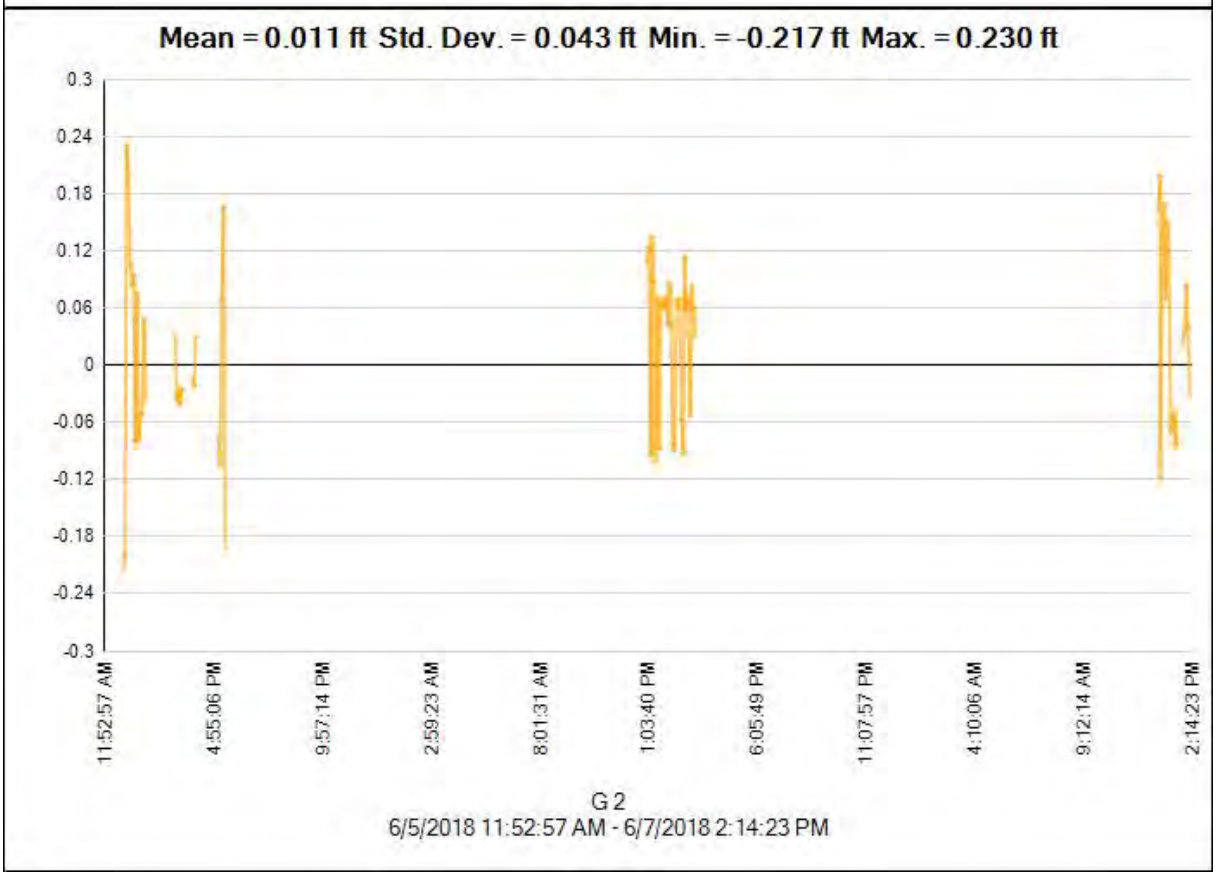
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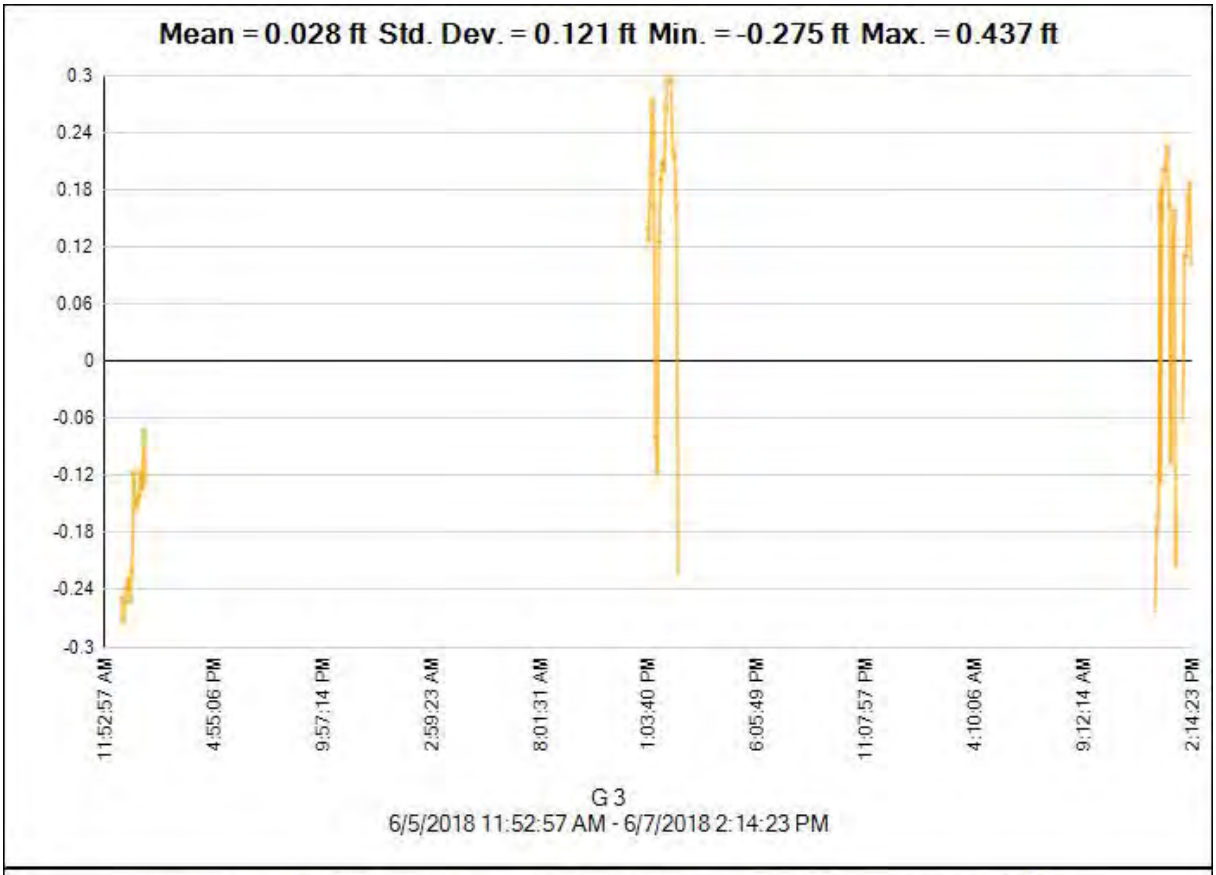
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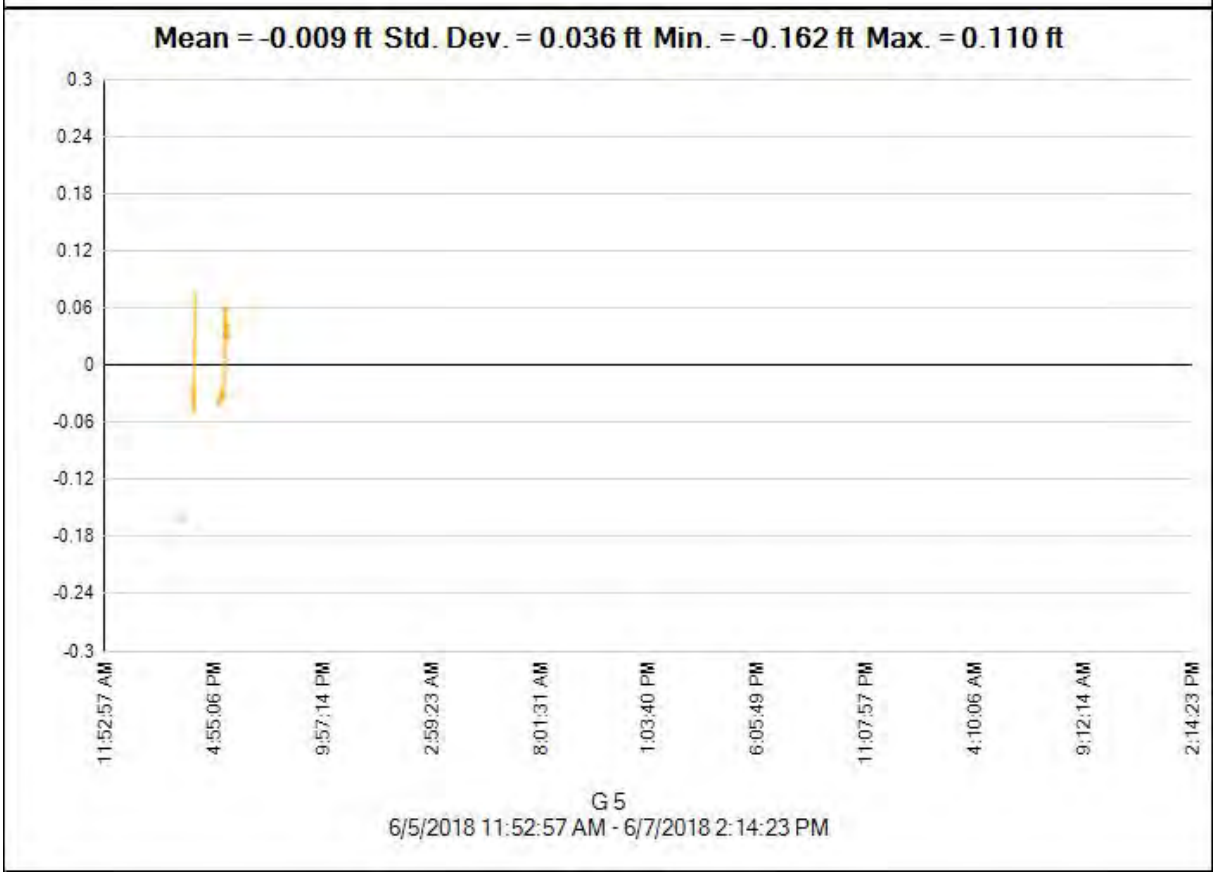
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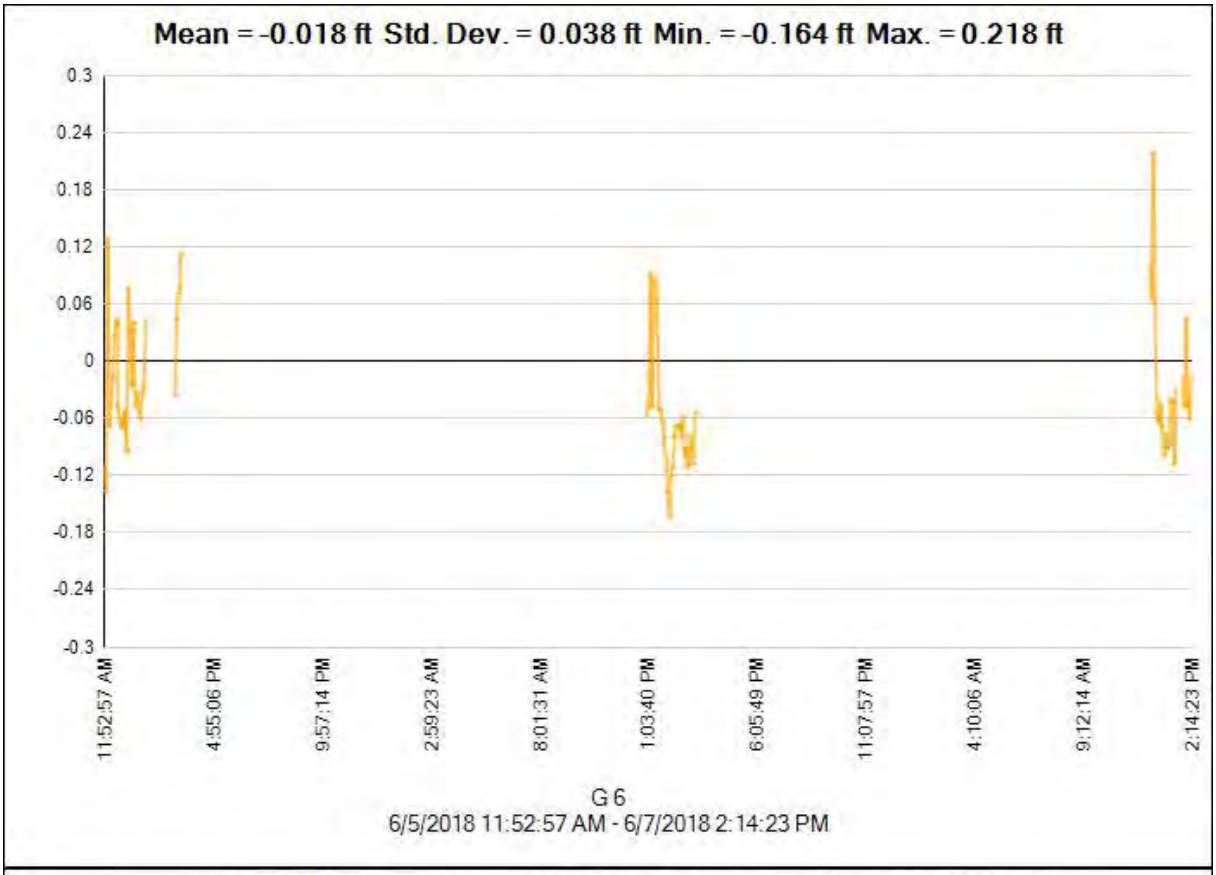
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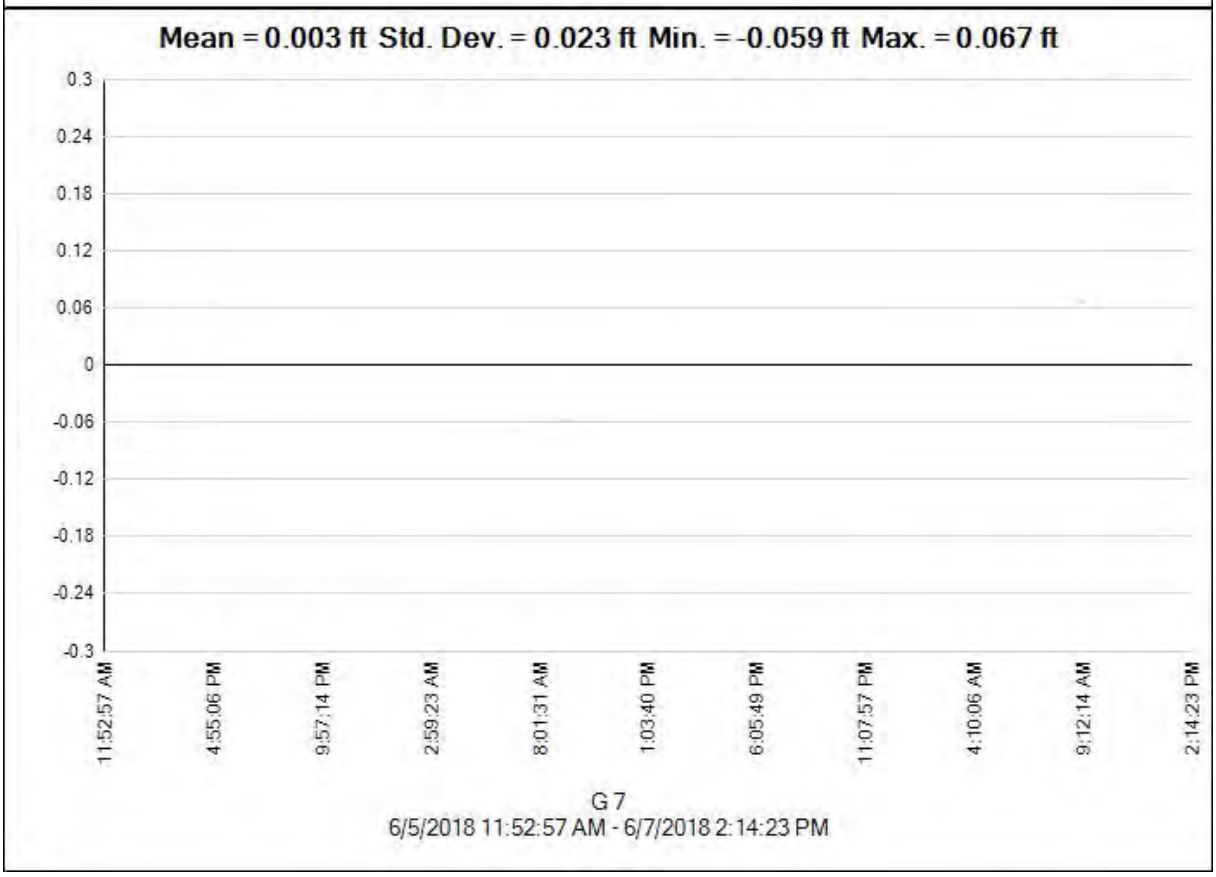
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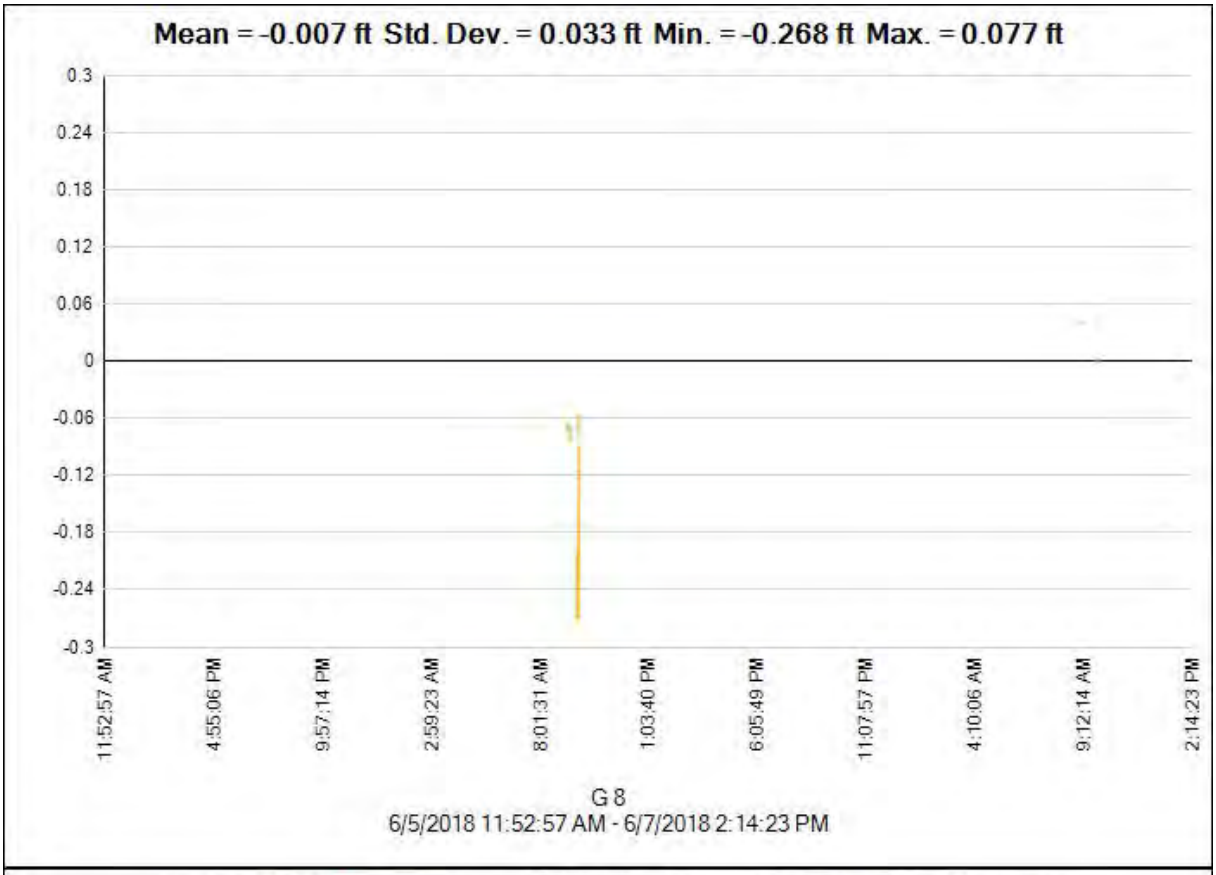
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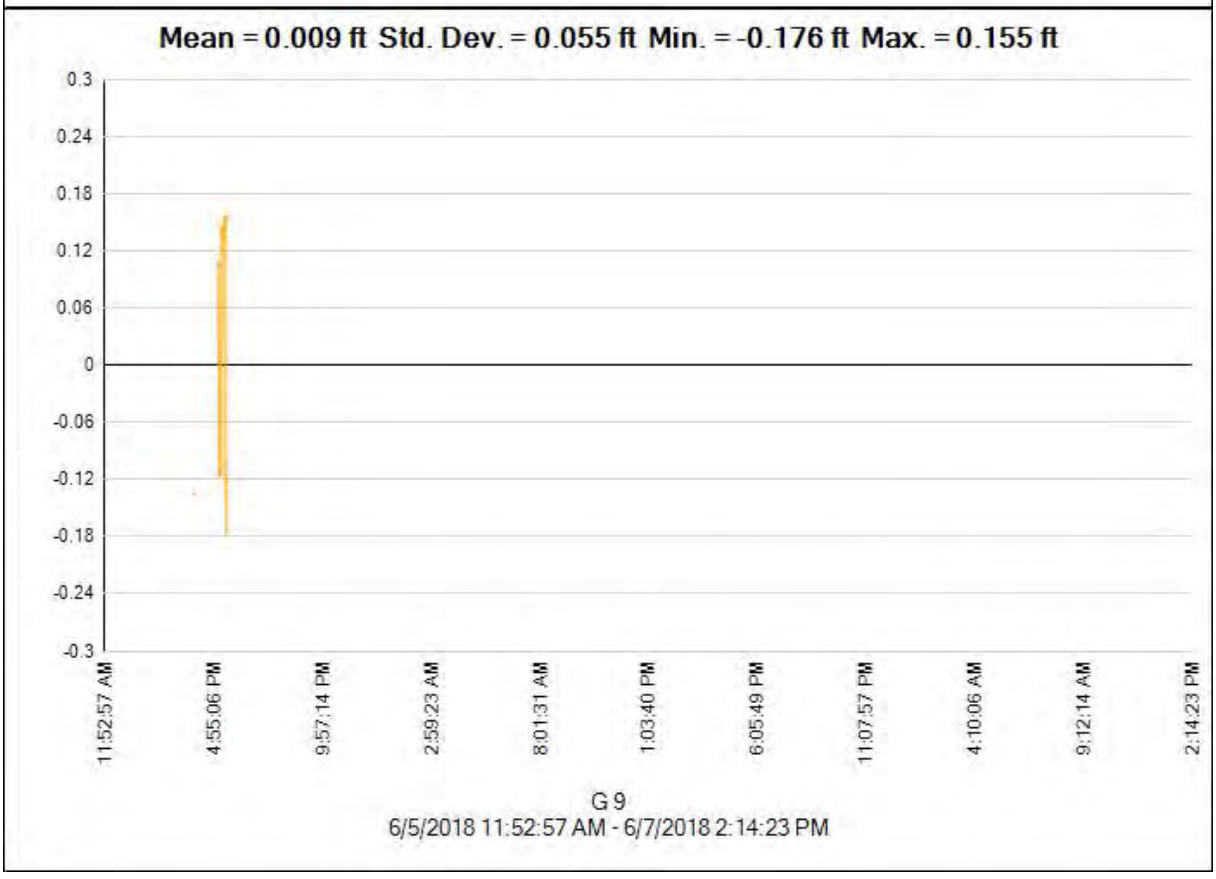
Mean = 0.009 ft Std. Dev. = 0.055 ft Min. = -0.176 ft Max. = 0.155 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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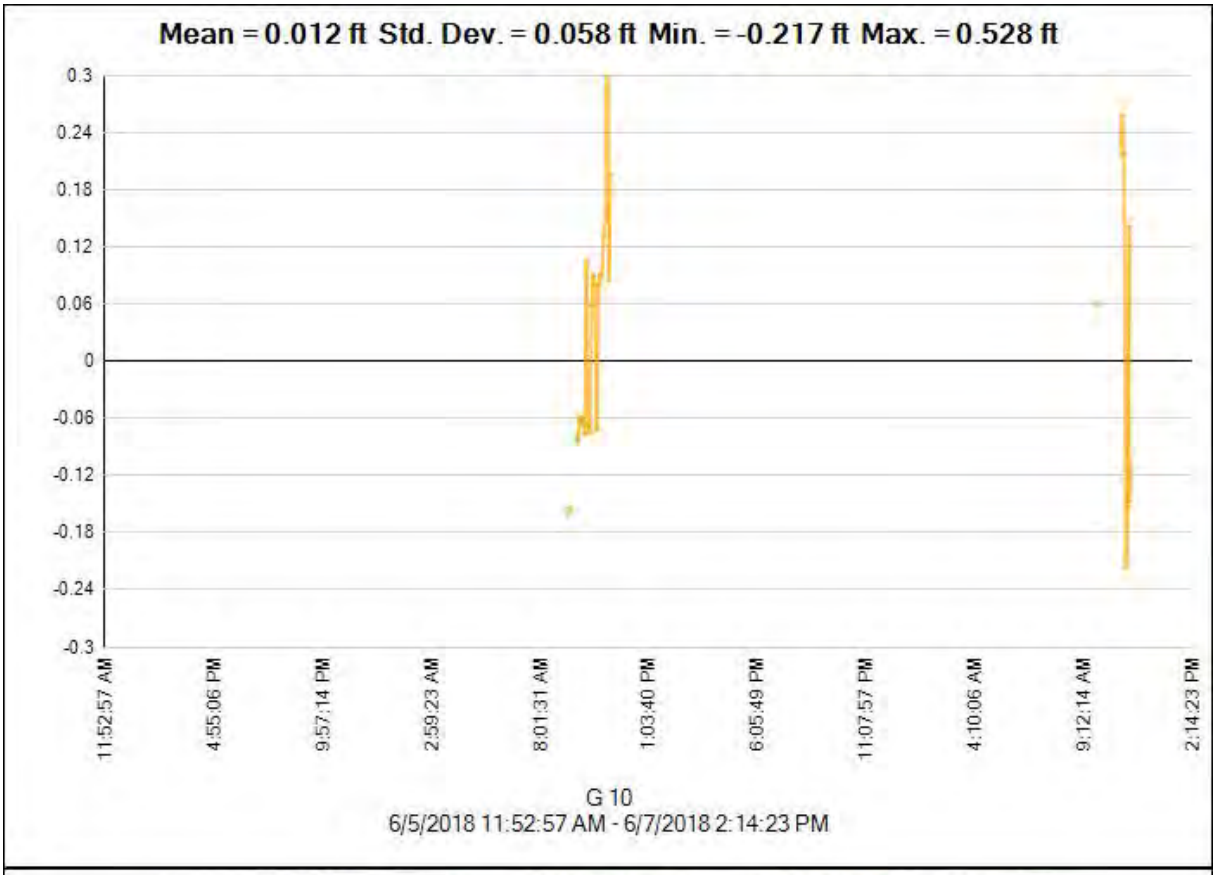
G 9
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.012 ft Std. Dev. = 0.058 ft Min. = -0.217 ft Max. = 0.528 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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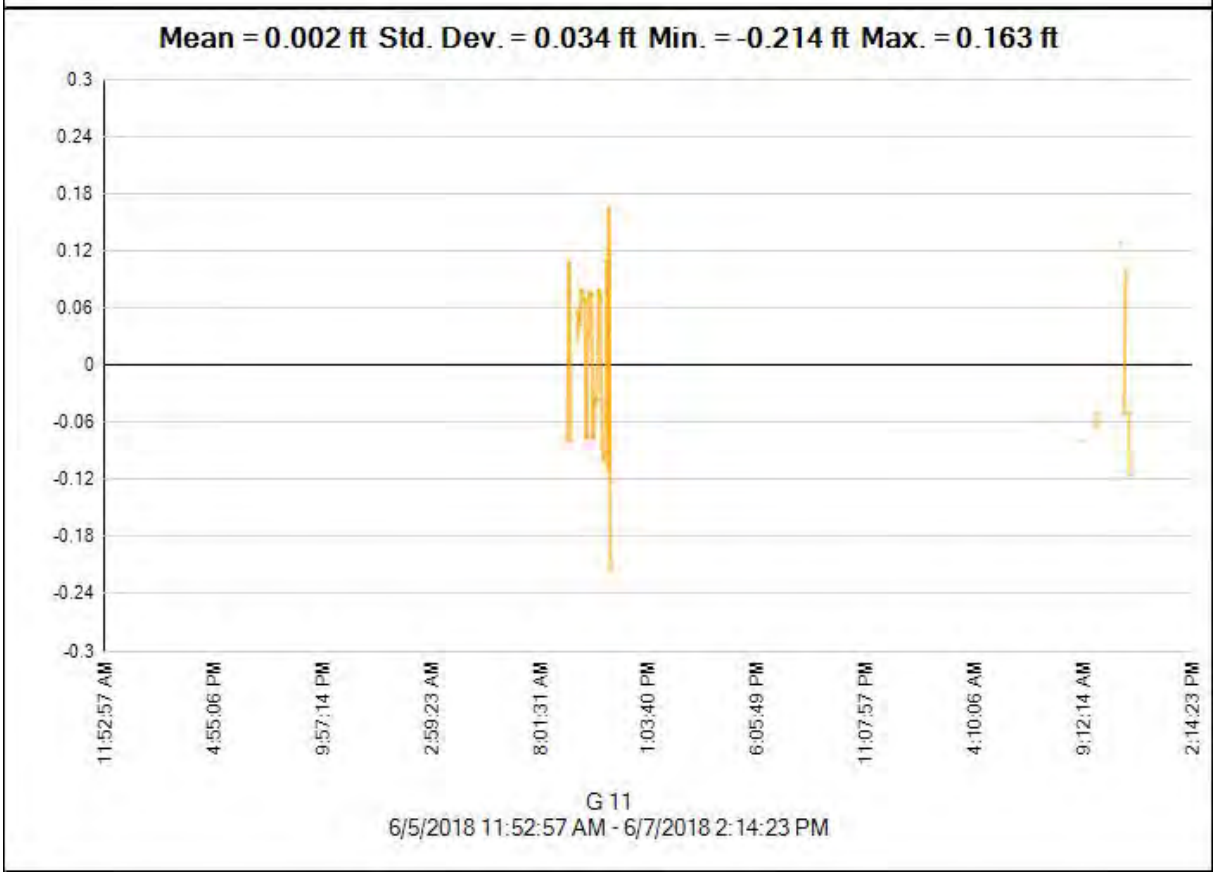
9:12:14 AM
2:14:23 PM
G 10
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.002 ft Std. Dev. = 0.034 ft Min. = -0.214 ft Max. = 0.163 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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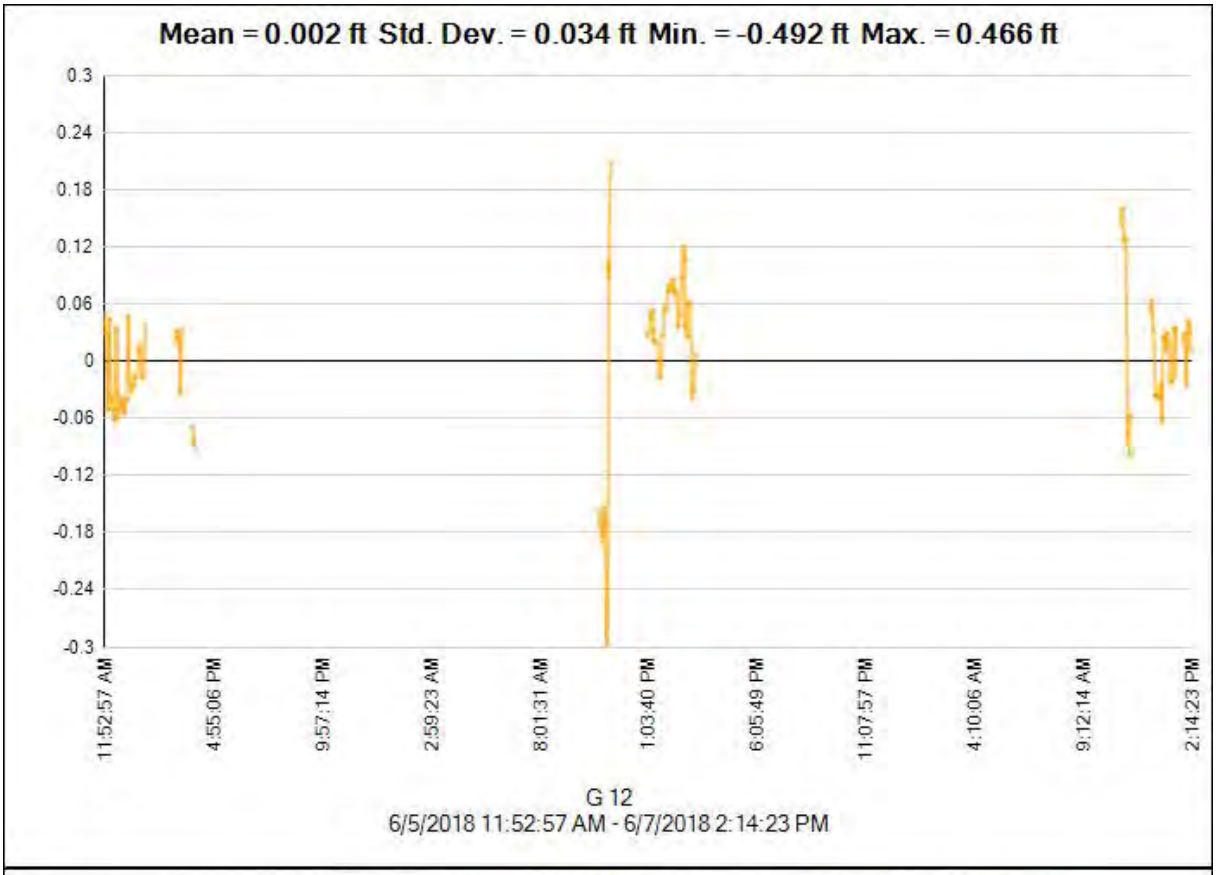
G 11
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.002 ft Std. Dev. = 0.034 ft Min. = -0.492 ft Max. = 0.466 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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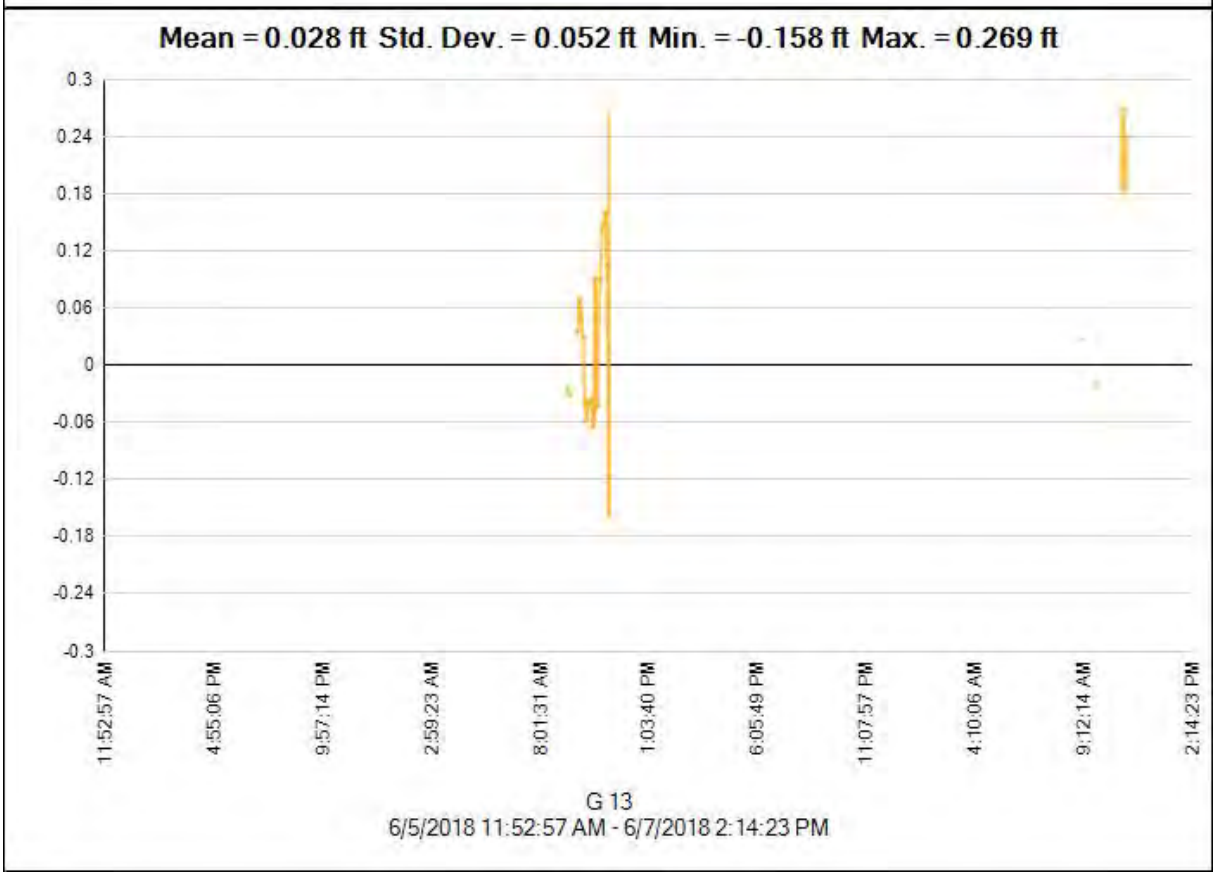
G 12
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.028 ft Std. Dev. = 0.052 ft Min. = -0.158 ft Max. = 0.269 ft
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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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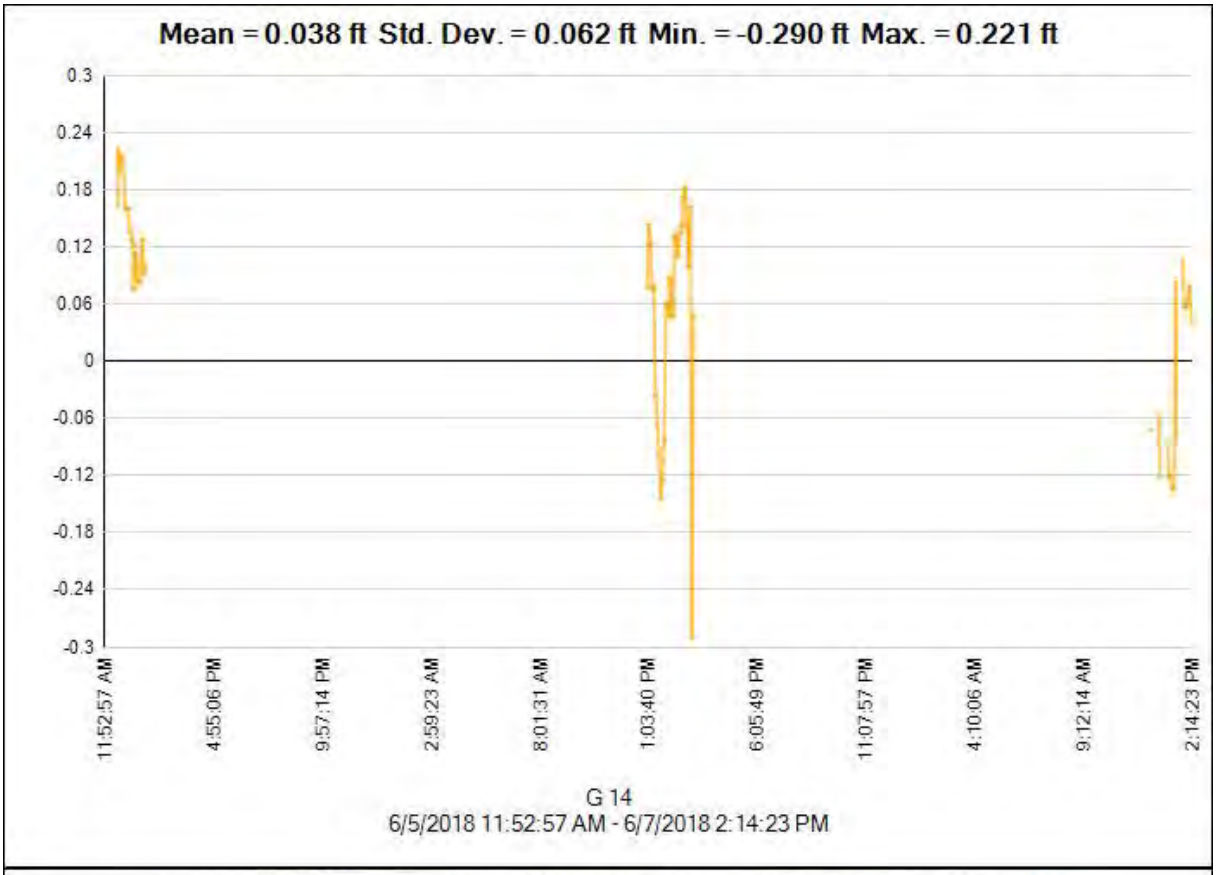
G 13
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.038 ft Std. Dev. = 0.062 ft Min. = -0.290 ft Max. = 0.221 ft
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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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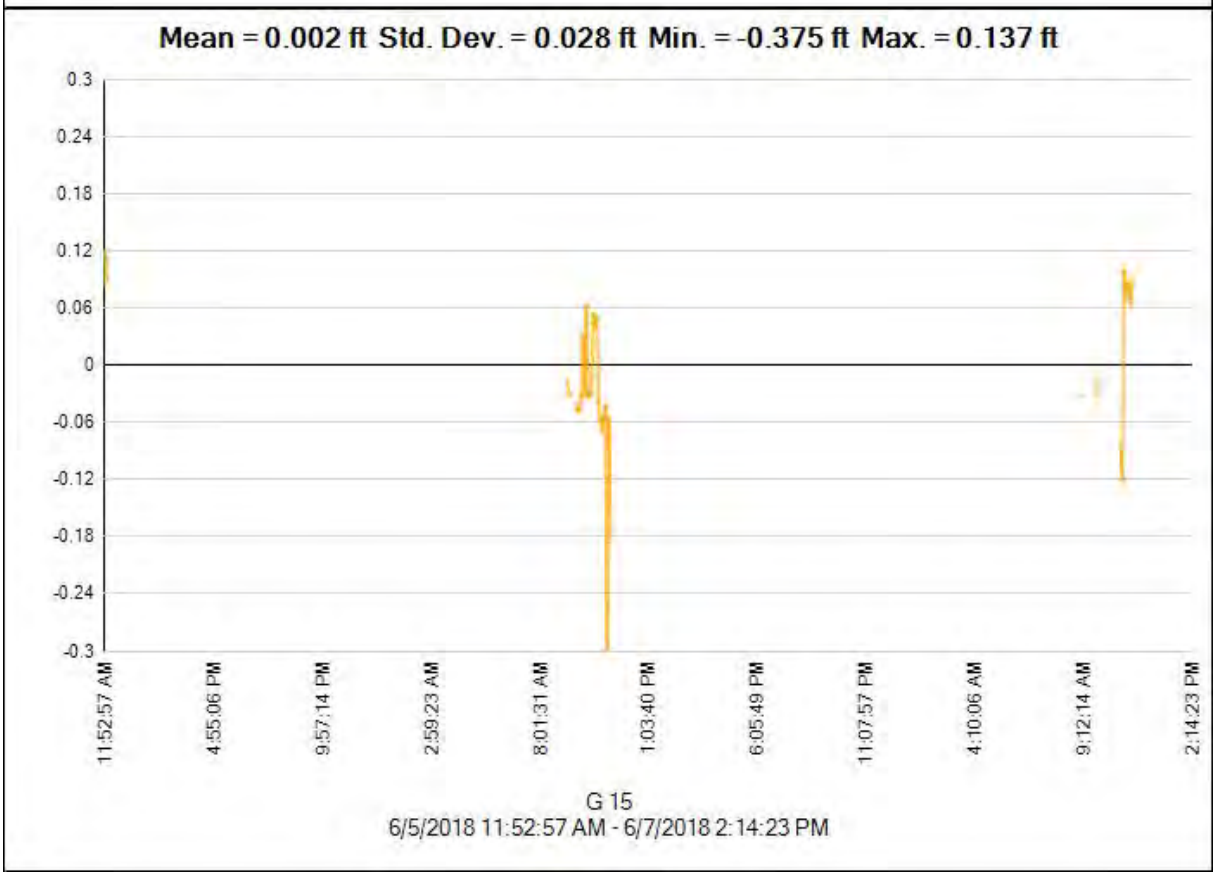
G 14
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.002 ft Std. Dev. = 0.028 ft Min. = -0.375 ft Max. = 0.137 ft
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0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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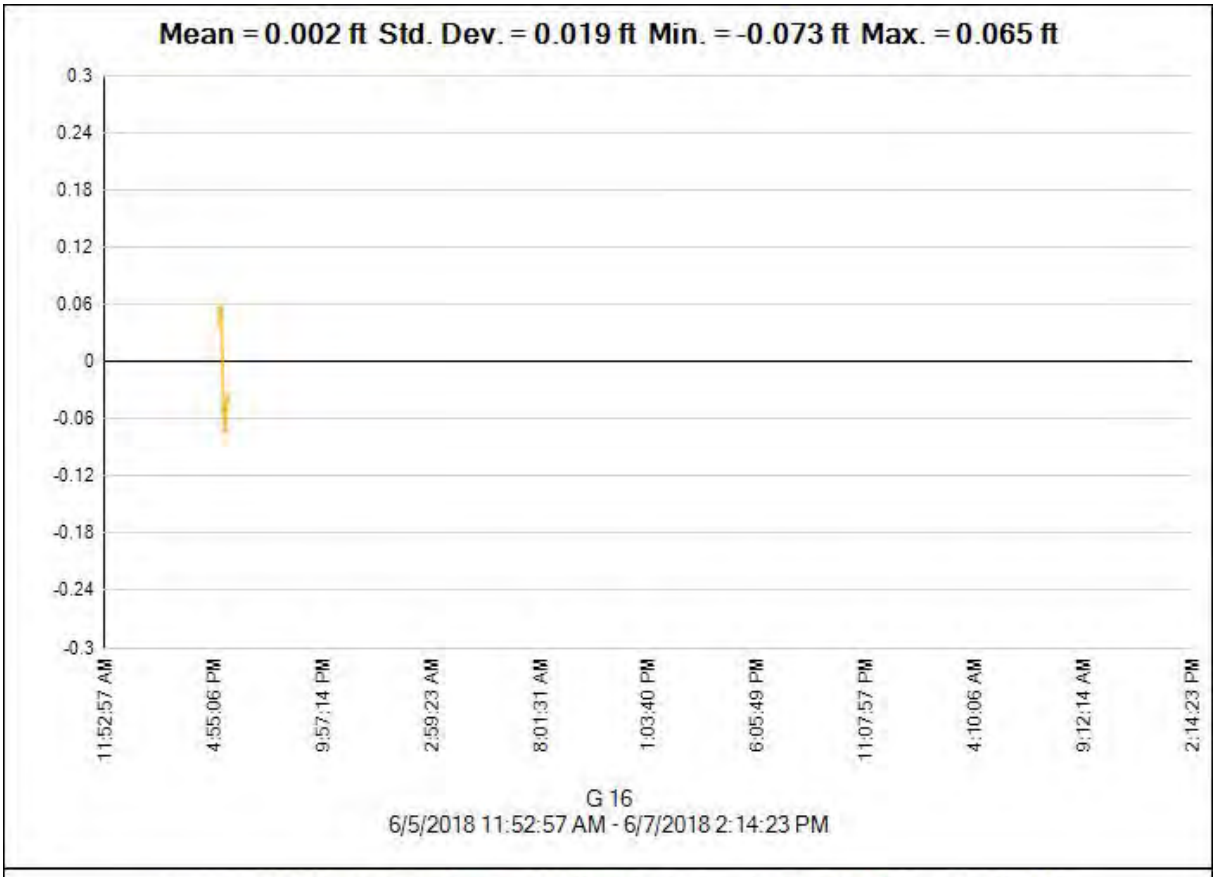
G 15
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.002 ft Std. Dev. = 0.019 ft Min. = -0.073 ft Max. = 0.065 ft
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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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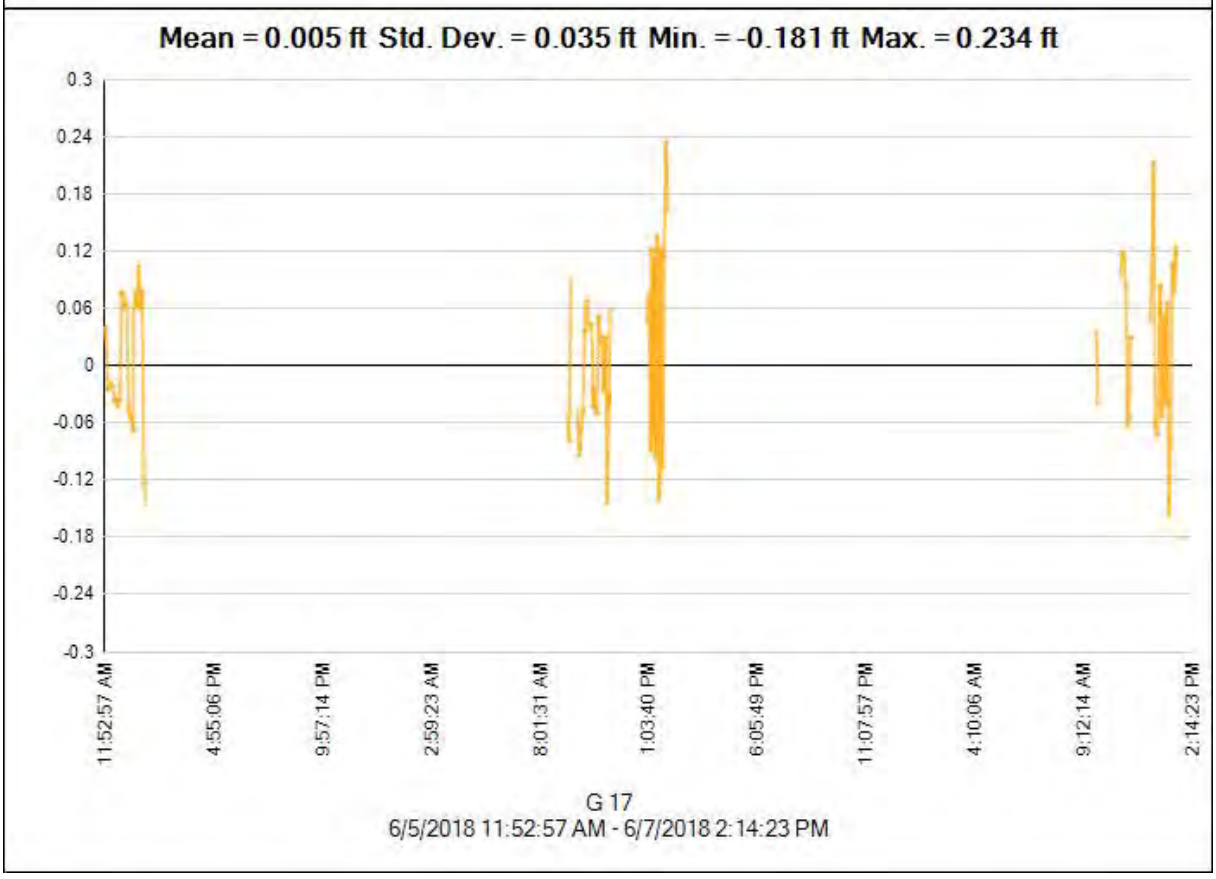
G 16
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.005 ft Std. Dev. = 0.035 ft Min. = -0.181 ft Max. = 0.234 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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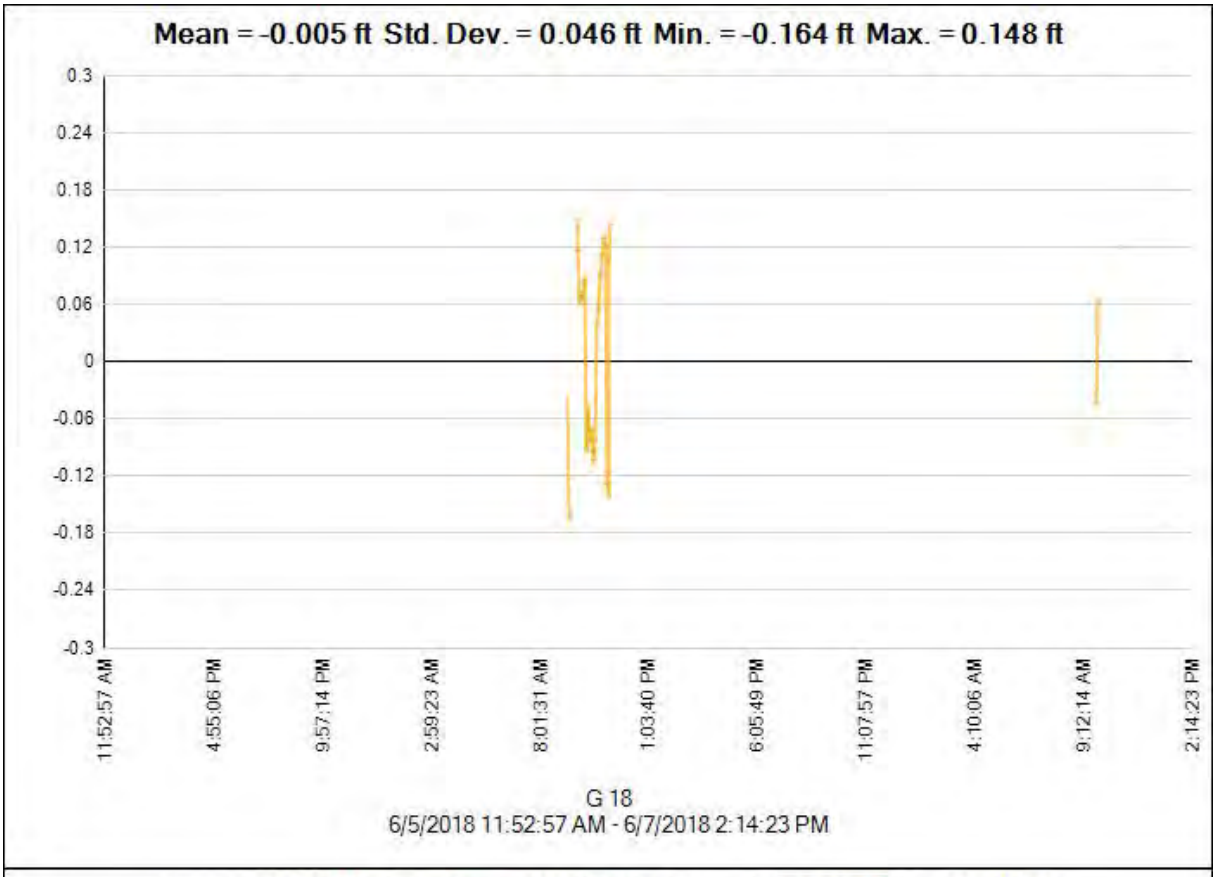
G 17
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = -0.005 ft Std. Dev. = 0.046 ft Min. = -0.164 ft Max. = 0.148 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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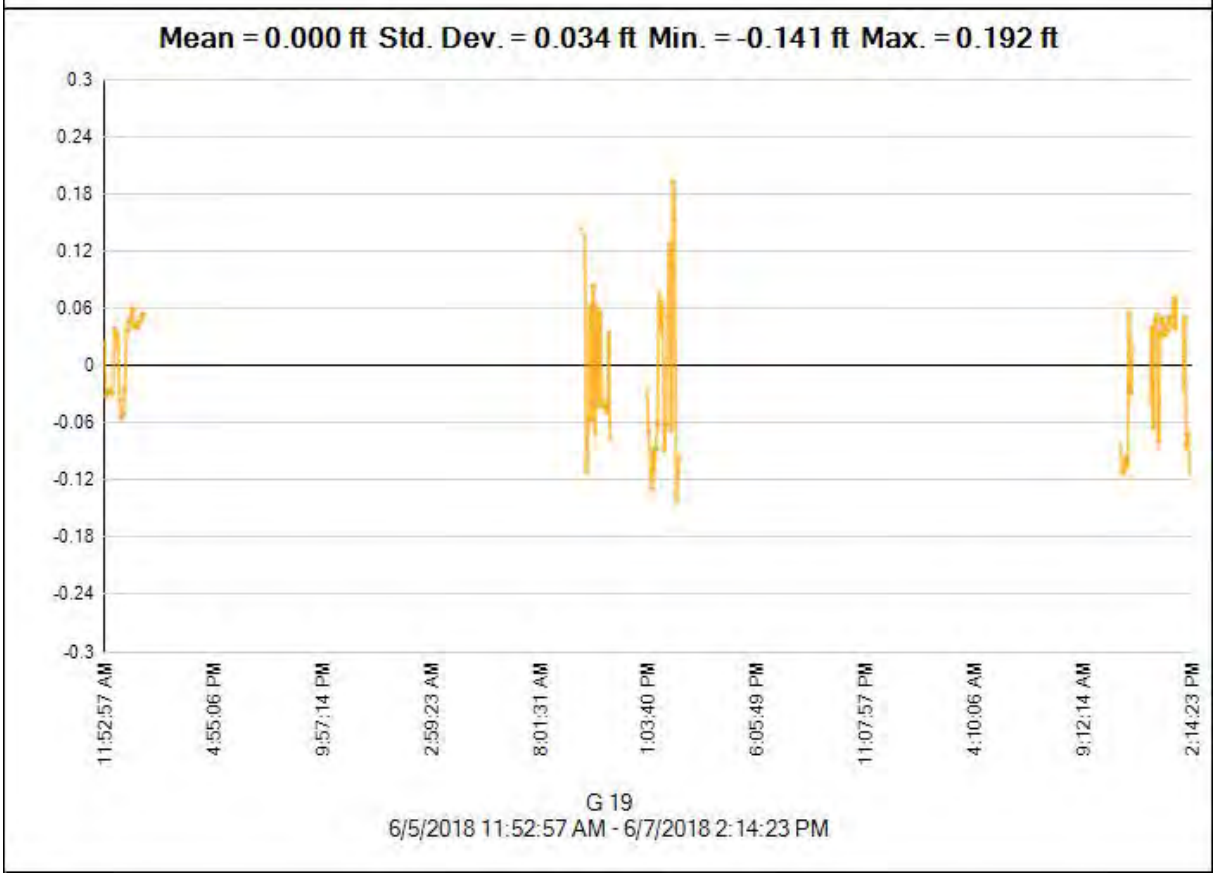
9:12:14 AM
2:14:23 PM
G 18
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.000 ft Std. Dev. = 0.034 ft Min. = -0.141 ft Max. = 0.192 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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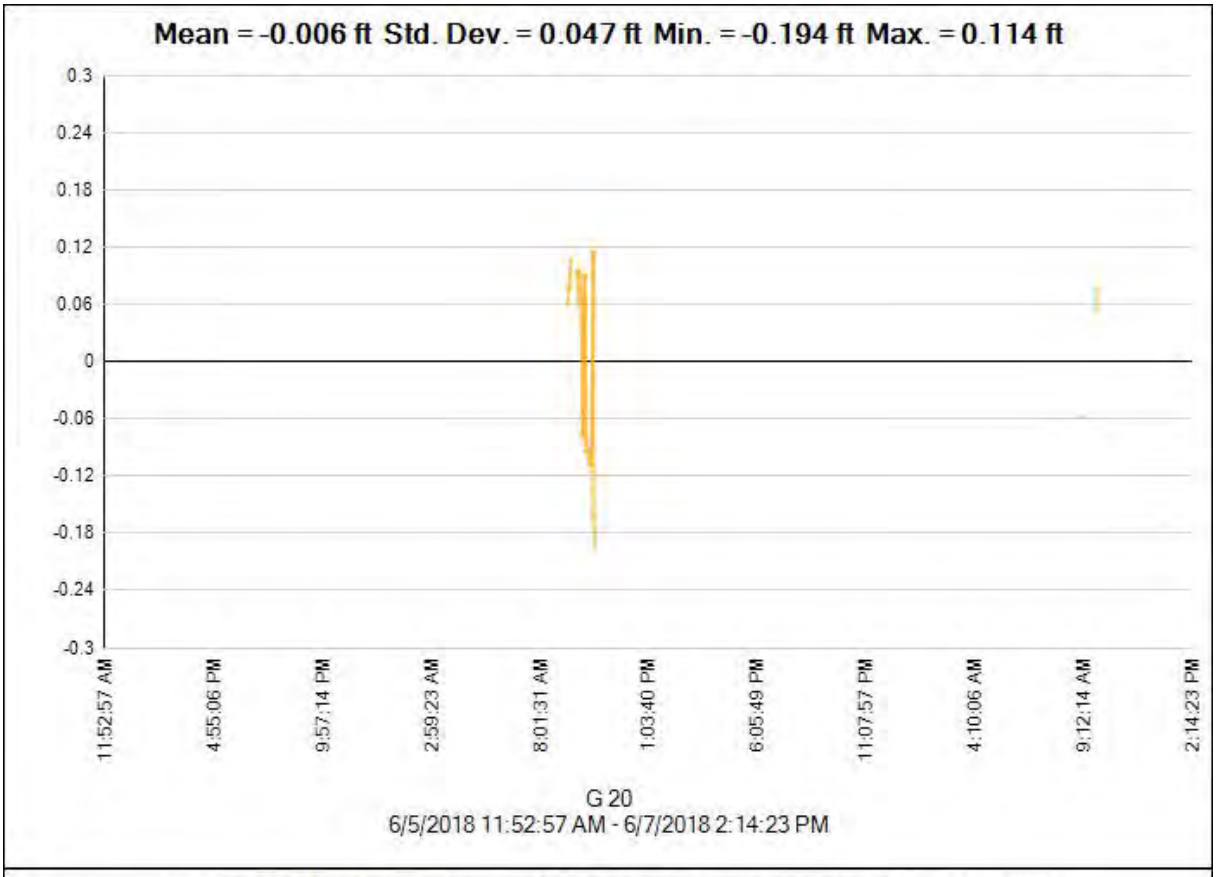
G 19
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = -0.006 ft Std. Dev. = 0.047 ft Min. = -0.194 ft Max. = 0.114 ft
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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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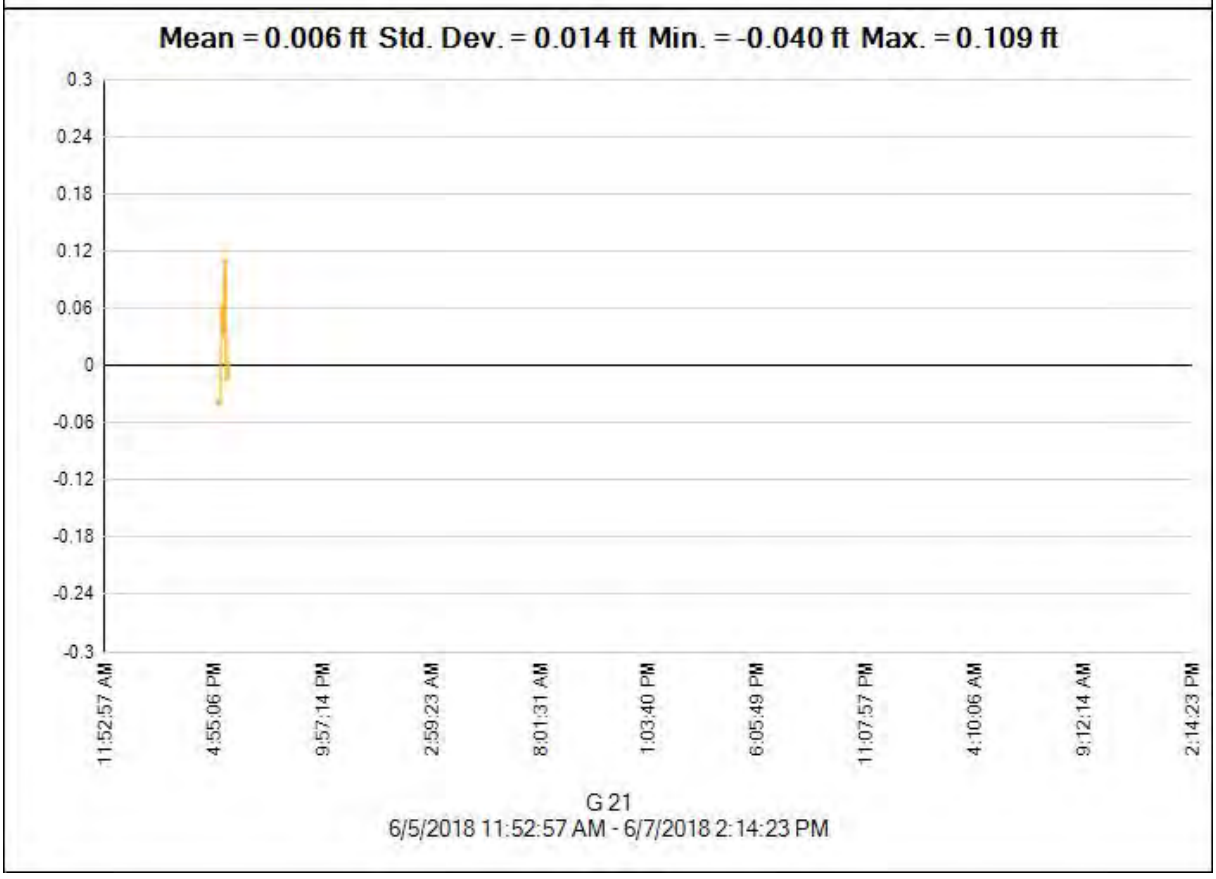
G 20
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.006 ft Std. Dev. = 0.014 ft Min. = -0.040 ft Max. = 0.109 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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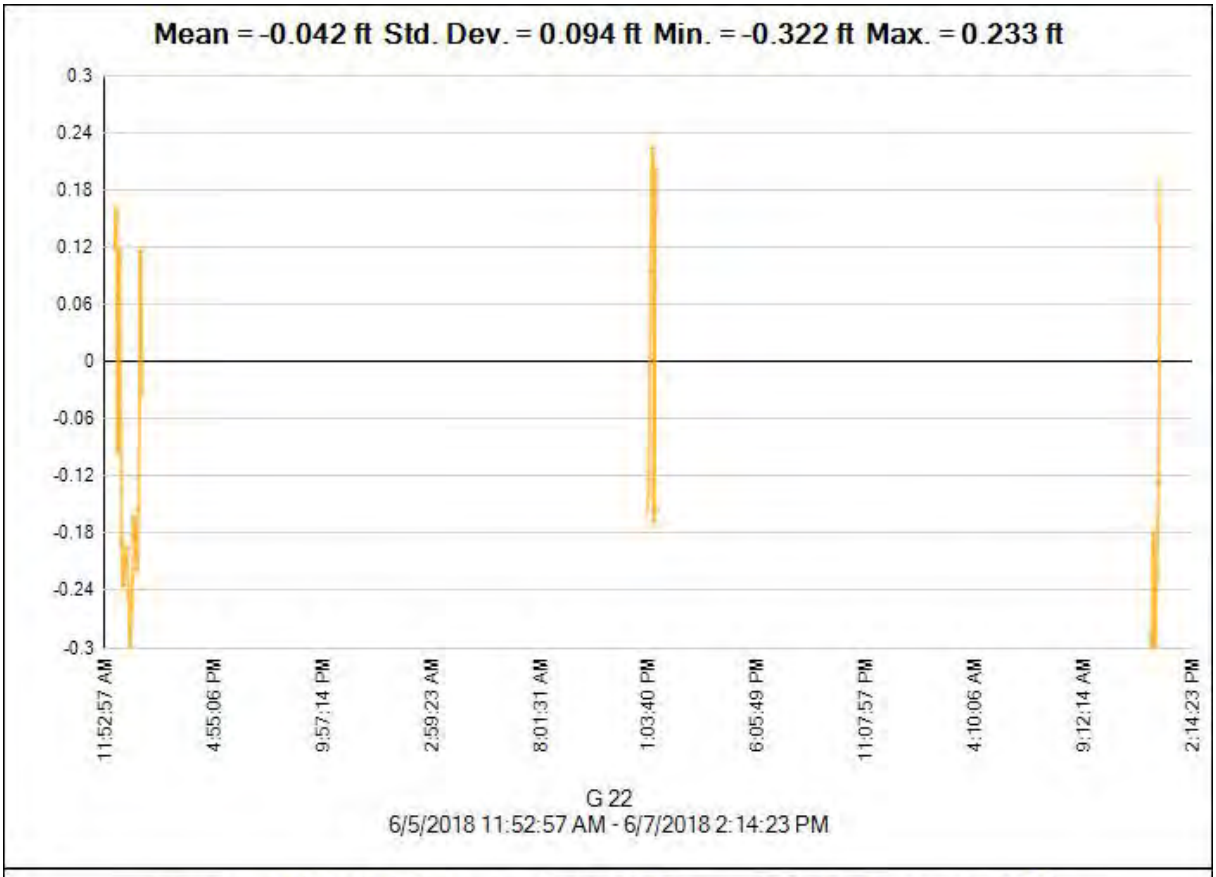
G 21
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = -0.042 ft Std. Dev. = 0.094 ft Min. = -0.322 ft Max. = 0.233 ft
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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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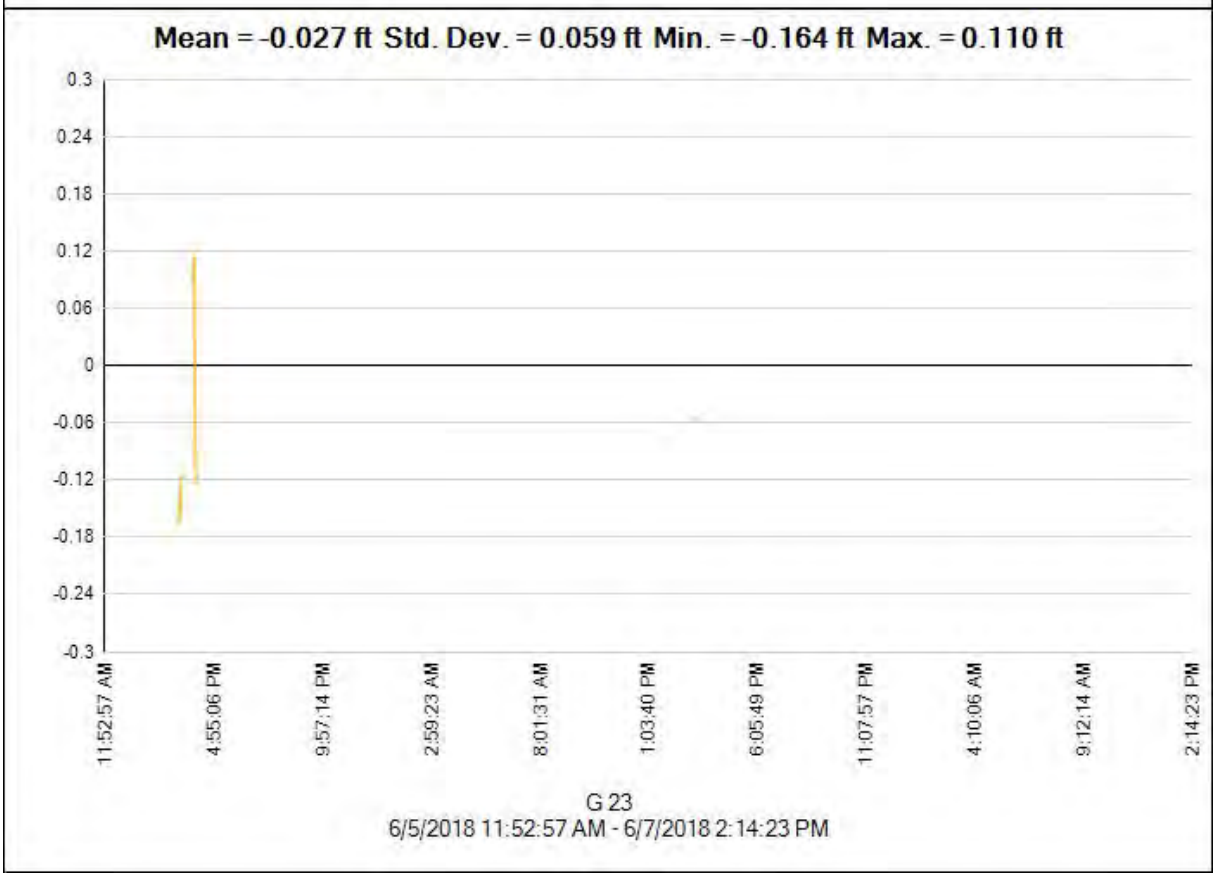
G 22
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = -0.027 ft Std. Dev. = 0.059 ft Min. = -0.164 ft Max. = 0.110 ft
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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
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8:01:31 AM
1:03:40 PM
6:05:49 PM
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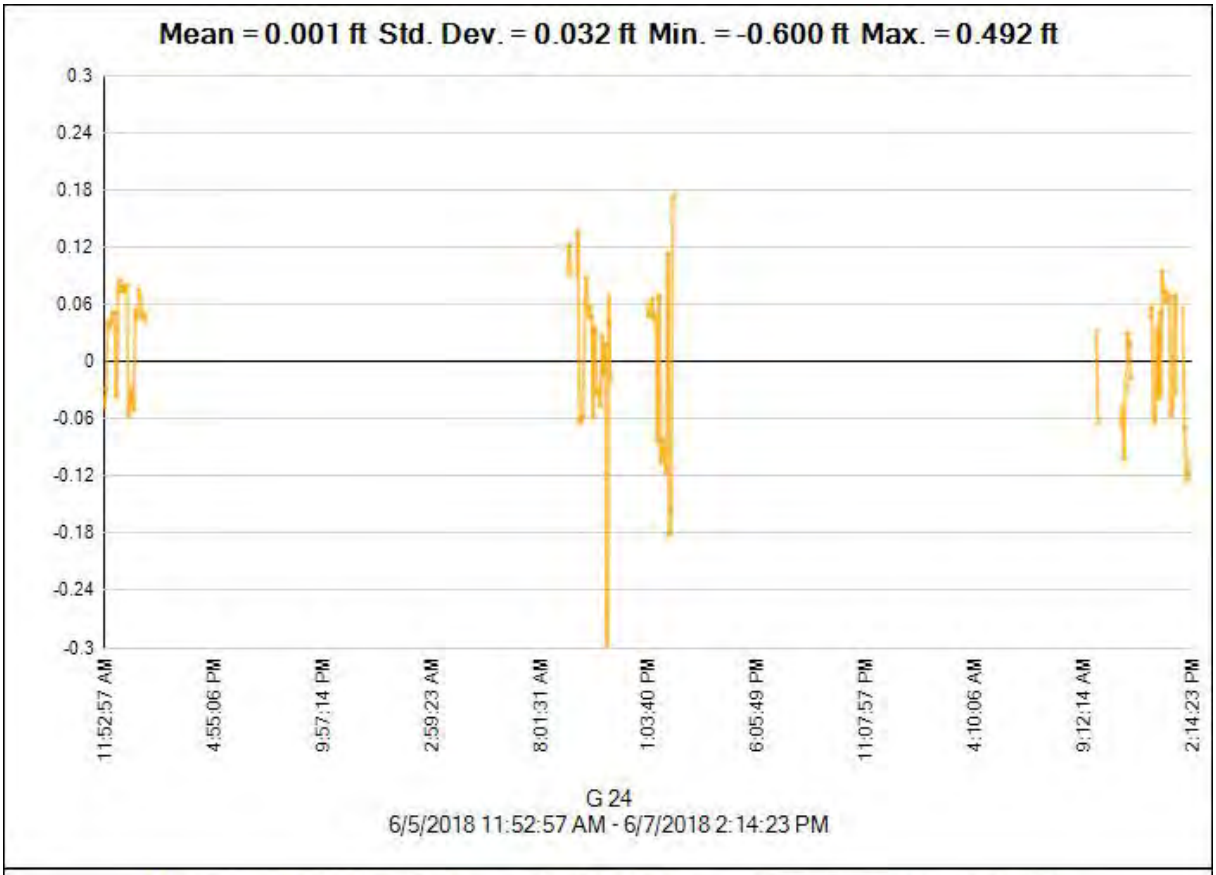
G 23
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.001 ft Std. Dev. = 0.032 ft Min. = -0.600 ft Max. = 0.492 ft
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0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
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8:01:31 AM
1:03:40 PM
6:05:49 PM
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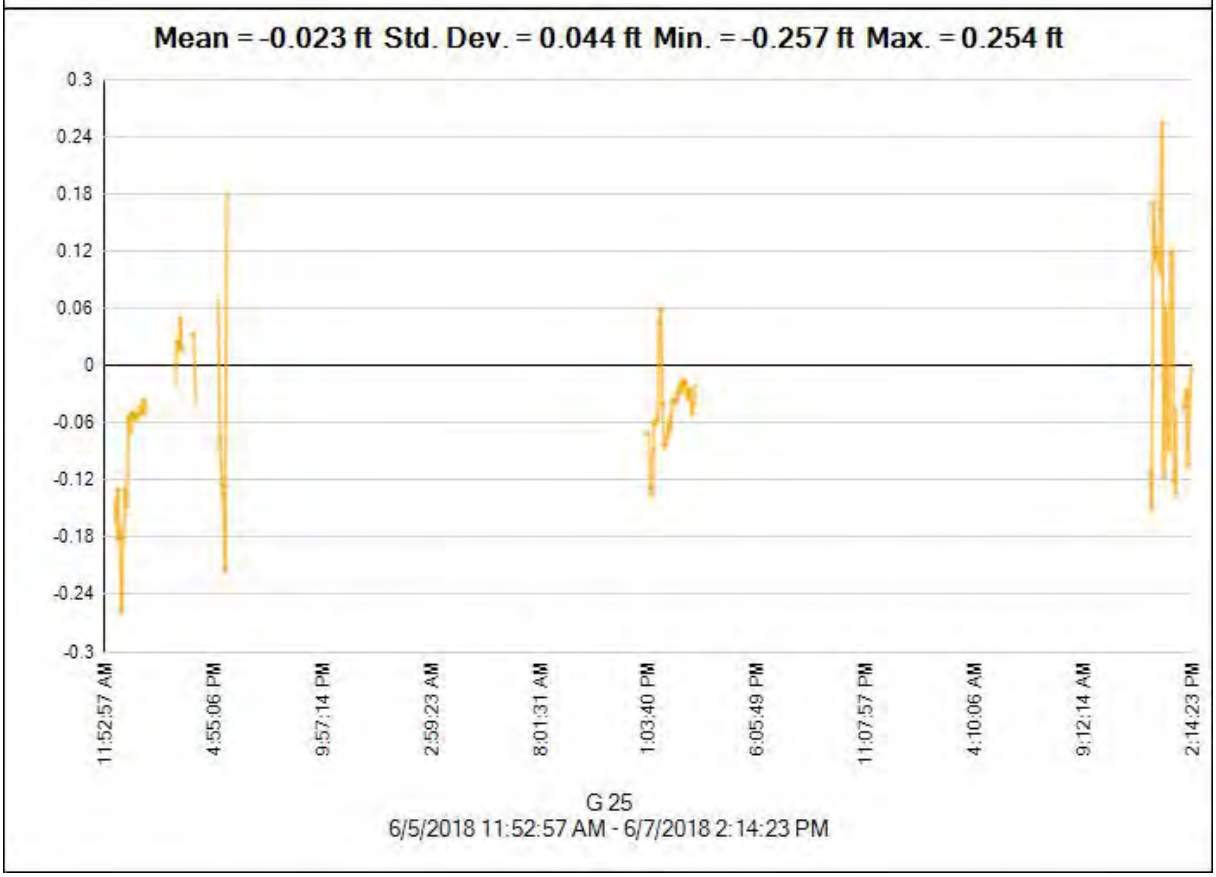
G 24
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = -0.023 ft Std. Dev. = 0.044 ft Min. = -0.257 ft Max. = 0.254 ft
0.3
0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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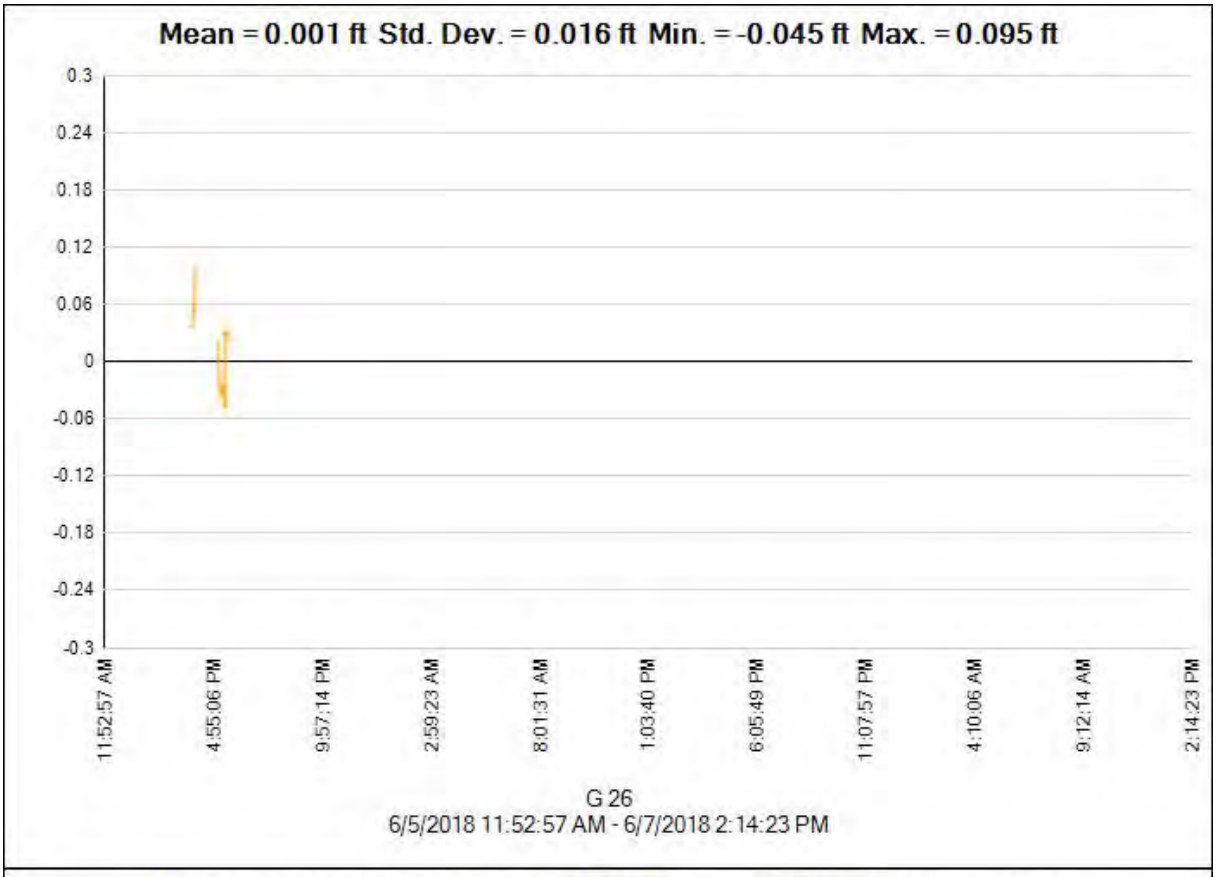
G 25
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.001 ft Std. Dev. = 0.016 ft Min. = -0.045 ft Max. = 0.095 ft
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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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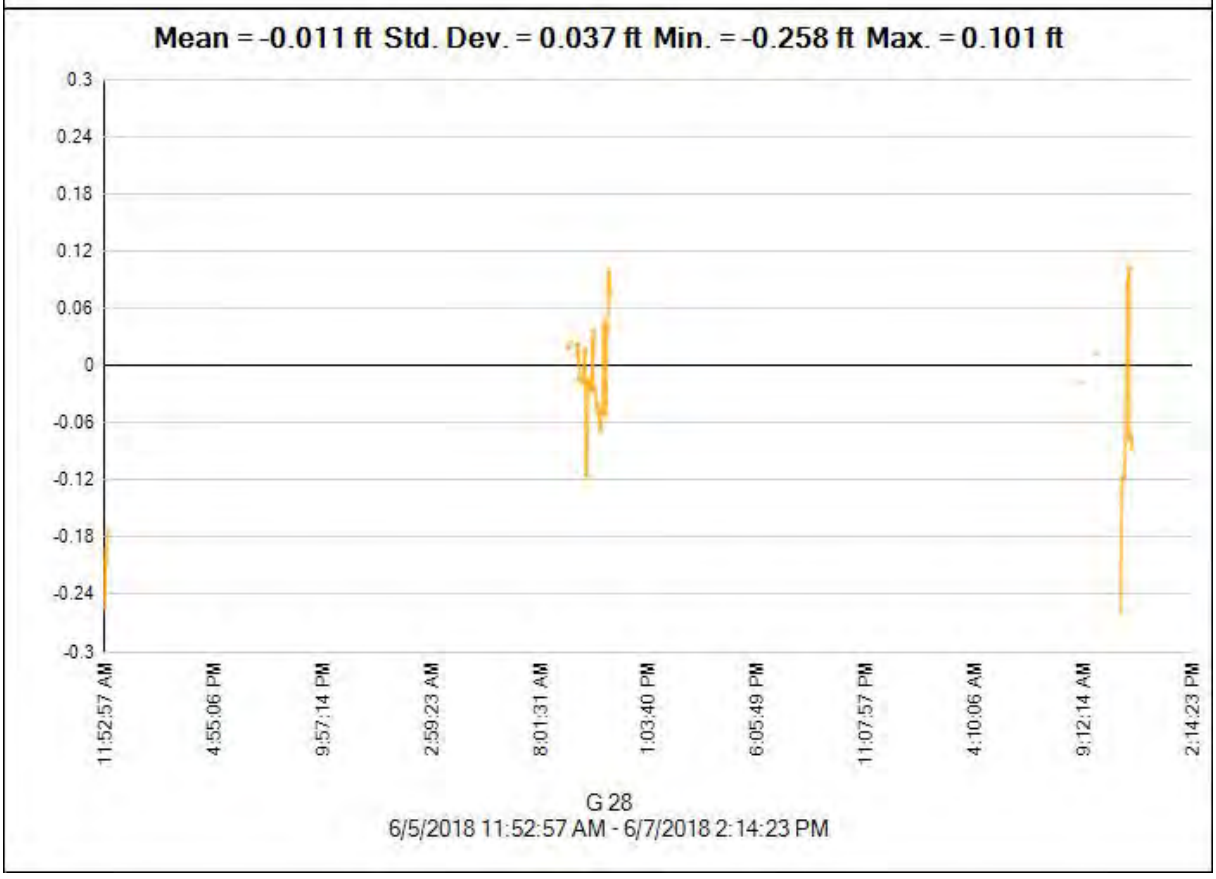
G 26
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM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0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
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4:55:06 PM
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1:03:40 PM
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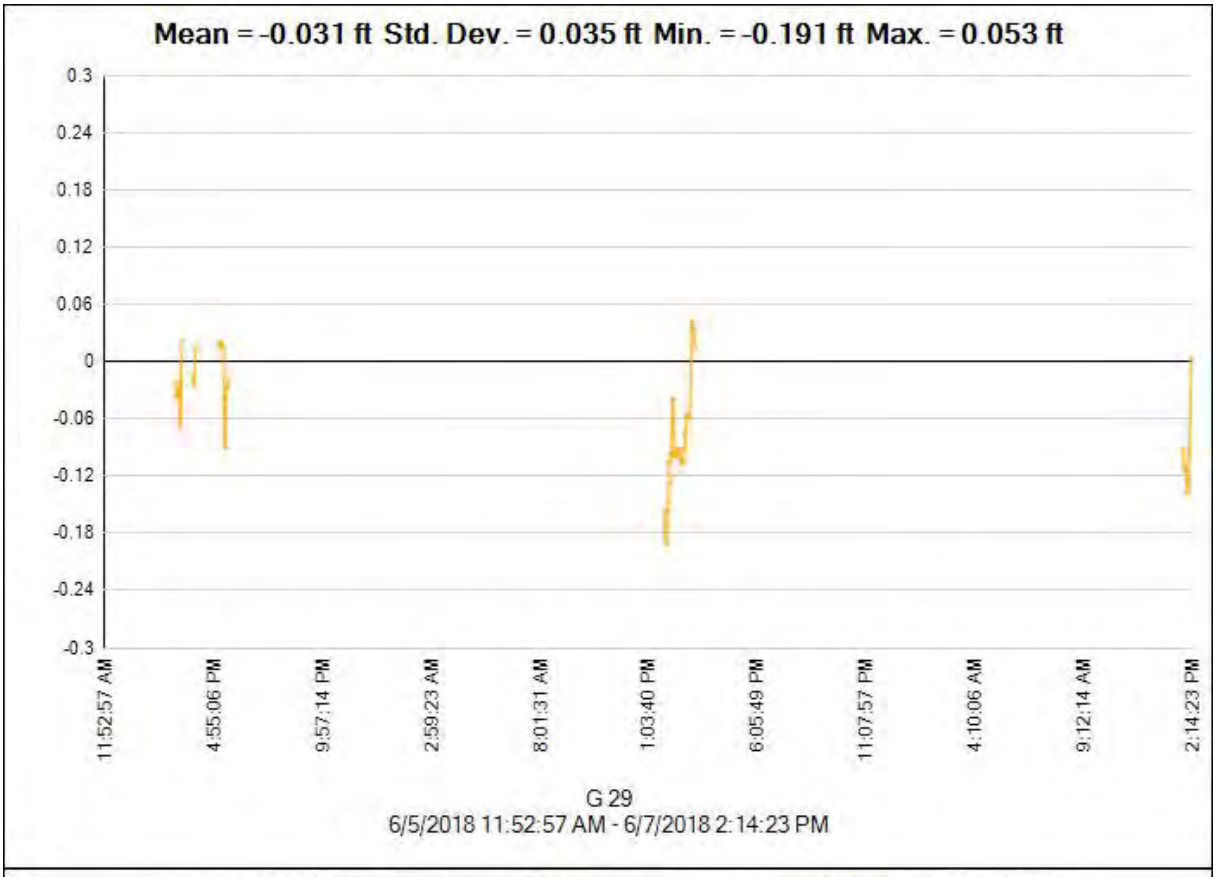
G 28
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = -0.031 ft Std. Dev. = 0.035 ft Min. = -0.191 ft Max. = 0.053 ft
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0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
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1:03:40 PM
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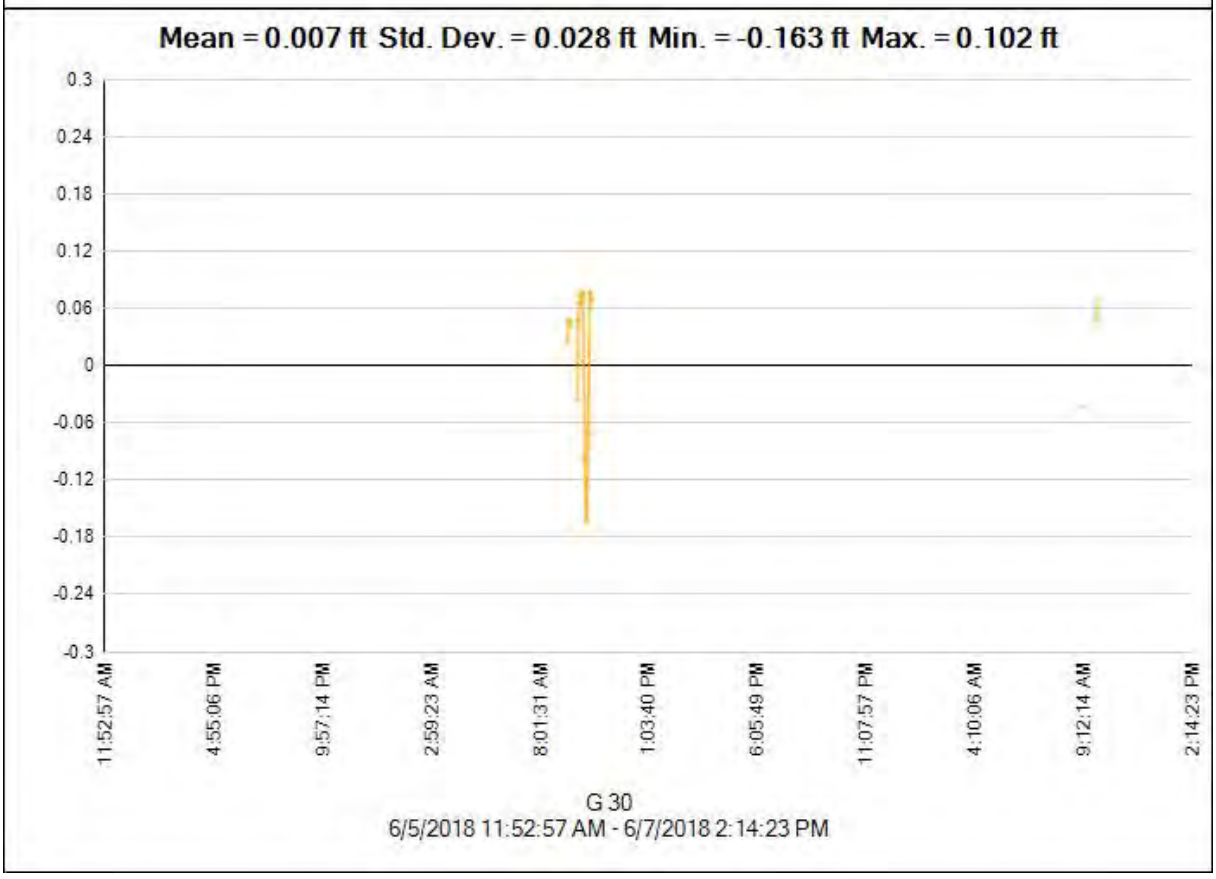
G 29
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.007 ft Std. Dev. = 0.028 ft Min. = -0.163 ft Max. = 0.102 ft
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0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
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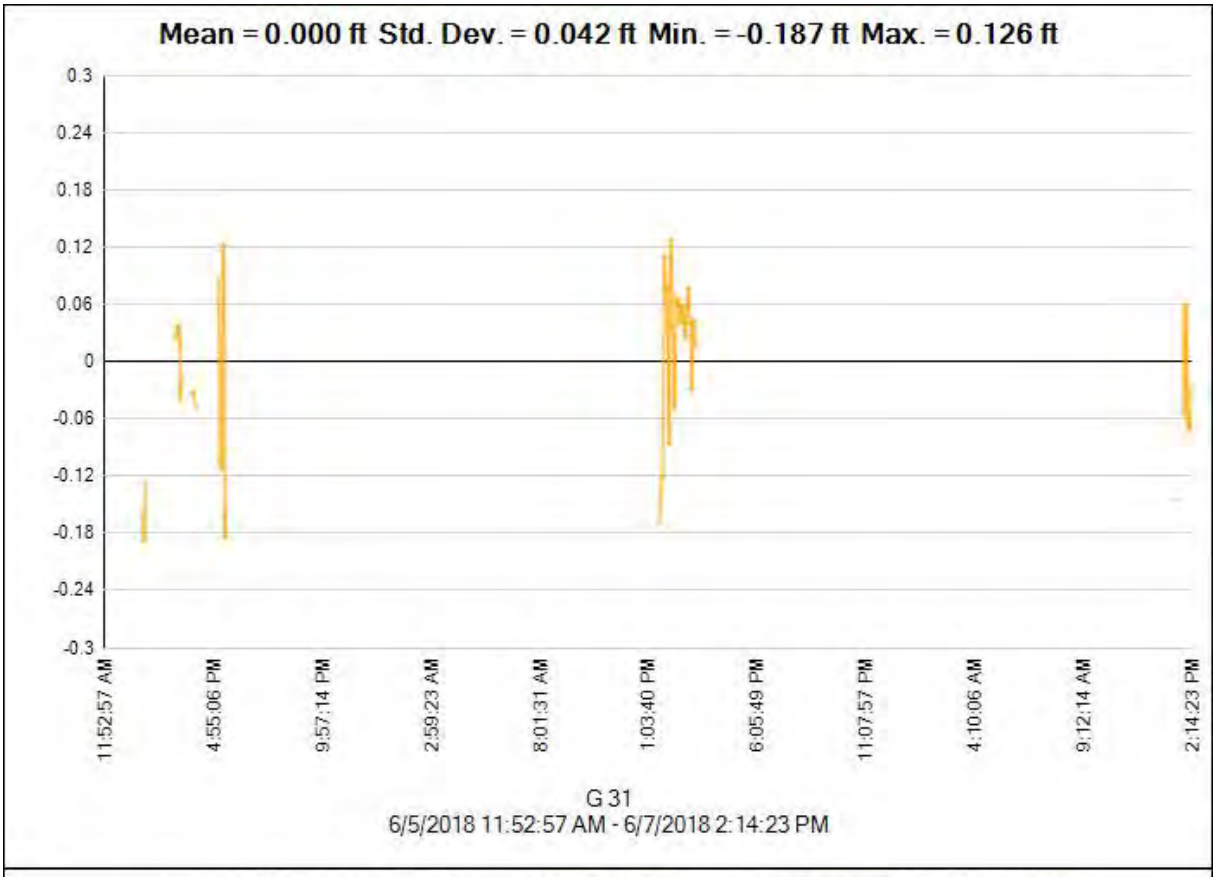
G 30
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM


Mean = 0.000 ft Std. Dev. = 0.042 ft Min. = -0.187 ft Max. = 0.126 ft
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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
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4:55:06 PM
9:57:14 PM
2:59:23 AM
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1:03:40 PM
6:05:49 PM
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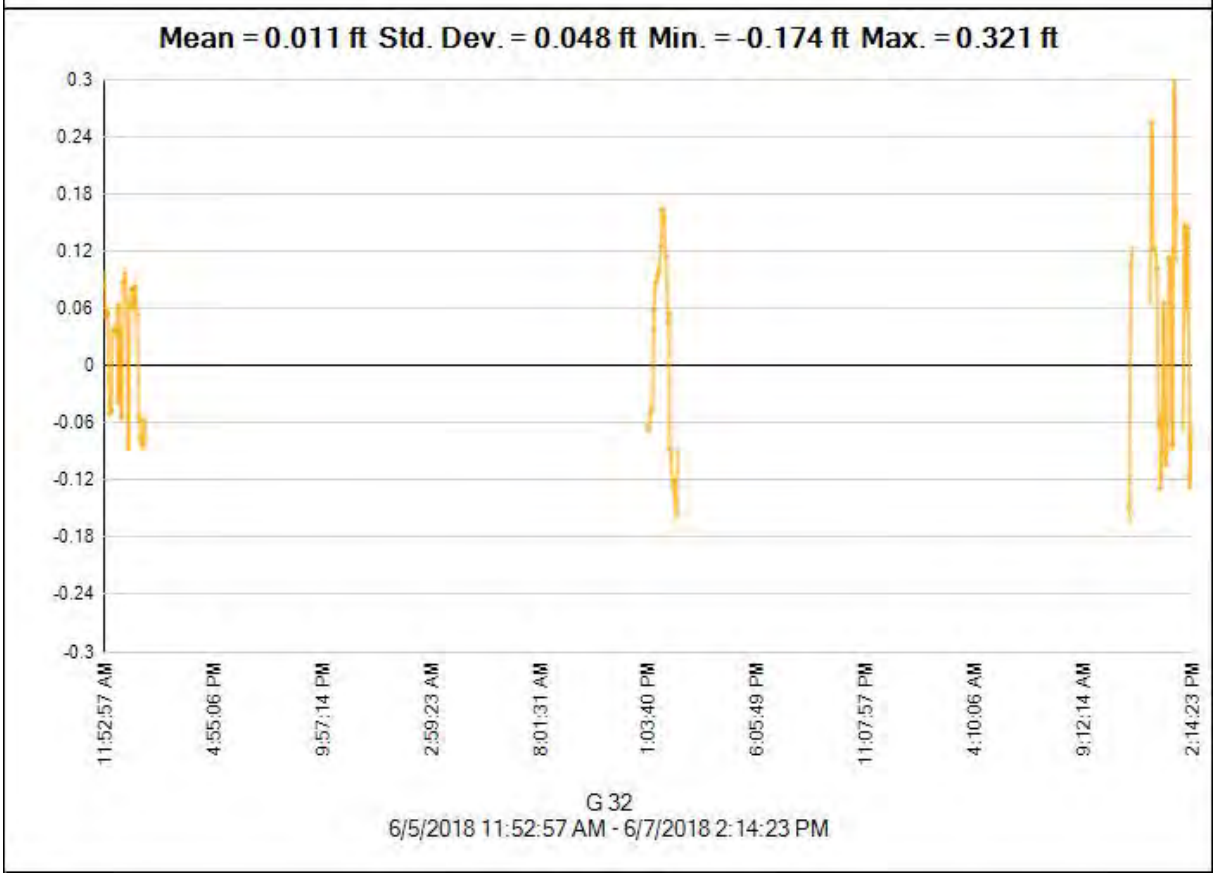
G 31
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM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0.24
0.18
0.12
0.06
0
-0.06
-0.12
-0.18
-0.24
-0.3
11:52:57 AM
4:55:06 PM
9:57:14 PM
2:59:23 AM
8:01:31 AM
1:03:40 PM
6:05:49 PM
11:07:57 PM
4:10:06 AM
9:12:14 AM
2:14:23 PM
G 32
6/5/2018 11:52:57 AM - 6/7/2018 2:14:23 PM

Processing style

Elevation mask:	10°00'00.0"
Auto start processing:	Yes
Start automatic ID numbering:	AUTO0001
Continuous vectors:	No
Generate residuals:	Yes
Antenna model:	Automatic
Ephemeris type:	Automatic
Frequency:	Multiple Frequencies
Processing Interval:	Automatic
Force float:	No
GIS processing type:	Automatic Carrier and Code Processing

Acceptance Criteria

Vector Component	Flag	Fail
Horizontal Precision >	0.164 ft + 1.000 ppm	0.328 ft + 1.000 ppm
Vertical Precision >	0.328 ft + 1.000 ppm	0.656 ft + 1.000 ppm

6/19/2018 9:03:51 AM	C:\Users\robbo\Desktop\New folder (2)\Baseline processing SLR.vce	Trimble Business Center

Project file data		Coordinate System	
Name:	C:\Users\robbo\Desktop\New folder (2)\Baseline processing SLR.vce	Name:	United States/State Plane 1983
Size:	595 KB	Datum:	NAD 1983 (Alaska)
Modified:	6/19/2018 9:01:28 AM (UTC:-8)	Zone:	Alaska Zone 3 5003
Time zone:	Alaskan Standard Time	Geoid:	GEOID12B (Alaska)
Reference number:		Vertical datum:	
Description:		Calibrated site:	
Comment 1:			
Comment 2:			
Comment 3:			

Point List

ID	Northing (US survey foot)	Easting (US survey foot)	Elevation (US survey foot)	Feature Code
1	3950543.284	1346766.562	430.947	
2	3950223.850	1346511.664	429.548	
3	3950224.215	1346363.637	425.146	
4	3950012.656	1346694.934	430.331	
5	3949867.562	1346842.004	424.516	
6.1	3951043.345	1347196.310	433.394	
6.2	3951043.343	1347196.307	433.379	
6.3	3951043.357	1347196.307	433.386	
6.4	3951043.358	1347196.286	433.352	
6.5	3951043.340	1347196.279	433.372	
6.6	3951043.435	1347196.290	433.437	
6.7	3951042.467	1347197.596	433.647	
6.8	3951041.138	1347199.469	433.658	
6.9	3951039.392	1347201.683	433.749	
6.10	3951037.640	1347204.314	433.663	
6.11	3951035.751	1347207.138	433.787	
6.12	3951033.382	1347210.056	433.570	
6.13	3951031.169	1347212.442	433.875	
6.14	3951029.154	1347215.163	433.715	
6.15	3951026.975	1347218.051	433.748	
6.16	3951024.775	1347221.002	433.742	
6.17	3951022.530	1347223.578	433.629	
6.18	3951020.041	1347226.418	433.726	
6.19	3951017.547	1347229.502	433.675	
6.20	3951015.164	1347232.684	433.605	

6.21	3951012.739	1347235.952	433.708	
6.22	3951010.192	1347239.058	433.677	
6.23	3951007.853	1347242.231	433.566	
6.24	3951005.512	1347245.122	433.677	
6.25	3951003.104	1347247.897	433.726	
6.26	3951000.425	1347250.193	433.902	
6.27	3950998.035	1347251.661	433.918	
6.28	3950996.064	1347254.976	433.739	
6.29	3950994.479	1347258.574	433.921	
6.30	3950992.428	1347262.222	433.941	
6.31	3950989.726	1347265.510	433.866	
6.32	3950987.063	1347268.636	433.882	
6.33	3950984.907	1347271.971	433.881	
6.34	3950982.749	1347275.338	433.854	
6.35	3950979.907	1347278.536	433.765	
6.36	3950977.405	1347281.730	433.915	
6.37	3950974.987	1347285.248	433.780	
6.38	3950972.560	1347288.940	434.000	
6.39	3950970.520	1347291.821	434.094	
6.40	3950968.215	1347294.778	434.119	
6.41	3950965.871	1347298.025	433.984	
6.42	3950963.044	1347301.420	434.024	
6.43	3950960.130	1347304.693	434.003	
6.44	3950957.435	1347308.330	434.119	
6.45	3950954.930	1347311.641	434.124	
6.46	3950952.577	1347315.144	434.170	
6.47	3950950.271	1347318.768	434.142	
6.48	3950947.771	1347322.113	433.980	
6.49	3950945.273	1347325.742	433.985	
6.50	3950942.472	1347329.178	434.092	
6.51	3950939.627	1347332.678	434.009	
6.52	3950937.100	1347336.243	433.893	
6.53	3950934.839	1347339.609	433.907	
6.54	3950932.118	1347342.562	433.923	
6.55	3950929.938	1347345.882	433.645	
6.56	3950927.681	1347348.828	433.664	
6.57	3950925.633	1347352.366	433.530	
6.58	3950923.744	1347354.863	433.277	
6.59	3950923.179	1347355.953	433.224	

6.60	3950923.154	1347355.967	433.208	
6.61	3950923.147	1347356.037	433.202	
6.62	3950923.075	1347356.072	433.179	
6.63	3950923.101	1347356.075	433.214	
6.64	3950923.036	1347355.997	433.239	
6.65	3950921.799	1347354.415	433.485	
6.66	3950918.851	1347351.825	433.621	
6.67	3950915.856	1347349.382	433.695	
6.68	3950912.562	1347346.544	433.770	
6.69	3950909.271	1347343.792	433.772	
6.70	3950905.918	1347340.834	433.859	
6.71	3950902.414	1347338.046	434.098	
6.72	3950899.025	1347334.706	434.176	
6.73	3950895.460	1347331.559	434.254	
6.74	3950891.981	1347328.776	434.172	
6.75	3950888.394	1347325.900	434.283	
6.76	3950884.736	1347323.230	434.296	
6.77	3950881.012	1347320.427	434.223	
6.78	3950877.425	1347317.598	434.132	
6.79	3950873.900	1347314.531	434.041	
6.80	3950870.626	1347311.512	434.168	
6.81	3950867.277	1347308.327	434.268	
6.82	3950864.189	1347305.085	434.166	
6.83	3950860.656	1347301.842	434.099	
6.84	3950856.869	1347298.742	434.007	
6.85	3950853.571	1347295.760	434.330	
6.86	3950850.044	1347292.662	434.489	
6.87	3950846.518	1347289.777	434.239	
6.88	3950843.206	1347286.814	434.154	
6.89	3950839.976	1347283.677	434.250	
6.90	3950836.699	1347280.572	434.235	
6.91	3950833.442	1347277.624	434.095	
6.92	3950830.283	1347274.677	433.958	
6.93	3950827.112	1347271.427	433.962	
6.94	3950823.790	1347268.583	433.973	
6.95	3950820.220	1347265.732	433.898	
6.96	3950816.828	1347262.724	433.883	
6.97	3950813.547	1347260.027	433.894	
6.98	3950810.224	1347257.012	434.037	

6.99	3950807.036	1347253.377	434.078	
6.100	3950803.805	1347250.388	433.900	
6.101	3950800.178	1347247.398	433.903	
6.102	3950796.766	1347244.510	434.132	
6.103	3950793.802	1347241.577	434.180	
6.104	3950790.760	1347238.409	434.096	
6.105	3950787.840	1347235.489	434.282	
6.106	3950784.650	1347232.738	434.219	
6.107	3950781.052	1347230.527	433.996	
6.108	3950777.759	1347228.996	433.990	
6.109	3950774.760	1347226.691	434.418	
6.110	3950774.796	1347224.965	433.794	
6.111	3950775.480	1347224.233	433.815	
6.112	3950775.560	1347224.199	433.843	
6.113	3950775.530	1347223.878	433.893	
6.114	3950775.744	1347222.694	433.992	
6.115	3950777.114	1347220.178	434.184	
6.116	3950779.787	1347216.739	434.178	
6.117	3950782.112	1347212.679	434.233	
6.118	3950784.571	1347208.790	434.354	
6.119	3950787.141	1347205.078	434.313	
6.120	3950789.818	1347201.397	434.257	
6.121	3950792.854	1347197.799	434.205	
6.122	3950795.506	1347193.773	434.423	
6.123	3950798.296	1347189.931	434.419	
6.124	3950800.924	1347186.154	434.382	
6.125	3950803.903	1347182.263	434.282	
6.126	3950806.934	1347178.563	434.204	
6.127	3950809.869	1347174.649	434.251	
6.128	3950812.178	1347170.822	434.345	
6.129	3950814.932	1347166.908	434.198	
6.130	3950817.834	1347163.293	434.162	
6.131	3950820.616	1347159.494	434.185	
6.132	3950823.525	1347155.855	434.327	
6.133	3950826.555	1347152.245	434.422	
6.134	3950829.294	1347148.537	434.380	
6.135	3950832.161	1347145.211	434.191	
6.136	3950834.663	1347141.187	434.281	
6.137	3950837.534	1347137.636	434.349	

6.138	3950840.822	1347133.455	434.463	
6.139	3950843.161	1347130.184	434.393	
6.140	3950845.940	1347126.745	434.304	
6.141	3950849.124	1347123.400	434.467	
6.142	3950852.262	1347119.493	434.573	
6.143	3950855.156	1347115.828	434.438	
6.144	3950857.359	1347112.048	434.385	
6.145	3950859.980	1347108.403	434.511	
6.146	3950862.718	1347104.711	434.557	
6.147	3950865.204	1347100.959	434.464	
6.148	3950867.915	1347097.193	434.524	
6.149	3950870.642	1347093.364	434.509	
6.150	3950873.450	1347089.426	434.581	
6.151	3950876.147	1347085.513	434.687	
6.152	3950878.991	1347081.695	434.610	
6.153	3950881.948	1347078.407	434.439	
6.154	3950884.645	1347075.019	434.586	
6.155	3950887.090	1347071.159	434.441	
6.156	3950889.176	1347067.784	434.283	
6.157	3950891.109	1347064.734	434.254	
6.158	3950892.218	1347062.889	434.063	
6.159	3950892.325	1347062.668	434.062	
6.160	3950892.238	1347062.729	434.074	
6.161	3950892.196	1347062.697	434.090	
6.162	3950892.667	1347062.867	434.179	
6.163	3950894.495	1347064.425	434.212	
6.164	3950897.446	1347067.069	434.469	
6.165	3950900.960	1347070.335	434.438	
6.166	3950904.423	1347073.506	434.432	
6.167	3950907.997	1347076.167	434.540	
6.168	3950911.315	1347079.093	434.637	
6.169	3950914.723	1347082.394	434.600	
6.170	3950918.069	1347085.504	434.498	
6.171	3950921.417	1347088.789	434.331	
6.172	3950924.432	1347092.338	434.413	
6.173	3950927.573	1347095.584	434.413	
6.174	3950930.935	1347098.671	434.279	
6.175	3950934.428	1347101.678	434.050	
6.176	3950938.339	1347104.785	434.324	

6.177	3950941.264	1347108.355	434.253	
6.178	3950945.031	1347111.010	434.270	
6.179	3950948.713	1347113.969	434.177	
6.180	3950952.167	1347116.944	434.122	
6.181	3950955.839	1347120.182	434.163	
6.182	3950959.160	1347123.531	434.216	
6.183	3950962.528	1347126.747	434.220	
6.184	3950966.112	1347129.914	434.065	
6.185	3950969.491	1347132.657	433.880	
6.186	3950973.153	1347136.119	433.937	
6.187	3950976.737	1347138.958	434.098	
6.188	3950980.473	1347141.650	434.059	
6.189	3950984.108	1347144.951	434.002	
6.190	3950987.432	1347148.024	433.909	
6.191	3950990.811	1347151.290	434.072	
6.192	3950994.373	1347154.585	434.031	
6.193	3950997.851	1347157.592	433.907	
6.194	3951001.272	1347160.617	433.861	
6.195	3951004.532	1347163.849	433.999	
6.196	3951007.836	1347166.991	434.047	
6.197	3951011.471	1347170.075	433.876	
6.198	3951014.875	1347172.717	433.847	
6.199	3951018.250	1347175.730	434.026	
6.200	3951021.659	1347179.044	434.187	
6.201	3951025.151	1347181.954	434.248	
6.202	3951028.887	1347184.769	434.223	
6.203	3951032.072	1347187.838	434.379	
6.204	3951035.205	1347190.778	434.468	
6.205	3951038.294	1347193.252	434.303	
6.206	3951041.139	1347195.298	434.206	
6.207	3951042.678	1347196.221	433.799	
6.208	3951043.149	1347196.356	433.766	
6.209	3951043.222	1347196.315	433.767	
6.210	3951043.211	1347196.312	433.730	
6.211	3951043.230	1347196.290	433.744	
6.212	3951043.212	1347196.294	433.736	
6.213	3951043.192	1347196.280	433.752	
6.214	3951043.195	1347196.262	433.744	
6.215	3951043.197	1347196.288	433.728	

6.216	3951043.191	1347196.284	433.716	
6.217	3951043.163	1347196.304	433.715	
6.218	3951043.149	1347196.296	433.694	
6.219	3951043.163	1347196.286	433.706	
6.220	3951043.153	1347196.273	433.695	
6.221	3951043.153	1347196.262	433.702	
6.222	3951043.159	1347196.293	433.719	
7	3950976.636	1347131.410	433.948	
8	3950817.823	1347152.401	434.707	
9	3950865.640	1347169.300	431.850	
10.1	3950858.286	1347163.751	432.040	
10.2	3950858.288	1347163.736	432.023	
10.3	3950858.268	1347163.752	432.028	
10.4	3950858.283	1347163.762	432.046	
10.5	3950858.294	1347163.753	432.030	
10.6	3950858.267	1347163.785	432.031	
10.7	3950858.260	1347163.785	432.030	
10.8	3950858.261	1347163.752	432.015	
10.9	3950858.272	1347163.795	431.993	
10.10	3950858.258	1347163.821	431.993	
10.11	3950858.261	1347163.808	431.996	
10.12	3950858.243	1347163.824	432.016	
10.13	3950857.738	1347163.549	432.237	
10.14	3950858.625	1347161.434	432.168	
10.15	3950860.528	1347158.375	432.296	
10.16	3950862.687	1347155.304	432.099	
10.17	3950865.429	1347151.754	432.249	
10.18	3950868.442	1347148.939	432.268	
10.19	3950870.591	1347145.529	432.342	
10.20	3950873.746	1347142.082	432.192	
10.21	3950877.256	1347139.168	432.232	
10.22	3950881.331	1347136.700	432.199	
10.23	3950885.649	1347134.778	432.353	
10.24	3950889.688	1347133.043	432.093	
10.25	3950893.883	1347132.098	432.098	
10.26	3950898.516	1347131.948	432.181	
10.27	3950903.101	1347131.998	432.079	
10.28	3950907.438	1347131.770	432.083	
10.29	3950911.742	1347131.126	432.190	

10.30	3950916.352	1347130.971	432.359	
10.31	3950920.928	1347131.180	432.303	
10.32	3950925.414	1347131.686	432.159	
10.33	3950929.580	1347132.931	432.101	
10.34	3950933.749	1347134.585	432.605	
10.35	3950937.495	1347136.597	432.507	
10.36	3950941.283	1347138.095	432.132	
10.37	3950945.356	1347139.616	432.241	
10.38	3950949.426	1347141.304	432.599	
10.39	3950953.566	1347143.017	432.547	
10.40	3950957.502	1347144.256	432.483	
10.41	3950961.285	1347146.170	432.627	
10.42	3950964.583	1347148.552	432.565	
10.43	3950967.795	1347151.343	432.470	
10.44	3950971.189	1347154.366	432.635	
10.45	3950974.070	1347157.852	432.879	
10.46	3950976.833	1347161.992	432.835	
10.47	3950978.845	1347166.457	432.766	
10.48	3950980.148	1347170.532	432.963	
10.49	3950981.346	1347175.003	432.959	
10.50	3950982.591	1347179.448	432.880	
10.51	3950984.257	1347183.602	432.966	
10.52	3950985.914	1347187.632	432.951	
10.53	3950987.366	1347191.589	433.126	
10.54	3950987.485	1347195.724	433.063	
10.55	3950986.082	1347200.073	432.804	
10.56	3950984.632	1347204.224	432.506	
10.57	3950982.858	1347208.438	432.367	
10.58	3950981.334	1347212.579	432.480	
10.59	3950980.417	1347216.997	432.399	
10.60	3950979.625	1347221.442	432.439	
10.61	3950978.384	1347225.802	432.510	
10.62	3950976.238	1347229.925	432.551	
10.63	3950973.892	1347233.854	432.414	
10.64	3950971.555	1347237.613	432.317	
10.65	3950969.137	1347241.354	432.445	
10.66	3950966.860	1347244.949	432.515	
10.67	3950964.308	1347248.851	432.352	
10.68	3950962.040	1347252.564	432.168	

10.69	3950959.748	1347256.353	432.236	
10.70	3950956.837	1347260.032	432.490	
10.71	3950953.325	1347263.188	432.555	
10.72	3950949.546	1347265.562	432.552	
10.73	3950946.083	1347268.044	432.534	
10.74	3950942.121	1347270.298	432.621	
10.75	3950938.306	1347272.378	432.437	
10.76	3950934.463	1347274.275	432.297	
10.77	3950930.170	1347275.583	432.434	
10.78	3950925.634	1347275.998	432.483	
10.79	3950921.083	1347276.083	432.514	
10.80	3950916.658	1347276.005	432.334	
10.81	3950912.265	1347275.622	432.193	
10.82	3950907.934	1347275.111	432.362	
10.83	3950903.684	1347274.346	432.306	
10.84	3950899.519	1347273.076	432.169	
10.85	3950895.661	1347271.420	432.198	
10.86	3950891.588	1347269.533	432.328	
10.87	3950887.470	1347267.263	432.310	
10.88	3950883.201	1347265.356	432.161	
10.89	3950878.945	1347263.590	432.158	
10.90	3950874.860	1347261.646	432.277	
10.91	3950870.827	1347259.818	432.313	
10.92	3950867.077	1347257.835	432.231	
10.93	3950863.675	1347255.122	432.182	
10.94	3950860.296	1347252.024	432.305	
10.95	3950856.802	1347249.153	432.447	
10.96	3950853.725	1347246.309	432.226	
10.97	3950850.985	1347242.689	432.194	
10.98	3950848.375	1347239.120	432.026	
10.99	3950845.558	1347235.521	432.208	
10.100	3950843.207	1347231.873	432.101	
10.101	3950840.859	1347227.816	431.889	
10.102	3950838.841	1347223.752	431.951	
10.103	3950837.071	1347219.463	432.076	
10.104	3950836.348	1347215.170	432.101	
10.105	3950836.528	1347210.517	432.078	
10.106	3950837.320	1347205.973	431.894	
10.107	3950837.848	1347201.887	431.919	

10.108	3950838.657	1347198.048	431.973	
10.109	3950839.450	1347194.936	431.909	
10.110	3950840.141	1347192.217	432.164	
10.111	3950841.434	1347189.176	431.970	
10.112	3950842.413	1347185.682	432.007	
10.113	3950843.410	1347182.070	431.953	
10.114	3950844.825	1347179.416	431.804	
10.115	3950845.764	1347178.168	432.043	
10.116	3950845.690	1347177.845	432.080	
10.117	3950845.506	1347177.691	432.116	
10.118	3950845.409	1347177.626	432.122	
10.119	3950845.321	1347177.498	432.160	
10.120	3950845.277	1347177.470	432.122	
10.121	3950845.201	1347177.470	432.115	
10.122	3950845.165	1347177.336	432.101	
10.123	3950845.194	1347177.305	432.111	
10.124	3950845.110	1347177.328	432.121	
10.125	3950845.126	1347177.895	432.421	
10.126	3950845.357	1347176.808	432.186	
10.127	3950846.787	1347174.130	432.317	
10.128	3950849.093	1347170.722	432.131	
10.129	3950851.262	1347167.836	432.111	
10.130	3950853.669	1347164.849	432.054	
10.131	3950855.502	1347162.042	432.065	
10.132	3950856.654	1347161.098	432.147	
10.133	3950857.051	1347161.284	432.141	
11.1	3950864.772	1347168.438	431.996	
11.2	3950864.792	1347168.522	431.973	
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REPORT

FIRE TRAINING PIT SITE CHARACTERIZATION
FAIRBANKS INTERNATIONAL AIRPORT, ALASKA

LABORATORY DATA
QUALITY ASSURANCE REVIEW

AUGUST 2018

Prepared by: Jennifer McLean
Reviewed by: Christophe Venot

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SLR Project Number 105.01288.18002
ADEC Number 100.38.070

ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska
ALS	ALS Environmental
°C	degrees Celsius
CCV	continuing calibration verification
COC	chain of custody
DL	detection limit
DRO	diesel range organics
EDD	electronic data deliverable
GRO	gasoline range organics
ID	identifier
LCL	lower control limit
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LOD	limit of detection
LOQ	limit of quantitation
LV	low volume
mg/L	milligrams per liter
MB	method blank
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable
NFG	National Functional Guidelines
PAH	polynuclear aromatic hydrocarbons
PFBS	perfluorobutane sulfonic acid
PFAS	per- and polyfluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexane sulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
QA	quality assurance
QAR	quality assurance review
QC	quality control
RCRA	Resource and Conservation Recovery Act
RPD	relative percent difference
RRO	residual range organics
SDG	sample delivery group
SIM	selective ion monitoring
SLR	SLR International Corporation
SGS	SGS North America, Inc.
TCLP	toxicity characteristic leaching procedure
U	undetected
UCL	upper control limit
USEPA	United States Environmental Protection Agency
VOA	volatile organic analysis
VOC	volatile organic compounds

Introduction

This report summarizes a review of analytical data for samples collected on June 7, 2018 and June 8, 2018 in support of the Fire Training Pit Site Characterization at the Fairbanks International Airport, Fairbanks, Alaska. Samples were collected by SLR International Corporation (SLR). SGS North America, Inc. (SGS) and ALS Environmental (ALS) provided analytical support to the project. SGS and ALS both maintain current Alaska Department of Environmental Conservation (ADEC) Contaminated Sites approval number (SGS Number UST-005 and ALS Number UST-040) for analytical methods of interest, as applicable. Table 1 provides a summary of the work orders, sample receipt, analytical methods, and analytes.

Table 1 Summary of Work Orders, Sample Receipt, Methods, and Analytes

SDG	Date Collected	Date Received by Laboratory	Temp. Blank	Matrix	Analytical Method	Analyte	Analytical Laboratory Performing Analysis
1189378	6/7-8/2018	6/8/2018	SGS Fairbanks 0.3 °C 0.1 °C SGS Anchorage 2.7°C 2.8 °C	Soil And Water	AK101	GRO	SGS
					AK102	DRO	
					AK103	RRO	
					SW8260C	VOCs	
					SW6020A	RCRA Metals	
					SW1311/6020A	TCLP Metals	
					SW8270D	PAH SIM	
					SW8270D LV[1]	PAH SIM	
K1805460		6/9/2018	2.2 °C	Soil And Water	537M	PFAS[2]	ALS

Notes:
1 – The low volume (LV) method is used for water samples only.
2 - Perfluorinated compounds requested and analyzed were perfluorobutane sulfonic acid (PFBS), perfluorohexane sulfonic acid (PFHxS), perfluorooctane sulfonic acid (PFOS), perfluoroheptanoic acid (PFHpA), perfluorooctanoic acid (PFOA), and perfluorononanoic acid (PFNA).

Acronyms:
°C – degrees Celsius
DRO – diesel range organics
GRO – gasoline range organics
LV – low volume
PAH SIM – polynuclear aromatic hydrocarbons - selective ion monitoring
PFAS – perfluorinated compounds
RCRA – Resource and Conservation Recovery Act
RRO – residual range organics
SDG – sample delivery group
TCLP – toxicity characteristic leaching procedure
VOCs – volatile organic compounds

The SGS laboratory final report was provided as a Level II deliverables. The ALS laboratory final report was provided as a Level IV deliverable. Both included documentation of the delivery group chain of custodies (COCs) and sample receipt condition. Microsoft Access or Excel compatible electronic data deliverables (EDDs) for the reports were also provided. The PDF laboratory reports are provided electronically as Attachment 2.

Quality Assurance Program

A quality assurance (QA) program was followed for this project that addressed project administration, sampling, quality control (QC), and data review. SLR adhered to required and established sampling and COC protocols. The select laboratories maintain internal quality assurance program and standard operating procedures.

The analytical data was reviewed for consistency with any project-specific requirements in the project Work Plan (SLR, 2018), the ADEC Technical Memorandum *Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling* (ADEC, 2017b), National Functional Guidelines (NFG) [United States Environmental Protection Agency (USEPA), 2014], analytical method criteria, and laboratory criteria. ADEC Laboratory Data Review Checklists were completed for each SDG, and are included as Attachment 1 to this QAR. A review for any anomalies to the project requirements for precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS) are noted in this QAR, and any data qualifications discussed.

The data review included the following, as applicable:

- Reviewing COC records for completeness, signatures, and dates;
- Identifying any sample receipt or preservation anomalies that could impact data quality;
- Verifying that QC blanks (e.g., field blanks, equipment blanks, trip blanks, etc.) were properly prepared, identified, and analyzed;
- Evaluating whether laboratory reporting limits met project goals; Reviewing calibration verification recoveries, to include confirming that the laboratory did not identify that any Calibration Verification (CCV) recoveries or other calibration related criteria were outside applicable acceptance limits;
- Verifying that surrogate analyses were within recovery acceptance limits;
- Verifying that Laboratory Control Samples (LCS) and Laboratory Control Sample Duplicates (LCSD), and Matrix Spike (MS) and Matrix Spike Duplicate (MSD), were within recovery acceptance limits;
- Evaluating the result relative percent difference (RPD) between primary and duplicate field samples, LCS/LCSD, MS/MSD, and laboratory duplicates; and
- Providing an overall assessment of laboratory data quality and qualifying sample results if necessary.

Data Qualifications

As part of this QAR, qualifiers were applied to datum as determined necessary based on specified criteria, or professional judgement. In all cases, the basis for qualification and the applied data flag are discussed in this QAR. Table 2 provides a list of potential qualifiers (i.e., flags). These data flags were appended to the data as appropriate.

Table 2 Data Qualifiers

Lab Qualifier (Flag)	NFG Qualifier (Flag)	Equivalent Project Qualifier (Flag)[1,2]	Definition
U	U	**U**	The analyte was analyzed for, but was not detected above the limit of detection (LOD). This qualifier is appended by the laboratory.
J	NJ	**J**	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample between the limit of quantitation (LOQ) and the detection limit (DL). This qualifier is appended by the laboratory.
--	J	**Q**	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample, due to one or more laboratory quality control criteria (e.g., LCS recovery, surrogate spike recovery) failed or matrix effect. Where applicable, a "+" or "-" was appended to indicate a high bias, or a low bias respectively.
--	UJ	**UJ**	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
--	R	R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
--	--	**B**	Blank contamination: The analyte was positively identified in the blank (e.g., trip blank and/or method blank) associated with the sample and the concentration reported for the sample was less than ten times that of the blank. Where applicable, "U" was appended prior to the "B" to indicate the blank detection is greater than the sample detection and the result is likely a false positive.

Notes:

1 - Flags were appended to the data where applicable. The table presents laboratory, NFG and project equivalent qualifiers.

2 - Only flags in **bold** were applicable and appended to data for this project.

A discussion of the project data quality relative to PARCCS goals and summary of any anomalies or failures requiring data qualifiers follows.

Data Validation

Data Packages

The data packages were checked for transcription errors, omissions, or other anomalies. No issues were noted with regards to the data packages, except as noted below.

Work order 1189378

- The COC listed "RCRA metals TCLP SW 6020A" for soil and water samples. Via email and discussion between SLR personnel and SGS it was determined that soil samples should be analyzed by TCLP RCRA metals (SW1311/SW6020A) and water samples analyzed for total RCRA metals by SW6020A. All samples were analyzed for the requested methods. Data was not impacted.

Work order K1805460

- The COC requested a level II deliverable data package, but the laboratory provided a level IV report. Data was not impacted.

Sample Receipt

The sample receipt documentation was checked for anomalies. No issues were noted with regards to the receipt of the samples, except as noted below.

Work order 1189378

- Sample SS3 DRO and RRO sample was received in an SGS provided 250 mL jar instead of the 4 ounce jar typically used for soil samples. Adequate volume was provided in a method appropriate container. Data was not impacted.

- Samples MW3 and MW29 arrived at the laboratory with one or more VOA vials containing air bubbles greater than 6 millimeters. For sample MW3, only one of six VOA vials contained headspace. For sample MW29, three of six VOA vials contained air bubbles. In both instances, presumably the laboratory used VOA vials without headspace for analysis. Data was not impacted.

Work order K1805460

- The type and condition of ice, presence/absence and condition of custody seals was not recorded on the COC. These were documented on the sample receipt form. Sample integrity was not compromised. Data was not impacted.

- The six perfluorinated sulfonic acids and perfluorinated carboxylic acids requested were not listed on the COC. They were noted on the project bid and confirmed via email upon submittal of samples to ALS laboratory. Data was not impacted.

Holding Times and Preservation
Samples were appropriately preserved and were submitted to SGS and ALS. Sample analyses were conducted within holding time criteria. No issues were noted in regard to sample preservation.

Laboratory Method Blanks
Laboratory method blanks were analyzed at the appropriate frequencies. Analytes were undetected (U) in any method blanks at or above the LOD or DL, except as listed in Table 3. Associated sample results of U or greater than ten times that of the blank detection were considered unaffected, and were not shown in Table 3. Data were qualified as noted in the table with either a “B” to indicate associated sample detection within ten times that of the blank, potentially biased high, or a “UB” to indicate detections less than the blank detection, potentially a false positive. Since a high bias was indicated, and all affected results were below applicable regulatory criteria, data usability was not impacted.

Table 3 Method Blank Detections and Affected Samples

SDG	Sample ID	Lab ID	Batch	Method	Analyte	Result	LOD	Flag	Applicable Cleanup Criteria[1]
						(mg/kg)	(mg/kg)		(mg/L)
1189378	MB	1452274	MXT5639	SW1311/6020A	TCLP Chromium	0.0101	0.01	J	NA
	BH99	1189378009	MXT5639	SW1311/6020A	TCLP Chromium	0.0859	0.1	J, B	5.0 [1]
	MB	1452274	MXT5639	SW1311/6020A	TCLP Mercury	0.000557	0.0005	J	NA
	BH2-D	1189378004	MXT5639	SW1311/6020A	TCLP Mercury	0.00385	0.005	J, B	0.2 [1]
	BH3-S	1189378005	MXT5639	SW1311/6020A	TCLP Mercury	0.00362	0.005	J, B	0.2 [1]
	BH3-D	1189378006	MXT5639	SW1311/6020A	TCLP Mercury	0.00437	0.005	J, B	0.2 [1]
	BH4-S	1189378007	MXT5639	SW1311/6020A	TCLP Mercury	0.00372	0.005	J, B	0.2 [1]
						(mg/L)	(mg/L)		(mg/L)
	MB	1451489	MXX31638	SW6020A	Mercury	0.0000751	0.0001	J	NA
	MW1	1189378016	MXX31638	SW6020A	Mercury	0.0000667	0.0001	J, UB	0.00052
	MW2	1189378017	MXX31638	SW6020A	Mercury	0.000171	0.0001	J, B	0.00052
	MW3	1189378018	MXX31638	SW6020A	Mercury	0.0000883	0.0001	J, B	0.00052
	MW4	1189378019	MXX31638	SW6020A	Mercury	0.0000734	0.0001	J, UB	0.00052
	MW29	1189378020	MXX31638	SW6020A	Mercury	0.0000952	0.0001	J, B	0.00052
K1805460[3]	MB	KQ1807849-03	315741	537M	PFNA	0.0000012	0.00000188	J	NA[2]
	MW3	K1805460-033	315741	537M	PFNA	0.000002	0.00000188	J, B	NA[2]
	MW2	K1805460-034	315741	537M	PFNA	0.000011	0.0000188	J, B	NA[2]
	MW4	K1805460-035	315741	537M	PFNA	0.0000011	0.00000188	J, UB	NA[2]
	MW29	K1805460-036	315741	537M	PFNA	0.0000094	0.0000188	J, B	NA[2]
	MB	KQ1807913-02	315742	537M	PFNA	0.00036	0.0006	J	NA[2]
	SW1	K1805460-037	315742	537M	PFNA	0.0013	0.0006	J, B	NA[2]
						(mg/kg)	(mg/kg)		(mg/kg)
K1805460	MB	KQ1807773-04	315665	537M	PFHxS	0.00024	0.00034	J	NA[2]
	BH3-S	K1805460-001	315665	537M	PFHxS	0.0011	0.00034	B	NA[2]
	BH2-S	K1805460-003	315665	537M	PFHxS	0.00098	0.00034	B	NA[2]
	BH7-D	K1805460-005	315665	537M	PFHxS	0.00096	0.00036	J, B	NA[2]
	BH6-S	K1805460-007	315665	537M	PFHxS	0.00092	0.00034	J, B	NA[2]
	BH4-S	K1805460-015	315665	537M	PFHxS	0.0013	0.00034	J, B	NA[2]
	BH11-S	K1805460-017	315665	537M	PFHxS	0.00075	0.00034	J, B	NA[2]
	BH11-D	K1805460-018	315665	537M	PFHxS	0.0018	0.00034	B	NA[2]
	BH12-D	K1805460-020	315665	537M	PFHxS	0.0021	0.00042	J, B	NA[2]
	MB	KQ1807773-04	315665	537M	PFNA	0.00023	0.00036	J	NA[2]
	BH3-S	K1805460-001	315665	537M	PFNA	0.00027	0.00036	J, B	NA[2]
	BH3-D	K1805460-002	315665	537M	PFNA	0.00025	0.00046	J, B	NA[2]

Table 3 Method Blank Detections and Affected Samples

SDG	Sample ID	Lab ID	Batch	Method	Analyte	Result	LOD	Flag	Applicable Cleanup Criteria[1]
						(mg/kg)	(mg/kg)		(mg/kg)
K1805460[3]	BH2-S	K1805460-003	315665	537M	PFNA	0.00030	0.00036	J, B	NA[2]
	BH2-D	K1805460-004	315665	537M	PFNA	0.00022	0.00040	J, UB	NA[2]
	BH7-D	K1805460-005	315665	537M	PFNA	0.00029	0.00038	J, B	NA[2]
	BH7-S	K1805460-006	315665	537M	PFNA	0.00031	0.00046	J, B	NA[2]
	BH6-S	K1805460-007	315665	537M	PFNA	0.0012	0.00036	B	NA[2]
	BH6-D	K1805460-008	315665	537M	PFNA	0.00027	0.00038	J, B	NA[2]
	BH8-S	K1805460-009	315665	537M	PFNA	0.00033	0.00036	J, B	NA[2]
	BH8-D	K1805460-010	315665	537M	PFNA	0.00035	0.00042	J, B	NA[2]
	BH9-S	K1805460-011	315665	537M	PFNA	0.00033	0.00040	J, B	NA[2]
	BH9-D	K1805460-012	315665	537M	PFNA	0.00033	0.00046	J, B	NA[2]
	BH10-S	K1805460-013	315665	537M	PFNA	0.00082	0.00036	J, B	NA[2]
	BH10-D	K1805460-014	315665	537M	PFNA	0.0011	0.00036	B	NA[2]
	BH4-S	K1805460-015	315665	537M	PFNA	0.00035	0.00036	J, B	NA[2]
	BH4-D	K1805460-016	315665	537M	PFNA	0.00022	0.00042	J, UB	NA[2]
	BH11-S	K1805460-017	315665	537M	PFNA	0.00055	0.00036	J, B	NA[2]
	BH11-D	K1805460-018	315665	537M	PFNA	0.00055	0.00036	J, B	NA[2]
	BH12-S	K1805460-019	315665	537M	PFNA	0.00031	0.00036	J, B	NA[2]
	BH12-D	K1805460-020	315665	537M	PFNA	0.00061	0.00042	J, B	NA[2]
	MB	KQ1807793-04	315665	537M	PFNA	0.00022	0.00036	J	NA[2]
	BH1-S	K1805460-21	315665	537M	PFNA	0.00059	0.00038	J, B	NA[2]
	BH1-D	K1805460-22	315665	537M	PFNA	0.00023	0.00042	J, B	NA[2]
	BH5-S	K1805460-23	315665	537M	PFNA	0.00060	0.00036	J, B	NA[2]
	BH5-D	K1805460-24	315665	537M	PFNA	0.00023	0.00036	J, B	NA[2]
	BH99	K1805460-25	315665	537M	PFNA	0.00025	0.00038	J, B	NA[2]
	BH98	K1805460-26	315665	537M	PFNA	0.00036	0.0040	J, B	NA[2]
	BH97	K1805460-27	315665	537M	PFNA	0.00073	0.00036	J, B	NA[2]
	SS1	K1805460-38	315665	537M	PFNA	0.00060	0.00036	J, B	NA[2]
	SS2	K1805460-39	315665	537M	PFNA	0.00097	0.00038	J, B	NA[2]
	SS3	K1805460-40	315665	537M	PFNA	0.00053	0.00036	J, Q[4]	NA[2]

Notes:

1 – Cleanup criteria for TCLP are those listed in 40 CFR part 261.24. Cleanup criteria for all other analytes are those listed in 18 AAC 75, Tables B1, B2, and C.

2 – No groundwater criteria currently exist for this analyte.

3 - Per ADEC guidance (ADEC, 2017a), twice the detection limit (DL) was used to estimate the LOD.

4 – This data also had low surrogate recovery. Contradictory flagging (high bias due to blank detection and low bias due to surrogate) was considered inappropriate. Data were qualified "Q" as estimated with unknown bias.

mg/kg – milligrams per kilogram mg/L – milligrams per kilogram MB – Method Blank NA – not applicable

Trip Blanks, Field Blanks and Rinsate Blanks
Trip blanks were analyzed at the appropriate frequencies for all work orders for all appropriate volatile analyses (GRO by AK 101 and VOCs by SW8260C). All trip blanks had results of undetected for all analytes.

For PFAS congeners, one soil rinsate blank was collected per every 20 soil samples and one field blank was collected for each day of sampling. Due to the lack of preservation for Method 537M, both rinsate blanks and field blanks for both soil and water samples were water matrix. All rinsate blanks and field blanks had results of undetected, except as noted in Table 4. Associated sample results of U or greater than ten times that of the blank were considered unaffected, and were not presented in the table. Allowing for reporting units, with field blanks reported in nanograms per liter (ng/L) and soil samples reported in nanograms per gram (ng/g), all associated samples had detectable results well over ten times that of the field blank detections shown. No data was affected. All data was usable without qualification.

Table 4 Trip Blank, Field Blank, and Rinsate Blank Detections and Affected Data

SDG	Sample ID	Lab ID	Method	Analyte	Result (mg/L)	LOD (mg/L)	Flag
K1805460	FB2	K1805460-029	537M	PFHxS	0.0000011	0.00000188	J
	FB2	K1805460-029	537M	PFOS	0.0000025	0.000002	J

Reporting Limits
For undetectable results, LODs were compared to applicable regulatory criteria for the site. For waters, LODs were compared to 18 Alaska Administrative Code (AAC) 75.345 Table C, *Groundwater Cleanup Levels* (ADEC, 2017c). For soils, LODs were compared to 18 AAC 75.341 *Method Two Soil Cleanup Levels, the lowest of the Under 40 inch Zone or Migration to Groundwater* (ADEC, 2017c). No groundwater or soil criteria currently exist for PFAS, PFHxS, PFNA, PFBS, and PFHpA. TCLP RCRA metals results were compared to 40 Code of Federal Regulations (CFR), Part 261.24.

Except as noted in Tables 2 and 3 of the report, all results of undetectable analytes had LODs at or below applicable regulatory levels. For select VOC analytes, typical laboratory technological methodology limitations resulted in LODs which did not meet the ADEC limits. Where LODs did not meet project action limits, the analytical data for these samples for these analytes is valid, but it was not possible to report with complete certainty whether the analyte was present in the sample below the LOD but above regulatory criteria. The usability of the data is limited for this purpose. All data is usable, and all results of not detected confirm the absence of target analyte to the level of the reported LOD.

Continuous Calibration Verifications (CCVs)
CCVs were analyzed at the appropriate frequencies. CCV data was included only in the EDD for the SGS laboratory report, not in the case narrative. CCV data was included only in the PDF for the ALS laboratory report. All CCV recoveries were within acceptable limits for ALS. All CCV recoveries were within acceptable limits for SGS, except as noted below.

<u>For work order 1189378</u>

- For Method SW8260C, one CCV for batch VMS17882 recovered at 124% for hexachlorobutadiene, slightly above acceptable upper control limit (UCL) of 120%. All

associated samples had undetectable results for the impacted analyte; therefore, data was not affected. All data was usable without qualification.

- For Method SW8260C, one CCV for batch VMS17897 recovered at 126% for bromomethane, slightly above acceptable UCL of 120%. All associated samples had undetectable results for the impacted analyte; therefore, data was not affected. All data was usable without qualification.

Internal Standard Results

No internal standards were noted in the case narrative as being outside of acceptance limits for the SGS laboratory report. Internal standard performance was not otherwise presented in the SGS laboratory report or in the EDD. All internal standards were within acceptable limits as reviewed in the ALS laboratory report. Internal standards criteria were considered met.

Surrogate Recovery Results

Surrogate analysis was performed at the required frequencies. Surrogates were not evaluated when samples were analyzed at dilutions of greater than five-fold as surrogate may not accurately quantify target analyte at such dilutions. All surrogate recoveries were within analytical method and SGS percent recovery acceptance limits, except as noted in Table 5. Data qualified as noted in the table included:

- Fluoroanthrene-d10 surrogate recovery exceedance was likely due to matrix interference, thus the impact to data was considered minimal. All data was usable as qualified; and

- For PFNA surrogate recovery exceedance, no cleanup criteria exist, therefore data was considered usable as qualified.

For the affected PAH SIM analytes, all results were undetectable with LODs well below applicable cleanup criteria. Therefore, all data was usable as qualified.

Table 5 Surrogate Recovery Exceedances and Affected Data

SDG	Sample ID	Lab ID	Method Analyte	Surrogate	Sur. Rec.	Dil	LCL-UCL	Result (mg/kg)	Flag
1189378	SW1	1189378021	SW8270D	Fluoroanthene-d10	19%	1	24-116%	U	UJ[1]
K1805460	SS3	K1805460-040	537M PFNA	13C5-PFNA	45%	1	50-150%	0.00053 J	Q[2]

Notes:

1 – Analytes associated with fluoranthene-d10 surrogate, thus impacted, are benzo(a)Anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-c,d] pyrene, and pyrene. Per NFG guidelines these analytes were qualified UJ, and should be considered as estimated non-detects.

2 – This data also had a high bias indicated due to an associated blank detection. Contradictory flagging (high bias due to blank detection and low bias due to surrogate recovery) was considered inappropriate. Data were qualified "Q" as estimated with unknown bias.

Acronyms

Dil. – dilution
LCL – lower control limit
UCL – upper control limit

Laboratory Control Samples and Laboratory Control Duplicate Samples
LCS and LCSDs were analyzed at the appropriate frequencies. All LCS and LCSD recoveries and RPDs were within acceptable limits, except as noted below.

For work order 1198378

- For chloromethane by Method SW8260C, the LCS/LCSD RPD of 21% for batch VXX32390 slightly exceeded the allowable limit of 20%. This batch also included a non-project specific MS/MSD pair with an acceptable RPD for chloromethane. Samples MW1, MW2, MW3, MW4, MW29, and SW1, and Trip Blank 2 were included in this batch. All samples included in the batch had undetectable results for chloromethane. It was considered inappropriate to qualify undetectable results as having unknown bias based on an RPD exceedance. All data was considered usable without qualification.

Matrix Spike and Matrix Spike Duplicate Samples
MS and MSDs were analyzed at the appropriate frequencies. All MS/MSD percent recoveries and RPDs were within acceptable limits, except as listed in Table 6. MS/MSD recoveries and RPDs were not evaluated, or listed, when the parent sample concentrations were greater than four times that of the spike amount, or when the MS/MSD were analyzed at a dilution of greater than five-fold due to matrix or high target analyte concentration, as these may impede accurate recovery quantification. In all cases the associated LCS recoveries were within acceptable limits establishing batch accuracy. Except as noted in the LCS/LCSD section, all LCS/LCSD RPDs were within acceptable limits establishing precision. Where an LCS/LCSD established accuracy and/or precision, only the MS/MSD parent sample was considered impacted, thus qualified due to an MS/MSD recovery or RPD exceedance.

For PFOS, where a high bias was indicated, the detected result was over 30-fold above the applicable ADEC criteria. All data was usable as qualified.

Table 6 MS/MSD Recovery and RPD Exceedances and Affected Data

SDG	Parent Sample ID [Lab ID]	Batch	Method	Analyte	Parent Result	MS Recovery	MSD Recovery	LCL-UCL	MS/MSD RPD	RPD Limit	Flag
					(mg/L)						
1189378	Non Project Specific 1452448 MS/MSD [1452449/1452450]	VXX32390	SW8260C	several analytes	varied	range of exceedances 127%-170%	range of exceedances 72%-155%	range of exceeded limits (66%-143%)	33% (butanone only)	20%	NA[1]
	Non Project Specific 1453232 [1453233/1453234]	VXX32418	SW8260C	Trichloro fluoromethane	U	109%	137%	62-140%	23%	20%	NA[2]
	Non Project Specific 1453477 [1453478/1453479]	VXX32426	SW8260C	several analytes	varied	range of exceedances 47%-156%	range of exceedances 54%-72%	range of exceeded limits (75%-135%)	21%-27% (4 analytes exceeded)	20%	NA[3]
					mg/kg						
K1805460	BH1-S	315682	537M	PFOS	0.100	177%	123%	50%-150%	36%	50%	Q+[4]

Notes:

1 – The LCS and LCSD recovered within acceptable limits, establishing batch accuracy. Also, except as noted in the LCS/LCSD section, all LCS/LCSD RPDs were within acceptable limits, establishing batch precision. Data were not qualified based on non-project specific MS/MSD exceedances.

2 – The LCS for this batch recovered within acceptable limits for all analytes, establishing accuracy. Because no LCSD was analyzed, the only measure of precision for this batch is the non-project specific MS/MSD. Trichlorofluoromethane results for batch associated samples BH1-S, BH1-D, BH2-S, AND BH2-D were all undetectable. It was considered inappropriate to qualify undetectable results as estimated values with unknown bias. All data was considered usable without qualification.

3 - The LCS for this batch recovered within acceptable limits for all analytes, establishing accuracy. Because no LCSD was analyzed, the only measure of precision for this batch is the non-project specific MS/MSD. Only Trip Blank 1 was included in this batch, with all results of undetectable. Data was considered not impacted. All data was usable without qualification.

4 – The LCS recovered within acceptable limits, establishing batch accuracy. Per NFG guidelines (NFG, 2014), the original (parent) sample was qualified as having an estimated value with unknown bias.

Field Duplicates
The field duplicate sample frequency is presented in Table 7. Parent sample and field duplicates are presented in Table 8. For all methods and analytes, the frequency satisfied the requirement of one per 10 samples or less per matrix and analyte. Field duplicates were submitted blind to the laboratory.

Samples SS1, SS2, SS3, and SW1 were collected for waste characterization purposes only. Field duplicates are not required for waste characterization samples. These samples are excluded from the parent sample and field duplicate counts.

All parent sample/field duplicate RPDs were within the ADEC required 30% for waters and 50% for soils, except as noted in Table 9, with chronologically associated samples listed in the table footnotes. Parent sample/field duplicate pairs were qualified as shown in the table. For all chronologically associated field samples and analytes, detected results were qualified "Q" and non-detect results were qualified "UJ".

To err on the conservative, for parent sample and field duplicate pairs, the higher of the two values should be used for reporting purposes. In all cases, laboratory precision was established by either an LCS/LCSD or an MS/MSD pair with RPDs within acceptable limits, thus the impact to data was considered minimal. All data was considered usable as qualified.

Parent sample/field duplicate pairs with both results below the LOQ were considered acceptable without qualification.

Table 7 Field Duplicate Count

SDG	Matrix	No. of Primary Samples	No. of Field Duplicates	Method	Analyte
1189378	soil	8	1	GRO	AK101
		10	2	DRO	AK102
		10	2	RRO	AK103
		8	1	SW8260C	VOCs
		8	1	SW8270D	PAH SIM
		8	1	TCLP RCRA Metals	SW1311/SW6020A
	water	4	1	GRO	AK101
		4	1	DRO	AK102
		4	1	RRO	AK103
		4	1	SW8260C	VOCs
		4	1	SW8270D LV	PAH SIM
		4	1	RCRA Metals	SW6020A
K1805436	soil	24	3	537M	PFAS
	water	4	1	537M	PFAS

Table 8 Parent Samples and Field Duplicates

SDG	Matrix	Parent Sample	Field Duplicate	Method	Analytes	RPDs Acceptable (Y/N)
1189378	Soil	BH2-D	BH99	AK101 AK 102 AK103 SW8260C SW8270D SW1311/SW6020A	GRO DRO RRO VOCs PAH SIM TCLP RCRA Metals	Y Y Y Y Y Y
		BH7-S	BH96	AK 102/AK103	DRO/RRO	Y
	Water	MW2	MW29	AK101 AK 102 AK103 SW8260C SW8270D LV SW6020A	GRO DRO RRO VOCs PAH SIM RCRA Metals	Y Y Y Y Y N
K1805460	Soil	BH1-S	BH97	537M	PFAS	Y
		BH9-D	BH98	537M	PFAS	Y
		BH2-D	BH99	537M	PFAS	N
	Water	MW2	MW29	537M	PFAS	Y

Table 9 Field Duplicate RPD Exceedances and Affected Data

SDG Matrix	Parent Sample	Duplicate Sample	Method	Analyte	Primary Result (mg/L)	Duplicate Result (mg/L)	RPD	Flag
1189378 Water	MW2[1]	MW29[1]	SW6020A	chromium	0.0094	0.0236	86	Q
				lead	0.00747	0.0113	41	Q
					mg/kg	**mg/kg**		
K1805460 Soil	BH2-D[2]	BH99[2]	537M	PFOA	0.0021	0.0012	55	Q

Note:

1 –Samples associated with this field duplicate pair were MW1, MW3, MW4, and SW1. Chromium and lead results for associated samples were qualified either “Q” for detected results or “UJ” for undetectable results.

2 - Three soil field duplicate pairs were collected on June 7, 2018. Samples chronologically associated with this field duplicate pair were BH2-S, BH3-S, BH3-D, BH6-S, BH6-D, BH7-D, BH7-S, BH8-S, BH8-D, and BH9-S. PFOA results for associated samples were qualified either “Q” for detected results or “UJ” for undetectable results.

Laboratory Duplicate Samples
Laboratory duplicates were analyzed at appropriate frequencies for percent solids and PFAS. All duplicate RPDs were within acceptable limits.

Summary of Quality Assurance review

- **Precision:** Precision goals were met, except as noted in the LCS/LCSD, MS/MSD, and Field Duplicates sections.
- **Accuracy:** Accuracy goals were met, except as noted in the CCV, Surrogate Recovery, and MS/MSD sections.
- **Representativeness:** Representativeness goals were met. The samples were collected from appropriate locations in accordance with planning documents and ADEC requirements.
- **Comparability:** Comparability goals were met. The majority of analysis were performed by SGS, Anchorage. Only PFAS by Method 537M were analyzed at ALS, Kelso. Typical methods were used for all analysis.
- **Completeness:** Completeness goals were met. The data were 100% complete with respect to analysis.
- **Sensitivity:** Sensitivity goals were met, except as noted in the Method Blanks; Trip Blanks, Field Blanks and Rinsate Blanks; and Reporting Limits sections.

This data were considered of good quality acceptable for use with the noted qualifications. No data were rejected.

References

Alaska Department of Environmental Conservation (ADEC), 2017a. ADEC Technical Memorandum *Guidelines for Treatment of Non-Detect Values, Data Reduction for Multiple-Detections and Comparison of Quantitation Limits to Cleanup Values.* April.

ADEC, 2017b. ADEC Technical Memorandum *Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling.* March.

ADEC, 2017c. 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control.* November 7.

National Functional Guidelines (NFG), 2014. EPA-540-R-014-002. *National Functional Guidelines for Superfund Organic Methods Data Review.* August.

SLR International Corporation (SLR), 2018. *Fire Training Pit Site Characterization Work Plan, Fairbanks International Airport.* May.

United States Environmental Protection Agency (USEPA). 2014. *National Functional Guidelines for Superfund Organic Methods Data Review.* August.

Attachments

Attachment 1 – ADEC Laboratory Data Review Checklists
Attachment 2 – Laboratory Deliverables

Attachment 1
ADEC Laboratory Data Review Checklists

Laboratory Data Review Checklist

Completed by:

Nicholas Wells

Title:

Staff Engineer

Date:

July 19, 2018

CS Report Name:

FIA – Fire Training Pit

Report Date:

June 29, 2018

Consultant Firm:

SLR International Corporation

Laboratory Name:

SGS Anchorage, AK

Laboratory Report Number:

1189378

ADEC File Number:

100.38.070

Hazard Identification Number:

1. Laboratory

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

   (•) Yes ( ) No Comments:

   All analyses were conducted at SGS, Anchorage. SGS is ADEC CS approved, certificate number UST-005.

   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 Comments:

   Not applicable. All analyses were conducted at SGS, Anchorage.

2. Chain of Custody (COC)

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

   (•) Yes ( ) No Comments:

   b. Correct analyses requested?

   (•) Yes ( ) No Comments:

   The COC listed "RCRA metals TCLP SW 6020A" for soil and water samples. Via email and discussion between SLR personnel and SGS it was determined that soil samples should be analyzed by TCLP RCRA metals (SW1311/SW6020A) and water samples analyzed for total RCRA metals by SW6020A. All samples were analyzed for the requested methods. Data was not impacted.

3. Laboratory Sample Receipt Documentation

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

   (•) Yes ( ) No Comments:

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

   (•) Yes ( ) No Comments:

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

   (•) Yes ( ) No Comments:

   Samples MW3 and MW29 arrived at the laboratory with one or more VOA vials containing air bubbles greater than 6 millimeters. For sample MW3, only one of six VOA vials contained headspace. For sample MW29, three of six VOA vials contained air bubbles. In both instances, presumably the laboratory used VOA vials without headspace for analysis. Data was not impacted.

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 Comments:

Sample SS3 DRO and RRO sample was received in an SGS provided 250 mL jar instead of the 4 ounce jar typically used for soil samples. Adequate volume was provided in a method appropriate container.

e. Data quality or usability affected?

Comments:

Data was not impacted.

4. Case Narrative

a. Present and understandable?

(●) Yes ( ) No Comments:

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

(●) Yes ( ) No Comments:

c. Were all corrective actions documented?

(●) Yes ( ) No Comments:

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

Comments:

No impact.

5. Samples Results

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

(●) Yes ( ) No Comments:

The COC listed “RCRA metals TCLP SW 6020A” for soil and water samples. Via email and discussion between SLR personnel and SGS it was determined that soil samples should be analyzed by TCLP RCRA metals (SW1311/SW6020A) and water samples analyzed for total RCRA metals by SW6020A. All samples were analyzed for the requested methods. Data was not impacted.

b. All applicable holding times met?

(●) Yes ( ) No Comments:

c. All soils reported on a dry weight basis?

(•) Yes ( ) No Comments:

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

( ) Yes (•) No Comments:

For undetectable results, LODs were compared to 18 Alaska Administrative Code (AAC) 75 Tables B1, B2, and C. TCLP RCRA metals results were compared to 40 Code of Federal Regulations (CFR), Part 261.24.
Except as noted in Tables 2 and 3 of the report, all results of undetectable analytes had LODs at or below applicable regulatory levels. For select VOC analytes, typical laboratory technological methodology limitations resulted in LODs which did not meet the ADEC limits.

e. Data quality or usability affected?

Comments:

Where LODs did not meet project action limits, the analytical data for these samples for these analytes is valid, but it was not possible to report with complete certainty whether the analyte was present in the sample below the LOD but above regulatory criteria. The usability of the data is limited for this purpose. All data is usable, and all results of not detected confirm the absence of target analyte to the level of the reported LOD.

6. QC Samples

a. Method Blank

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

(•) Yes ( ) No Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

(•) Yes ( ) No Comments:

One method blank for TCLP Chromium and TCLP Mercury was detected above the LOD but below the LOQ. One method blank for total Mercury was detected above the DL but below the LOD.

iii. If above LOQ, what samples are affected?

Comments:

N/A

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

Batch associated samples with results within ten times that of the blank were qualified “B” for detected results greater than the blank detection, and “UB” for detected results below the blank detection (possibly false positive results).
Qualified data is shown in Table 3 of the QAR.

◉ Yes ○ No Comments:

v. Data quality or usability affected?

Comments:

Since a high bias was indicated, and all affected results were below applicable the applicable regulatory criteria, data usability was not impacted.

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 Comments:

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

◉ Yes ○ No Comments:

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

○ Yes ◉ No Comments:

For Method SW8260C:
1- One CCV for batch VMS17882 recovered at 124% for hexachlorobutadiene, slightly above acceptable upper control limit (UCL) of 120%.
2 - One CCV for batch VMS17897 recovered at 126% for bromomethane, slightly above acceptable UCL of 120%.
3 – Two non-project specific batch MS/MSDs had recoveries for several analytes outside acceptable limits. In both instances, the LCS or LCS/LCSD recovered within acceptable limits.

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

○ Yes ◉ No Comments:

LCS/LCSD - For chloromethane by Method SW8260C, the LCS/LCSD RPD of 21% for batch VXX32390 slightly exceeded the allowable limit of 20%. This batch also included a non-project specific MS/MSD pair with an acceptable RPD for chloromethane. Samples MW1, MW2, MW3, MW4, MW29, and SW1, and Trip Blank 2 were included in this batch. All samples included in the batch had undetectable results for chloromethane.
MS/MSD – For Method SW8260C, three non-project specific batch MS/MSD pairs had between one and four target analytes with RPDs exceeding the allowed 20% limit.

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

Comments:

CCV recoveries - All associated samples had undetectable results for both impacted analytes; therefore, data was not affected. All data was usable without qualification.
MS/MSD recoveries - Because the LCS or LCS/LCSD established accuracy, only the parent sample, not associated with this project was affected.
LCS/LCSD RPD - It was considered inappropriate to qualify undetectable results as having unknown bias based on an RPD exceedance. All data was considered usable without qualification.
MS/MSD RPDs – In all cases, either the LCS/LCSD established batch precision or all associated samples had results of undetectable for the impacted analytes. Undetectable results were considered not impacted by RPD exceedances.

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

○ Yes ◉ No Comments:

It was considered inappropriate to qualify undetectable results as having either unknown bias (due to RPD exceedances) or as having a high bias. No data from this work order was qualified.

vii. Data quality or usability affected?

Comments:

All data for this work order was usable without qualification.

c. Surrogates – Organics Only

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

◉ Yes ○ No Comments:

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

○ Yes ◉ No Comments:

PAH surrogate Fluoroanthene-d10 was recovered outside acceptable limits for one sample: Sample SW1, Fluoroanthene-d10 recovered at 19%, below the lower control limit of 24%.

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

◉ Yes ○ No Comments:

Analytes associated with fluoranthene-d10 surrogate, thus impacted, are benzo(a)Anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, fluoranthene, indeno[1,2,3-c,d] pyrene, and pyrene. Per NFG guidelines these analytes were qualified UJ, and should be considered as estimated non-detects.

iv. Data quality or usability affected?

Comments:

All affected analytes have undetectable results with LODs well below the applicable regulatory criteria. Therefore, all data was usable as qualified.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and cooler?

(•) Yes ( ) No Comments:

Trip blanks were analyzed at the appropriate frequencies for all volatile analyses (GRO by AK 101 and VOCs by SW8260C).

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 Comments:

iii. All results less than LOQ?

( ) Yes ( ) No Comments:

Yes

iv. If above LOQ, what samples are affected?

Comments:

Not applicable. No samples were affected.

v. Data quality or usability affected?

Comments:

All volatile samples were accompanied by a trip blank at all times. No data was affected.

e. Field Duplicate

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

(•) Yes ( ) No Comments:

Samples SS1, SS2, SS3, and SW1 were collected for waste characterization purposes only. Field duplicates are not required for waste characterization samples. These samples are excluded from the parent sample and field duplicate counts.

ii. Submitted blind to lab?

(•) Yes ( ) No Comments:

Soil parent sample BH2-D corresponds to duplicate BH99 for all analyses.
Soil parent sample BH7-S corresponds to duplicate BH96 for DRO/RRO only.
Water parent sample MW2 corresponds to duplicate MW29 for all analyses.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

○ Yes ◉ No Comments:

Samples MW2 and MW29 exceeded the 30% RPD: for total chromium, RPD of 86%, and total lead, RPD of 41%.

iv. Data quality or usability affected?

Comments:

Samples associated with this field duplicate pair were MW1, MW3, MW4, and SW1. Chromium and lead results for associated samples were qualified either "Q" for detected results or "UJ" for undetectable results. All impacted results were over 100-fold below the applicable cleanup level. Data usability was not impacted.

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

○ Yes ○ No ◉ Not Applicable

i. All results less than LOQ?

◉ Yes ○ No Comments:

Dedicated or disposable sampling equipment was used in the collection of all samples.

ii. If above LOQ, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected?

Comments:

Not applicable.

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

   a. Defined and appropriate?

      (•) Yes ( ) No Comments:

Laboratory Data Review Checklist

Completed by:

Jennifer McLean

Title:

Associate Scientist

Date:

July 23, 2018

CS Report Name:

FIA – Fire Training Pit

Report Date:

June 18, 2018

Consultant Firm:

SLR International Corporation

Laboratory Name:

SGS Anchorage, AK

Laboratory Report Number:

K1805460

ADEC File Number:

100.38.070

Hazard Identification Number:

1. Laboratory

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

   (●) Yes ( ) No Comments:

   All analyses were conducted at ALS in Kelso, Washington. ALS is ADEC CS approved, certificate number UST-040.

   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 Comments:

   Not applicable. All analyses were conducted at ALS in Kelso, Washington.

2. Chain of Custody (COC)

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

   (●) Yes ( ) No Comments:

   The COC requested a level II deliverable data package, but the laboratory provided a level IV report. Data was not impacted.

   b. Correct analyses requested?

   (●) Yes ( ) No Comments:

   The six perfluorinated sulfonic acids and perfluorinated carboxylic acids requested were not listed on the COC. They were noted on the project bid and confirmed via email upon submittal of samples to ALS laboratory. Data was not impacted.

3. Laboratory Sample Receipt Documentation

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

   (●) Yes ( ) No Comments:

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

   (●) Yes ( ) No Comments:

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

   (●) Yes ( ) No Comments:

   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.?

   No issues were noted.

(●) Yes ( ) No Comments:

e. Data quality or usability affected?

Comments:

Data was not impacted.

4. Case Narrative

a. Present and understandable?

(●) Yes ( ) No Comments:

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

(●) Yes ( ) No Comments:

c. Were all corrective actions documented?

(●) Yes ( ) No Comments:

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

Comments:

No impact.

5. Samples Results

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

(●) Yes ( ) No Comments:

The six perfluorinated sulfonic acids and perfluorinated carboxylic acids requested were not listed on the COC. They were noted on the project bid and confirmed via email upon submittal of samples to ALS laboratory. Data was not impacted.

b. All applicable holding times met?

(●) Yes ( ) No Comments:

c. All soils reported on a dry weight basis?

(●) Yes ( ) No Comments:

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

(●) Yes ( ) No Comments:

For undetectable results, LODs were compared to 18 Alaska Administrative Code (AAC) 75 Tables B2 and C. No groundwater or soil criteria currently exist for PFCs PFHxS, PFNA, PFBS, and PFHpA.
All results of undetectable analytes had LODs at or below applicable regulatory levels.

e. Data quality or usability affected?

Comments:

No impact.

6. QC Samples

a. Method Blank

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

(●) Yes ( ) No Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

(●) Yes ( ) No Comments:

One method blank had PFHxS detection between the detection limit and limit of detection.
Two method blanks had PFNA detections between the detection limit and limit of detection.

iii. If above LOQ, what samples are affected?

Comments:

N/A

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

(●) Yes ( ) No Comments:

Batch associated samples with results within ten times that of the blank were qualified “B” for detected results greater than the blank detection, and “UB” for detected results below the blank detection (possibly false positive results).
Qualified data is shown in Table 3 of the QAR.

v. Data quality or usability affected?

Comments:

No ADEC regulatory criteria exist for PFHxS or PFNA. Data usability was not impacted.

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 Comments:

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

(●) Yes ( ) No Comments:

Not Applicable.

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

( ) Yes (●) No Comments:

For parent sample BH1-S, the MS recovery for PFOS, of 177%, exceeded the upper control limit of 150%.

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

(●) Yes ( ) No Comments:

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

Comments:

Because the LCS recovered within acceptable limits, establishing batch accuracy, only parent sample BH1-S was considered impacted.

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

(●) Yes ( ) No Comments:

The PFOS result for sample BH1-S was qualified “Q+” and should be considered an estimated value with a potential high bias.

vii. Data quality or usability affected?

Comments:

Sample BH1-S PFOS result of 0.1 mg/kg was well over the ADEC criteria of 0.003 mg/kg. All data was usable as qualified.

c. Surrogates – Organics Only

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

(●) Yes ( ) No Comments:

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

○ Yes ◉ No Comments:

For sample SS3, 13C5-PFNA surrogate recovered at 45%, below the lower control limit of 50%.

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

◉ Yes ○ No Comments:

While the surrogate recovery indicates a slightly low bias, this data also has a high bias indicated due to an associated blank detection. Contradictory flagging is considered inappropriate. Data was qualified "Q" as estimated with unknown bias.

iv. Data quality or usability affected?

Comments:

No ADEC criteria exist for PFNA. All data was considered usable as qualified.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and cooler?

◉ Yes ○ No Comments:

Field blanks were analyzed at the appropriate frequencies for all volatile analyses and PFAS.

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 Comments:

iii. All results less than LOQ?

○ Yes ○ No Comments:

Yes. Two field blanks had detections between the LOD and LOQ; one blank detection was for PFHxS, and the other was for PFOS.

iv. If above LOQ, what samples are affected?

Comments:

Allowing for reporting units, with field blanks reported in nanograms per liter (ng/L) and soil samples reported in nanograms per gram (ng/g), all associated samples had detectable results well over ten times that of the field blank detections shown.

v. Data quality or usability affected?

Comments:

No data was affected. All data was usable without qualification.

e. Field Duplicate

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

(•) Yes ( ) No Comments:

ii. Submitted blind to lab?

(•) Yes ( ) No Comments:

Soil parent sample BH1-S corresponds to duplicate BH97.
Soil parent sample BH9-D corresponds to duplicate BH98.
Soil parent sample BH2-D corresponds to duplicate BH99.
Water parent sample MW2 corresponds to duplicate MW29.

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

( ) Yes (•) No Comments:

Samples BH2-D and BH99 exceeded the 50% RPD for PFOA, RPD of 55%.

iv. Data quality or usability affected?

Comments:

Three soil field duplicate pairs were collected on June 7, 2018. Samples chronologically associated with this field duplicate pair were BH2-S, BH3-S, BH3-D, BH6-S, BH6-D, BH7-D, BH7-S, BH8-S, BH8-D, and BH9-S. PFOA results for associated samples were qualified either "Q" for detected results or "UJ" for undetectable results.
To err on the conservative, for parent sample and field duplicate pairs, the higher of the two values should be used for reporting purposes. In all cases, laboratory precision was established by either an LCS/LCSD or an MS/MSD pair with RPDs within acceptable limits, thus the impact to data was considered minimal. All data was considered usable as qualified.

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

(•) Yes ( ) No ( ) Not Applicable

i. All results less than LOQ?

(•) Yes ( ) No Comments:

Rinsate blanks had results of undetectable for all analytes.

ii. If above LOQ, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected?

Comments:

No impact.

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

a. Defined and appropriate?

(•) Yes ( ) No Comments:

Attachment 2
Laboratory Deliverables

(Data packages)

C. VENOT
B. WOELBER

6/05/2018 Fire Training Pit

1622 - Arrive Fire Trainigg Area. Begin site orientation. Tailgate Safety Meeting.

1635 - 1710 - Measure out approximate perimeter of berm crown, 200' x 200' Square. Take Site photos and GPS points.

~~1754 - End Flow~~

1710 Inspect site. Photograph site from all angles. Find one monitoring well, survey in as MW-A. Survey boundary of water ponded in FTA. Also surveyed visible stain perimeter outside of ponded water.

1810 - Call DOT operations, inform of departure from site.

1825 At Hotel - Break.

1925 - 2055 Sort samples and equipment. Place Samples from 6/5/18 in fridge.

2105 - End of day

Scale: 1 square = _____

C. VENOT / B. WOELBER

FAI FTP SITE CHAR. 6/7/19

0600 - Depart hotel

0800 - meet drillers

0900 - Tailgate Safety Meeting, plan boring locations.

0923 - Drill BH7 to 10ft bgs

0932 - PID Calibration

Pre Cal: Zero-Air = 0 ppm 100ppm = 96.8

Post Cal: Zero-Air = 0 ppm 100ppm = 99.8

0935 - Collect BH3-S 1-1.5Ft

0950 - Collect BH3-D 6-7Ft (above water) Set well point

1010 - beg. MW3 purge

1015 Drill BH2/MW2

1015 - Collect Sample BH2-S 0.75-1.25Ft

1020 - Collect Sample BH2-D @ 3-4Ft w/ Dup BH99 at "1900"

1100 - Setup on BH7. Moved to 40ft outwards from BH2 based on scale of Site and observed berm extent.

1107 - Collect Sample BH7-D @ 3.6ft above water table.

1135 - re-locate BH6 to 40' OFF corner of berm, move N. to avoid pipes above ground.

1205 - Sample BH6 for PFAS

OVER →

Scale: 1 square = _____

Rite in the Rain

C. VENOT / B. WOELBER

FAI # FTP SITE CHAR. 6/7/18

1205 BH6-S @ 1FL
1212 BH6-D @ 5-6 Ft
1225 - Re-locate BH6 to 4ft' off berm corner.
1233 - Sample BH6-S @ 1.0 Ft
1238 - Sample BH6-D @ 3.4-3.6 Ft
1258 - Drill BH10, moved 40 Ft off of BH3. corner
1255 - Sample BH3-MW3 Water
1305 - Sample ~~BH10-S~~ @ 1.1-1.2 Ft BH9-S
1307 - Sample ~~BH10-D~~ @ 3.3-3.5 Ft BH9-D
w/ DUP BH98 @ "1930" OK CV
1310 - Drill BH10 40 Ft off of corner (SW),
13 24 Sample BH10-S 1.0 Ft
13 28 Sample BH10-D 5.5-6 Ft
1320 - 1355 - Private utility locate by Star Electric for SW hole of site w/ Suspect power line + water.
1353 - BH4 64.798973 1930, -147.8801350536 1418: BH4-S 1422: BH4-D
1412 - Drill BH4 to 10 Ft. Set PVC well screen OK CV
1432 - Drill BH~~12~~ 11 Moved to corner to avoid potential water utility (three off of hydrant)

Scale: 1 square =

C. VENOT / B. WOELBER

FAI FTP SITE CHAR 11 OK CV 6/7/18

1443 - Sample BH12-S 1.0 Ft
1449 - Sample BH12-D 11 5.0-5.5 Ft
1455 - Drill BH 12
1506 - Sample BH12-S 1.0-1.25 Ft
1511 Sample BH12-D 3.7-4.0 Ft
1518 - Drill BH1/MW1
1524 - Sample BH1-S 1-1.25 w Dup BH97 (PFAS
1531 - Sample BH1-D 5.3-6.0 Ft
Liner penetrated at 1.5 Ft bgs. See photo.
1555 - Drill BH5, 1547 - Sample MW2
1603 - Sample BH5-S 1.25-1.5
1609 - Sample BH5-D 5.5-6.0 Ft.
1635 - MW1 is not producing water, remove 1" PVC well screen + install SP-16 well point to 12 Ft bgs, SP-16 screen develops well and produced adequate water for GW Sample collection.
1103 - Sample BH7-S @ 1.0 Ft 3.4ppm, Collect DRO dup BH96 @ "2050"
1732 - Sample MW1
1723 - Sample MW4
1800 Dump purge water in FTP ponded water.
1820 - Collect Field Blank 1 FB1

Scale: 1 square =

Rite in the Rain

105.00 1841 8052 C. VENT / B. WOELDER

FAI FTP SITE CHAR. 6/7/18

1800 - Collect Soil Rinse blank 1 (stainless spoon), 1810 SRB2 (acrylic liner)

1900 Depart Site

1920 at office

1920 - 2000 Break

2000 - 2230 Check Sample labels, prep Coolers / COCs for shipment

Christopher Vent 6/7/18

Scale: 1 square = _____

FAI FTP SITE CHARACTERIZATION 6/8/18

0715 C. VENT depart for office.

0755 - Prep Samples for shipment/dropoff

0805 - drop samples at SGS / ship PFAS via AIR CARGO

0820 - Inspect Liner Monitoring System.*
Hook-up peristaltic pump to existing tubing (1/4" OD HDPE). Pump pull air from tubing, no water produced.

0825 - Calibrate PID. Span Cal = 100 ppm, fresh air = 0.1 ppm.

0827 - Read air from Monitoring System with PID. Value = 3.4 ppm. Value consistent with shallow soil screening value from BH4.

* No MS1 Water Sample

0830 - Sample SW1 with peristaltic pump. No parameters collected, water is oily.

0910 - Collect SS1 1ft down berm from MS1 to evaluate upper berm concentrations. Hand-dug to 1ft bgs.

0916 - collect SS2, 1ft uphill of manhole, hand-dug 0.5ft.

09—

OVER

Scale: 1 square = _____

Rite in the Rain

105.00184.18002 C.JERNOT

FAI FTP SITE CHAR 6/8/18

0925- Collect SS3

0940- Collect Field Blank FB2
w/ PFAS-Free Water from ALS.

1000- Depart Site, return key and Gate opener.

1100-1300- Prep samples for shipment.

1300-1400- Drop Samples at SGS/AK Air Cargo.

Christine

6/8/18

Scale: 1 square = _____

Scale: 1 square = _____

SLR

Boring Log

Client / Site Name: FAT FTP SITE CHAR.	**Boring ID:** BH1 / MW1
Project # : 05.0016U.19052	Logged By: C.VENOT
Start Date/Time: 6/7/18 , 1512	Drilling Contractor: DISCOVERY
Completion Date/Time: 6/7 1518	Driller's Name (License [y/n]): SCOTT LOMBARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☒ Yes ☐ No IF YES, COMPLETE WELL LOG
	Well ID: MW1
Rig (Make/Model): Geoprobe 6712 DT	Well diameter (in): 1" Sl-16 to 5.5 Screen
Sampling Method: Macro-core	Screen Top (ft bgs): Screen Bottom (ft bgs):
Borehole diameter (in.): 2.25"	Well Type: ☒ Monitoring (temporary/permanent) ☐ Extraction
Borehole Total Depth (ft bgs): 10	Surface Completion: ☒ Stickup ☐ Flush mount
Water Level in Boring (ft bgs): 7.3 Date/Time:	Water Level in Well (ft bgs): 7.0 Date/Time: 1700

Location Information

Survey Method: Geo 7X	Location Sketch:
Survey Contractor: SLR	See GPS Data
Surveyor's Name (License [y/n]):	
Northing:	
Easting: See GPS Data	
Ground Surface Elevation:	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable)	Well Sketch
0-5		4.0			S	0-7.3 Gray, gravelly F. SAND with m-c Sand and trace Silt, Moist, dense. Liner=1.5 PID: 1.9	0.5
						3.3-3.8 Brown V. Silty F. SAND; damp, V. loose.	
						3.8-4.0 Gray F. Sand, dry, loose. PID:	
		4.0			NR	5-6.4 Same	
					D	6.4-7.3 Brown SILT w/ F. Sand, PID: 3.4 ~~Soft~~, Firm, Wet.	7.3
						7.3-9.0 Brown F. SAND with Silt, Wet, dense. PID:	
					NR	No recovery 9-10 ft. PID:	

Notes: (indicate IDW containerization and disposal methods; PID model)

1524 - Sample BH1-S @ 1-1.5 w/Dup BH97 @ "1445"

1531 - Sample BH1-D @ 5.3-6.0

SLR

Boring Log

Client / Site Name:	FAA FTP SITE CHAR.	**Boring ID:**	BH2 / MW2
Project # :	105.00194.18002	Logged By:	CVBNOT
Start Date/Time:	6/7/16 @ 1010	Drilling Contractor:	DISCOVERY
Completion Date/Time:	10/7/16 @ 1020	Driller's Name (License [y/n]):	SCOTT. LOMBARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:		Completed as Well? (X) Yes ☒ No IF YES, COMPLETE WELL LOG	
		Well ID:	MW2
Rig (Make/Model):	Geoprobe 6712 DT	Well diameter (in):	1" PVC
Sampling Method:	2.25" Macro-core	Screen Top (ft bgs): 7.02	Screen Bottom (ft bgs): 11.02
Borehole diameter (in.):	2.25"	Well Type: ☒ Monitoring (temporary/permanent) ☐ Extraction	
Borehole Total Depth (ft bgs):	10	Surface Completion: ☒ Stickup ☐ Flush mount	
Water Level in Boring (ft bgs): ~5	Date/Time: 1050	Water Level in Well (ft bgs): 10.61	Date/Time: 1500

Location Information

Survey Method:	GPS - Trimble Geo 7x
Survey Contractor:	SLR
Surveyor's Name (License [y/n])	
Northing:	—
Easting:	—
Ground Surface Elevation:	See GPS data

Location Sketch:

See GPS Data

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable).
0-5	3.4ft →		SP	BH2-S	0	0-3.2 Gray, gravelly F. SAND with trace silt, M. dense, damp (fill) PID:
			SM	BH2-D	2	3.2-3.4 Brown, Silty F. SAND, damp, dense. PID: 2.2
5-10	5ft →		SP		4	5-5.5 Brown, F. SAND with trace silt, damp, dense. Trace geotextile PID: 10.0
			ML		6	5.5-6 Gray F. Silty Sandy SILT with trace peat. Wet.
			SP SM		8	6-9 Brown F. SAND with trace Silt PID: dense, wet grading to damp.
			SM		10	9-10 brown, Silty F. SAND. Dense, damp. PID:

Well Sketch: +3.85 ft; ▽ w.l.; 11ft

Notes: (indicate IDW containerization and disposal methods; PID model)

Sample BH2-S .75-1.25ft @ 1015

BH2-D 3-4ft @ 1020

BH99 (dup) 3-4 "@ 1406"

SLR

Boring Log

Client / Site Name:	FAI FTP SITE CHAR	**Boring ID:**	BH3 / MW3
Project # :	105-00184.18002	Logged By:	C. VENOT
Start Date/Time:	06/07/17 @ 0950	Drilling Contractor:	Discovery
Completion Date/Time:	6/7 0925	Driller's Name (License [y/n]):	SCOTT LOMBARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☒ Yes ☐ No IF YES, COMPLETE WELL LOG
	Well ID: MW 3
Rig (Make/Model): GEOPROBE 6712 DT	Well diameter (in): 1" PVC
Sampling Method: 2.25" MACRO-CORE	Screen Top (ft bgs): 6ft Screen Bottom (ft bgs): 11 ft
Borehole diameter (in.): 2.25"	Well Type: ☒ Monitoring (temporary/permanent) ☐ Extraction
Borehole Total Depth (ft bgs): 10	Surface Completion: ☒ Stickup ☐ Flush mount
Water Level in Boring (ft bgs): ~7 Date/Time: 1000	Water Level in Well (ft bgs): 9.07 Date/Time: 6/7 1030

Location Information

Survey Method:	TRIMBLE GEO XT
Survey Contractor:	SLR
Surveyor's Name (License [y/n]):	
Northing:	See GPS Data
Easting:	
Ground Surface Elevation:	

Location Sketch: See GPS data

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable)	Well Sketch
0-5		3.4ft	SP	BH3-S	0	0-2.5 Gray, gravelly F. SAND with trace silt, dry, dense (FILL) 1-2ft PID: 14.7	+3.84'
3.4ft recovery					2		
			SP-SM			2.5-3.2 Brown, Silty F. SAND, damp, dense.	
			ML		4	3.2-3.4 Brown SILT with F. PID:	
				NR		Sand, hard, damp.	
5-10		4.4ft	SP-SM		6	5-9.7 Brown F. SAND with silt, damp, M. dense. PID:	
				BH3-D		~7 becomes wet	
			SP-SM		8	~8 Becomes Brown Silty F. SAND, wet, soft PID: 6-7ft 155	
						end 9.4	
				NR	10	PID:	11

Notes: (indicate IDW containerization and disposal methods; PID model)

Sample BH3-S @ 1-1.5ft -0935

BH3-D @ 6-7ft -0950

Sample MW3 Water @ 1255

12.91 - 3.84 = 9.07

SLR

Boring Log

Client / Site Name: FAI FTP SITE CHAR.	**Boring ID:** BH4 / MW4
Project #: 105.01814.10002	Logged By: C.UPMOT
Start Date/Time: 6/7/18	Drilling Contractor: DISCOVERY
Completion Date/Time: 6/7 1412	Driller's Name (License [y/n]): SCOTT LOMBARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☒ Yes ☐ No IF YES, COMPLETE WELL LOG
Rig (Make/Model): Geoprobe ~~7822~~ 6712	Well ID: MW4
Sampling Method: Macro-core	Well diameter (in): 1" PVC
Borehole diameter (in.): 2.25"	Screen Top (ft bgs): Screen Bottom (ft bgs):
Borehole Total Depth (ft bgs): 10	Well Type: ☒ Monitoring (temporary/permanent) ☐ Extraction
Water Level in Boring (ft bgs): ~~9.5~~ 5.8 Date/Time: 1410	Surface Completion: ☒ Stickup ☐ Flush mount
	Water Level in Well (ft bgs): 9.13 Date/Time: 6/7/18 1720

Location Information

Survey Method: TRIMBLE GEO 7X	Location Sketch:
Survey Contractor: SLR	
Surveyor's Name (License [y/n]):	See GPS Data
Northing: See GPS Data	
Easting:	
Ground Surface Elevation: —	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable)	Well Sketch
0-5		4.0	SP	S	0	0-Gray gravelly F-M SAND with trace silt. Moist, dense. (FILL)	+0.3
				BH4-S		PID: 2.3	
			SM		2	3.0 Brown F. SAND with silt, damp, dense.	
					4	PID:	
5-10		3.1		NR		5.0 Same as above.	
				BH4-D	6	5.8 ft - becomes wet.	
				D		PID: 3.3	
			SP		8	7.0 Gray- Brown F. SAND, wet, M. loose.	
						PID:	
				NR	10		
						PID:	

Notes: (indicate IDW containerization and disposal methods; PID model)

Sample BH4-S 1.0-1.5 @ 1418

BH4-D 5-6ft @ 1422

SLR

Boring Log Form

Client / Site Name: FAF FTP SITE CHAR.	**Boring ID:** BH5
Project # : 105.00169.18002	Logged By: CVERNOT
Start Date/Time: 6/7/18 @ 1555	Drilling Contractor: DISCOVERY
Completion Date/Time: 6/7/18 @ 1600	Driller's Name (License [y/n]): SCOTT LOMBARDO

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☐ Yes ☒ No IF YES, COMPLETE WELL LOG
Rig (Make/Model): Geoprobe 6712 DT	Well ID:
Sampling Method: 2.25" Macro-core	Well diameter (in):
Borehole diameter (in.): 2.25"	Screen Top (ft bgs): Screen Bottom (ft bgs):
Borehole Total Depth (ft bgs): 10	Well Type: ☐ Monitoring (temporary/permanent) ☐ Extraction
Water Level in Boring (ft bgs): 6.1 Date/Time: 1600	Surface Completion: ☐ Stickup ☐ Flush mount
	Water Level in Well (ft bgs): Date/Time:

Location Information

Survey Method: Trimble Geo 7X	Location Sketch:
Survey Contractor: SLR	See GPS data
Surveyor's Name (License [y/n]):	
Northing: See GPS data	
Easting:	
Ground Surface Elevation:	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency (Sample ID if Applicable)	Well Sketch
0-5		4.5	SP	BH5-S	0	0-2.4 - Gray, gravelly F. SAND with trace M. Sand and Silt, dense, damp. (FILL) PID: 1.3	
			SP-SM		2	2.4-3.2 Brown F. SAND with Silt, damp, dense.	
			OL SP-SM SP	OL SP	4	3.2-3.6 Black organic SILT with trace F. Sand and F. roots, damp, loose. PID:	
				NR		3.6 - 4.5 - Red/gray F. Sand w/ trace Silt, dense/damp.	
5-10		3.5		BH5-D	6	5-5.7 - Continues PID: 1.6	
			SP			5.7-6.1 - gray, gravelly & F. SAND with trace Silt & M-C Sand, dense, moist	
					8	6.1-8.5 - Brown F. SAND with trace Silt and wood debris from 7-7.5 ft PID:	
				NR		Mousse, wet. PID:	
					10		

Notes: (indicate IDW containerization and disposal methods; PID model)

1603 - Sample BH5-S @ 1-1.5 ft

1609 - Sample BH5-D @ 5.5-6 ft

SLR

Boring Log

Client / Site Name: FAR FTL SITE CHAR.	**Boring ID:** BH6
Project # : 105.00184.18002	Logged By: C. VERNT
Start Date/Time: 6/7/18	Drilling Contractor:
Completion Date/Time: 6/7 1156	Driller's Name (License [y/n]):

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☐ Yes ☒ No IF YES, COMPLETE WELL LOG
Rig (Make/Model): Geoprobe DT 6712	Well ID:
Sampling Method: 2.25" Macro-core	Well diameter (in):
Borehole diameter (in.): 2.25"	Screen Top (ft bgs): Screen Bottom (ft bgs):
Borehole Total Depth (ft bgs): 10	Well Type: ☐ Monitoring (temporary/permanent) ☐ Extraction
Water Level in Boring (ft bgs): 6 Date/Time: 1156	Surface Completion: ☐ Stickup ☐ Flush mount
	Water Level in Well (ft bgs): Date/Time:

Location Information

Survey Method: Geo 7X	Location Sketch:
Survey Contractor: SLR	See GPS Data
Surveyor's Name (License [y/n]):	
Northing: See GPS Data	
Easting:	
Ground Surface Elevation:	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable)	Well Sketch
0-5		3.6	SP	BH6-S	0	0-2 Gray, gravelly, F. SAND with trace silt. M. dense, moist to damp (FILL) PID: 3.3	
			SP		2	2-3.6 Brown F. SAND with trace silt, dense, damp.	
			PT/WD		4	3.6 thin peat/wood layer. PID:	
5-10		3.8	SP	BH6-D	6	5-6 Brown to gray F. SAND with trace silt and layers of organic peat/wood. M. loose, damp. PID: 8.6	
					8	6 Becomes wet ↓ same PID:	
					10	8.8 end core NR - No recovery 8.8-10 ft. PID:	

Notes: (indicate IDW containerization and disposal methods; PID model)

Collect Sample BH6-S @ 1.0 ft 1205

Sample BH6-D @ 5-6 ft 1212

SLR

Boring Log

Client / Site Name:	FAA FTP SITE CHAR.	**Boring ID:**	BH 7
Project # :	105-08/Eq. 18 Cw 2	Logged By:	C. VENCIS
Start Date/Time:	6/7/18 1103	Drilling Contractor:	DISCOVERY
Completion Date/Time:	6/7/18 1105	Driller's Name (License [y/n]):	SCOTT LOMBARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☐ Yes ☒ No IF YES, COMPLETE WELL LOG
	Well ID:
Rig (Make/Model): Geoprobe DT 6712	Well diameter (in):
Sampling Method: 2.25" Macro-Core	Screen Top (ft bgs): Screen Bottom (ft bgs):
Borehole diameter (in.): 2.25"	Well Type: ☐ Monitoring (temporary/permanent) ☐ Extraction
Borehole Total Depth (ft bgs): 10	Surface Completion: ☐ Stickup ☐ Flush mount
Water Level in Boring (ft bgs): 3.8 Date/Time: 1116	Water Level in Well (ft bgs): Date/Time:

Location Information

Survey Method: Geo 7X	Location Sketch:
Survey Contractor: SLR	
Surveyor's Name (License [y/n]):	See GIS data
Northing: — See GPS Data	
Easting: —	
Ground Surface Elevation:	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable)	Well Sketch
0-5	3.6 ft →		SP		0	0-1.4 Gray, gravelly F. SAND with trace silt, moist, m. dense. (Fill)	
			SM/ML		2	1.4 - Silty F. SAND / F. Sandy SILT with dispersed layers of organic material (brown/black), M. dense / Firm, moist to damp. Brown	
			SP	BH7-D sample → BH7-D	4	PID: 10.0	
5-10		4.5 ft	SM		6	~~3.7~~ 3.1 Brown/gray F. SAND with trace silt, dense, damp-moist. 3.7 becomes damp to wet. PID:	▼
					8	~~4.5~~ 5.0 - Brown F. SAND with Silt, loose, wet 8.25 - Gray F. Sand w/ trace Silt loose, wet. PID:	
			SP / SM / SP		10	8.25 - 8.5 Brown Silty F. SAND, loose, wet. 8.5 - 9.5 Gray F. SAND, loose, wet. PID:	

Wood debris @ 9.25 ft.

Notes: (indicate IDW containerization and disposal methods; PID model)

Sample BH7-DC 3.6 ft DRO, PFAS only 1107

BH7-S @ 1.0 ft, DRO, PFAS only, 1103

SLR

Boring Log Form

Client / Site Name: FAI FTP SITE CRAD.	Boring ID: BHB
Project #: 105.00164.18002	Logged By: C. VERNOT
Start Date/Time: 6/9/18 @ 1225	Drilling Contractor: DISCOVERY
Completion Date/Time: 6/7/18 @ 1230	Driller's Name (License [y/n]): SCOTT LANDARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☐ Yes ☒ No IF YES, COMPLETE WELL LOG
	Well ID:
Rig (Make/Model): Geoprobe 7712	Well diameter (in):
Sampling Method: Macro-core	Screen Top (ft bgs): Screen Bottom (ft bgs):
Borehole diameter (in.): 2.25"	Well Type: ☐ Monitoring (temporary/permanent) ☐ Extraction
Borehole Total Depth (ft bgs): 10	Surface Completion: ☐ Stickup ☐ Flush mount
Water Level in Boring (ft bgs): ~3.7 Date/Time: 1230	Water Level in Well (ft bgs): Date/Time:

Location Information

Survey Method: Geo 7x	Location Sketch:
Survey Contractor: SLR	
Surveyor's Name (License [y/n]):	See GPS Data
Northing: See GPS Data	
Easting:	
Ground Surface Elevation:	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable).	Well Sketch
0-5	—	3.0ft	SP	BHB-5	0	0-2.1 - Gray, gravelly, F. SAND with trace Silt, damp-moist, dense. (FILL) PID: 4.6	▽ ~5ft
				BHB-D	2	2.1-3.6+ Brown, F. SAND with trace Silt, V. dense, moist. PID: 11.8	
5-10		4.0ft		NR	4	5.0-9.0 - Brown F. SAND with trace Silt, dense, wet. PID:	
			SP		6	PID:	
				NR	8	No recovery 9-10 ft. PID:	
					10		

Notes: (indicate IDW containerization and disposal methods; PID model)

Sample BHB-5 @ 1233, 1.0ft - 1.2ft

BHB-D @ 1238, 3.4-3.6ft

SLR

Boring Log Form

Client / Site Name: FAI FTP SITE CMAR.	**Boring ID:** BH9
Project #: 105.00184.18002	Logged By: C.USSET
Start Date/Time: 6/7/18, 1300	Drilling Contractor: DISCOVERY
Completion Date/Time: 6/7/18, 1305	Driller's Name (License [y/n]): SCOTT LUMBARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☐ Yes ☒ No IF YES, COMPLETE WELL LOG
	Well ID:
Rig (Make/Model): Geoprobe 6712 DT	Well diameter (in):
Sampling Method: Macro-core	Screen Top (ft bgs): Screen Bottom (ft bgs):
Borehole diameter (in.): 2.25	Well Type: ☐ Monitoring (temporary/permanent) ☐ Extraction
Borehole Total Depth (ft bgs): 10	Surface Completion: ☐ Stickup ☐ Flush mount
Water Level in Boring (ft bgs): 4.3 Date/Time: 1300	Water Level in Well (ft bgs): Date/Time:

Location Information

Survey Method: Geo 7x	Location Sketch:
Survey Contractor: SLR	See GIS data
Surveyor's Name (License [y/n]):	
Northing: —	
Easting: — See GIS Data	
Ground Surface Elevation: —	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable).	Well Sketch
0-5		4.3 ft	SP SM/ML	BH9-S	0	0-1.1 - Brown, gravelly, F. SAND with trace Silt, M. dense, moist (Fill)	
					2	1.1-4.3 - Brown F. SAND with Silt, alternating with Silty F. SAND, M. dense/dense, Hard, damp to wet at bottom, PID: 4.7	
				BH9-D	4	PID: 7.0	▽ 4.3
5-10				NR	6	Discarded 5-10 ft, all wet PID:	
					8	PID:	
					10	PID:	

Notes: (indicate IDW containerization and disposal methods; PID model)

Sample BH9-S @ 1305, 1.1-1.2 ft
BH9-D @ 1307, 3.3-3.5 ft
BH9B @ "1930" 3.3-3.5ft (DUP)

SLR

Boring Log Form

Client / Site Name: FAA FTA SITE CHAR.	Boring ID: BH10
Project # : 105.00164.18002	Logged By: C.VERNOT
Start Date/Time: 6/7/18 1310	Drilling Contractor: DISCOVERY
Completion Date/Time: 6/7/18 1313	Driller's Name (License [y/n]): SCOTT LOMBARD

Borehole Detail

Drilling Method: ☐ HSA ☑ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☐ Yes ☒ No IF YES, COMPLETE WELL LOG
Rig (Make/Model): Geoprobe 6712	Well ID: —
Sampling Method: 2.25" Macro-core	Well diameter (in): —
Borehole diameter (in.): 2.25"	Screen Top (ft bgs): — Screen Bottom (ft bgs):
Borehole Total Depth (ft bgs): 10	Well Type: ☐ Monitoring (temporary/permanent) ☐ Extraction
Water Level in Boring (ft bgs): 6 Date/Time: 1311	Surface Completion: ☐ Stickup ☐ Flush mount
	Water Level in Well (ft bgs): Date/Time:

Location Information

Survey Method: Geo 7x	Location Sketch:
Survey Contractor: SLR	See GPS data
Surveyor's Name (License [y/n]):	
Northing: See GPS data	
Easting:	
Ground Surface Elevation:	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable)	Well Sketch
0-5	—	3.3 Ft	SP	Billo-5	0	0-1.4 Gray, gravelly, F. SAND w/ trace silt, moist-damp, M. dense. (FILL) PID: 2.0	
			SP-SM – SP –		2	1.4-3.3 - Brown, F. SAND with silt, dense, damp. 3.3 Brown, F. SAND with trace silt. dense, damp. PID:	
5-6		3.6	SW	BH10-D	4	5-6 Brown, Gravelly F-M SAND with C. Sand and trace silt, loose, damp. PID: 2.5	
			SP		6	6 - Gray, F. SAND with leases of M-C Sand, wet, loose. PID:	
			—		8	No recovery 8.6-10 PID:	
					10		

Notes: (indicate IDW containerization and disposal methods; PID model)

1324 - Sample BH10-5 1.0-1.2 Ft

1328 - Sample BH10-D 5.5-6.0 Ft

SLR

Boring Log

Client / Site Name:	FAI FTP SITE, CHAR.	**Boring ID:**	BH11
Project # :	105.00164.18062	Logged By:	C. VERNOT
Start Date/Time:	6/17/18 1432	Drilling Contractor:	DESCOVERY
Completion Date/Time:	6/17/18 1434	Driller's Name (License [y/n]):	SCOTT LOMBARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☐ Yes ☒ No IF YES, COMPLETE WELL LOG
Rig (Make/Model): Geoprobe 6712 DT	Well ID: —
Sampling Method: Macro Core	Well diameter (in): —
Borehole diameter (in.): 2.25"	Screen Top (ft bgs): — Screen Bottom (ft bgs):
Borehole Total Depth (ft bgs): 10	Well Type: ☐ Monitoring (temporary/permanent) ☐ Extraction
Water Level in Boring (ft bgs): 6.0 Date/Time: 1433	Surface Completion: ☐ Stickup ☐ Flush mount
	Water Level in Well (ft bgs): Date/Time:

Location Information

Survey Method: Geo Fx GPS	Location Sketch: See GPS Data
Survey Contractor: SLR	
Surveyor's Name (License [y/n]):	
Northing: —	
Easting: — See GPS Data	
Ground Surface Elevation: —	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description (Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable).	Well Sketch
0-5		3.4	SP/SW	BH11-S	0	0-4 - Gray, gravelly F. SAND with M-C Sand, damp, dense (FILL) PID: 1.1	
					4	PID:	
		3.0	SP	BH11-D	4	4.0-4.3 - Brown F. SAND w/ trace Silt, Damp, M. dense	
					6	5.0-8.0 Brown F. SAND with gravels (Rounded), damp, M. dense PID: 2.0 ▼ 6.0	
			SW		8	6.0-6.5 band of F-C SAND, wet	
			SP			PID:	
				NR	10	No recovery 8-10 ft PID:	

Notes: (indicate IDW containerization and disposal methods; PID model)

Sample BH12-S, 1.0-1.5 Ft @ 1443

Sample BH12-D, 5.0-5.5 Ft @ 1449

SLR

Boring Log Form

Client / Site Name: FAF FTP BASELINE CHAR	**Boring ID:** BH12
Project # :	Logged By: C. VENOT
Start Date/Time: 6/7/18 1455	Drilling Contractor: DISCOVERY
Completion Date/Time: 6/7/18 1457	Driller's Name (License [y/n]): SCOTT LOMBARD

Borehole Detail

Drilling Method: ☐ HSA ☒ Direct Push ☐ Rotary (mud/air) ☐ Sonic ☐ Other:	Completed as Well? ☐ Yes ☒ No IF YES, COMPLETE WELL LOG
Rig (Make/Model): Geoprobe 6712DT	Well ID: —
Sampling Method: Macro-core	Well diameter (in): —
Borehole diameter (in.): 2.5"	Screen Top (ft bgs): — Screen Bottom (ft bgs):
Borehole Total Depth (ft bgs): 5	Well Type: ☐ Monitoring (temporary/permanent) ☐ Extraction
Water Level in Boring (ft bgs): 5 Date/Time: 1456	Surface Completion: ☐ Stickup ☐ Flush mount
	Water Level in Well (ft bgs): Date/Time:

Location Information

Survey Method: Trimble Geo 7X	Location Sketch: See GPS Data
Survey Contractor: SLR	
Surveyor's Name (License [y/n]):	
Northing: See GPS Data	
Easting:	
Ground Surface Elevation:	

Drilling Log

GRAVEL (3 – 0.08 in)	SAND (0.08 – 0.003 in)	SILT (< 0.003 in)	CLAY (no grains visible)	HIGH ORGANIC (< 50% mineral soil)
GW GP GM GC	SW SP SM SC	ML	CL OL MH CH OH	PT

Drive Interval	Blow Counts (per 6")	Recovery (% or ft)	USCS Code	Lith Log	Depth	Description: Sample Interval - MATERIAL TYPE; color; % coarse material; % fine material; angularity of grains; moisture; sheen/stain; odor; consistency. (Sample ID if Applicable)	Well Sketch
0-5		4.0 ft	SP		0	0-3.0 - Gray, gravelly F. SAND w/ trace silt and C-M Sand, M. dense, Moist (FILL) PID:	
				BH12-S	1	1.50 - plastic FTA Liner, w/4mm thick w/ geotextile fabric PID: 3.7	
					2	PID:	
				BH12-D	3	3.0-4.0 Brown F. SAND with trace silt, dense, damp PID: 3.1	
				NR	4	No recovery 4-5 ft PID:	
					5		

Notes: (indicate IDW containerization and disposal methods; PID model) DTW at 5.0 ft estimated based on wet sampler tip.

Sample BH12-S, 1-1.25ft @ 1506

Sample BH12-D, 3.7-4.0 ft @ 1511

SLR

Soil Sampling Form

Site Name: FAI FTP SITE CHAR	**Location/Area:** FTP
Sampled By: C.VENOT	Sample ID: SS1
Approx. Air Temperature (F) 60°F	Sample Time: 0910 Sample Date: 6/8/18
Weather Conditions: Sunny	Duplicate ID: —
	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Location Information

☒ Surface ☐ Boring ☐ Test Pit (floor / sidewall) ☐ Excavation (floor / sidewall) | Sample Depth (ft bgs): 1.0

Water level Depth (ft bgs) UNK. Frozen Soil Depth (ft bgs) ND

Note- If not known at sample location, list as not determined "ND"

Sample Description - circle applicable classification(s)

GRAVEL (3 – 0.08 IN)	SAND (0.08 – 0.003 IN)	SILT (< 0.003 IN)	CLAY (NO GRAINS VISIBLE)	ORGANIC SOIL	PEAT
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT

Color _____ %Coarse _____ %Fines 25 Peat/Organic Soil Likely Present (Y/N) _____

Moisture (Dry, Moist, Wet/Saturated) Moist Stained No Odor Brown

PID 1.6 ppm ☒ Headspace ☐ In-Sampler ☐ In-Situ

Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable
(VOCs)		(DRO/RRO)		(RCRA Metal)			
~~BTEX~~		(PAHs)		Lead (only)			
(GRO)		~~PCBs~~		PFAS			

Equipment Used: PID/FID(Model\SN) MINI RAE Collection Method _____

Notes/Comments (indicate general location, and possible other relevant conditions not listed above):

Gradelly brown SAND (F-M) with C. Sand and trace Silt, Moist, M. dense. No sheen/odor.

Site Name: FAI FTP	**Location/Area:** FTP
Sampled By: SITE CHAR.	Sample ID: SS2
Approx. Air Temperature (F) 60F	Sample Time: 0916 Sample Date: 6/8/18
Weather Conditions: Part Sunny	Duplicate ID: —
	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Location Information

☒ Surface ☐ Boring ☐ Test Pit (floor / sidewall) ☐ Excavation (floor / sidewall) | Sample Depth (ft bgs): 0.5 ft

Water level Depth (ft bgs) 0.5 Frozen Soil Depth (ft bgs) ND

Note- If not known at sample location, list as not determined "ND"

Sample Description - circle applicable classification(s)

GRAVEL (3 – 0.08 IN)	SAND (0.08 – 0.003 IN)	SILT (< 0.003 IN)	CLAY (NO GRAINS VISIBLE)	ORGANIC SOIL	PEAT
GW GP GM GC	(SW) SP SM SC	ML MH	CL CH	OL/OH	PT

Color Dk. Brown %Coarse 95 %Fines 25 Peat/Organic Soil Likely Present (Y/N) N

Moisture (Dry, Moist, Wet/Saturated) Wet Stained Yes Odor Diesel

PID 27.7 ppm ☒ Headspace ☐ In-Sampler ☐ In-Situ

Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable
VOCs		DRO/RRO		RCRA Metal 5			
~~BTEX~~		PAHs		~~Lead (only)~~			
GRO		~~PCBs~~		PFAS			

Equipment Used: PID/FID(Model\SN) _____ Collection Method _____

Notes/Comments (indicate general location, and possible other relevant conditions not listed above):

Gradually Gray-brown SAND (F-M) with C. Sand and trace Silt, damp to wet, M/loose. Sheen/Staining and strong hydrocarbon odor.

(SW)

SLR

Soil Sampling Form

Site Name: FAT FID SITE CHAR	**Location/Area:** FTP
Sampled By: CVENOT	Sample ID: SS3
Approx. Air Temperature (C) 60F	Sample Time: 0925 Sample Date:
Weather Conditions: Part Cloudy.	Duplicate ID: —
	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Location Information

☐ Surface ☐ Boring ☐ Test Pit (floor / sidewall) ☐ Excavation (floor / sidewall) | Sample Depth (ft bgs):

Water level Depth (ft bgs)_____ Frozen Soil Depth (ft bgs)_____

Note- If not known at sample location, list as not determined "ND"

Sample Description - circle applicable classification(s)

GRAVEL (3 – 0.08 IN)	SAND (0.08 – 0.003 IN)	SILT (< 0.003 IN)	CLAY (NO GRAINS VISIBLE)	ORGANIC SOIL	PEAT
GW GP GM GC	(SW) SP SM SC	ML MH	CL CH	OL/OH	PT

Color DK Brown-gray %Coarse 95 %Fines ≤5 Peat/Organic Soil Likely Present (Y/N) N

Moisture (Dry, Moist, Wet/Saturated) Moist-wet Stained yes Odor Diesel

PID 7.5 ppm ☐ Headspace ☐ In-Sampler ☐ In-Situ

Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable
VOCs		DRO/RRO		RCRA Metal			
BTEX		PAHs		Lead (only)			
GRO		PCBs					

Equipment Used: PID/FID(Model\SN)_____ Collection Method_____

Notes/Comments (indicate general location, and possible other relevant conditions not listed above):

Same as SS2, (SW)

Site Name:	**Location/Area:**
Sampled By:	Sample ID:
Approx. Air Temperature (C)	Sample Time: Sample Date:
Weather Conditions:	Duplicate ID:
	MS/MSD ☐ Yes ☐ No Trip Blank Required: ☐ Yes ☐ No

Location Information

☐ Surface ☐ Boring ☐ Test Pit (floor / sidewall) ☐ Excavation (floor / sidewall) | Sample Depth (ft bgs):

Water level Depth (ft bgs)_____ Frozen Soil Depth (ft bgs)_____

Note- If not known at sample location, list as not determined "ND"

Sample Description - circle applicable classification(s)

GRAVEL (3 – 0.08 IN)	SAND (0.08 – 0.003 IN)	SILT (< 0.003 IN)	CLAY (NO GRAINS VISIBLE)	ORGANIC SOIL	PEAT
GW GP GM GC	SW SP SM SC	ML MH	CL CH	OL/OH	PT

Color_____ %Coarse_____ %Fines_____ Peat/Organic Soil Likely Present (Y/N)_____

Moisture (Dry, Moist, Wet/Saturated)_____ Stained_____ Odor_____

PID_____ppm ☐ Headspace ☐ In-Sampler ☐ In-Situ

Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable	Analyses	Check Applicable
VOCs		DRO/RRO		RCRA Metal			
BTEX		PAHs		Lead (only)			
GRO		PCBs					

Equipment Used: PID/FID(Model\SN)_____ Collection Method_____

Notes/Comments (indicate general location, and possible other relevant conditions not listed above):

SLR

Groundwater Sampling Form

Site/Client Name:	FAI FTP SITE CHAR.	**Well ID:**	MW1
Project # :	105.00104.18002	Sample ID:	MW1
Sampled By:	C. VENOT	Sample Time:	1732 Sample Date: 6/7/18
Weather Conditions:	Part Cloudy	Duplicate ID:	—
Sampling Method: ☐ Low Flow ☒ Other Purge		MS/MSD ☐ Yes ☒ No	Trip Blank Required: ☒ Yes ☐ No

Well Information

Well Type: ☐ Permanent ☒ Temporary	Well Diameter 1/2 in.	Screen Interval: 8 ft BGS to 12 ft BGS
Well Condition: ☒ Good ☐ Fair ☐ Poor (if fair or poor explain in Notes)		Stickup ☒ Yes ☐ No; If yes, 0.50 ft above ground

Gauging/Purging Information

Depth to Water (ft ~~BTOC~~):	7.0	Tubing/Pump Depth (ft. BTOC):	
Total Depth (ft BTOC):	~11.0	Purge Start Time (24-hr)	1650
Depth to Product (ft. BTOC)	—	Purge End Time (24-hr)	1720
Product Thickness (ft)	—	Total Purge Time (min)	30

LOW FLOW: **Max Draw Down** = (Tubing Depth – Top of Screen Depth)_____ X 0.25 = _____(ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.;

Min. purge volume if required: purge volume (gal) = volume of water/ft_____(gal/ft) X Water column thickness_____(ft) X # of casing volumes_____ =_____gal

Well Diameter – gal/ft	1" – 0.041 gal/ft	2" – 0.163 gal/ft	4" – 0.653 gal/ft	6" – 1.469 gal/ft

Water Quality Parameters

(Achieve stable parameters for 3 consecutive reading, 4 parameters if practical [each reading taken after pumping a minimum of 1 flow through cell volume])

Time (24-hr)	Flow Rate ~~Milliliter/~~mL minute)	Purge Volume ~~(gal)~~ L	Temp (°C) (± 3 %)	Specific Conductance (µS/cm°) (± 3%)	DO (mg/L) (± 10%)	pH (± 0.1)	ORP (mV) (± 10mV)	Turbidity (NTU) (± 10%, or <5 NTU)	DTW ✓ (ft BTOC)	Drawdown (ft) (Max___ft)
1702	—	8L	5.23	1265	6.20	6.57	57.6	Met.	NM	NM
1705	~600	8.25	5.25	1260	4.55	6.52	49.5	136		
1714	~600	13.5	5.24	1260	4.51	6.53	48.7	86		
1717	~400	14.75	5.23	1260	4.41	6.52	48.0	34		
1720	~350	15.5	5.40	1260	4.38	6.52	47.2	20		
Parameter Stable (Check applicable)			◯	✓	✓	✓	✓	◯	—	—

Sample Color: Clear **Sample Odor:** none **Sheen:** none

Analytical Sampling

Analyses	Check Applicable	Comments
DRO/RRO		PFAS
GRO		
VOCs		
RCRA Metals		

Notes: 1650 - 1702 - well development purge of 6L, SP-16 well point
1702 - 1720 - Sample purge
* Const Measure DTW in SP-16 well screen

Equipment: Pump Type Peristaltic Tubing (Type/Length) HDPE/PTFE Bailer Type —
Water Level Meter Durham geo slope Multi-Parameter Meter (Make/SN#) YSI 556
Turbidity Meter (Make/SN#) LaMotte Filter Lot #
SP-16 well screen, 1/2" ID casing
Purge Water Handling: ☒ Discharged to surface ☐ Containerized ☐ Treated (how?) w/in FTP liner

BGS = Below Ground Surface, BTOC= Below Top of Casing, NA = Not Applicable

SLR

Groundwater Sampling Form

Site/Client Name: FAI Fire Training Site	**Well ID:** MW4
Project #: 105.01284.18002	Sample ID: ~~BH4~~ MW4
Sampled By: B. Woelber	Sample Time: 1723 Sample Date: 6/7/18
Weather Conditions: sunny	Duplicate ID: —
Sampling Method: [X] Low Flow [ ] Other_____	MS/MSD [ ] Yes [X] No Trip Blank Required: [X] Yes [ ] No

Well Information

Well Type: [ ] Permanent [X] Temporary	Well Diameter 1 in.	Screen Interval: _____ ft BGS to _____ ft BGS
Well Condition: [X] Good [ ] Fair [ ] Poor (if fair or poor explain in Notes)		Stickup [X] Yes [ ] No; If yes, 0.3 ft above ground

Gauging/Purging Information

Depth to Water (ft BTOC): 9.43 − 0.30 = 9.13	Tubing/Pump Depth (ft. BTOC): 10.00
Total Depth (ft BTOC): 10.00	Purge Start Time (24-hr) 16:31 (Development), 17:06
Depth to Product (ft. BTOC) —	Purge End Time (24-hr) 17:06 (Development)
Product Thickness (ft)	Total Purge Time (min)

LOW FLOW: **Max Draw Down** = (Tubing Depth – Top of Screen Depth)_____ X 0.25 = _____(ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.;

Min. purge volume if required: purge volume (gal) = volume of water/ft _____(gal/ft) X Water column thickness_____(ft) X # of casing volumes_____ =_____gal

Well Diameter – gal/ft	1" – 0.041 gal/ft	2" – 0.163 gal/ft	4" – 0.653 gal/ft	6" – 1.469 gal/ft

Water Quality Parameters

(Achieve stable parameters for 3 consecutive reading, 4 parameters if practical [each reading taken after pumping a minimum of 1 flow through cell volume])

Time (24-hr)	Flow Rate (liter/ minute)	Purge Volume ~~(gal)~~ L	Temp (°C) (± 3 %)	Specific Conductance (µS/cm°) (± 3%)	DO (mg/L) (± 10%)	pH (± 0.1)	ORP (mV) (± 10mV)	Turbidity (NTU) (± 10%, or <5 NTU)	DTW (ft BTOC)	Drawdown (ft) (Max___ft)
17:08		6	6.12	859	4.53	6.77	45.7	—	9.75	0.32
17:12		6.5	6.14	865	4.49	6.75	44.9	—	9.75	0.32
17:14		7	6.06	847	4.35	6.74	45.0	—	9.75	0.32
17:17		7.5	5.97	850	4.36	6.74	46.2	—	9.72	0.29
17:20		8	6.10	852	4.36	6.74	46.2	—	9.73	0.30
Parameter Stable (Check applicable)			✓	✓	✓	✓	✓	—	✓	✓

Sample Color: Clear	**Sample Odor:** none	**Sheen:** none

Analytical Sampling

Analyses	Check Applicable	Comments
PFAS		PFAS
VOC, 6 RO		
DRO/RRO		
RCRA METALS		

Notes: 1" PVC Screen, 0.010-slot.
5 liters purged as part of development by 17:06

Equipment: Pump Type geopump (peri) Tubing (Type/Length) poly/teflon Bailer Type —
Water Level Meter Slope Indicator Multi-Parameter Meter (Make/SN#) YSI 556 MPS
Turbidity Meter (Make/SN#) — Filter Lot # —

Purge Water Handling: [X] Discharged to surface [ ] Containerized [ ] Treated (how?)_____

BGS = Below Ground Surface, BTOC= Below Top of Casing, NA = Not Applicable

SLR

Groundwater Sampling Form

Site/Client Name: FAI Fire Training Pit	**Well ID:** ~~BH3~~ BH2/MW2
Project # :	Sample ID: MW2
Sampled By: B. Wheeler	Sample Time: ~~MW2 1215~~ Sample Date: 6/7/18
Weather Conditions: Sunny	Duplicate ID: MW29 1930
Sampling Method: ☒ Low Flow ☒ Other Switch to 3 volume	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Well Information

Well Type: ☐ Permanent ☒ Temporary	Well Diameter 1 in.	Screen Interval: _____ ft BGS to _____ ft BGS
Well Condition: ☒ Good ☐ Fair ☐ Poor (if fair or poor explain in Notes)		Stickup ☒ Yes ☐ No; If yes, 3.85 ft above ground

Gauging/Purging Information

Depth to Water (ft BTOC): 13.46	Tubing/Pump Depth (ft. BTOC): 14.87
Total Depth (ft BTOC): 14.87	Purge Start Time (24-hr) 13:30 (Development), 15:06 (Purge)
Depth to Product (ft. BTOC) —	Purge End Time (24-hr) 15:00 (Development),
Product Thickness (ft) —	Total Purge Time (min) 45 hour 90 min,

LOW FLOW: **Max Draw Down** = (Tubing Depth – Top of Screen Depth)_____ X 0.25 = _____(ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.:

Min. purge volume if required: purge volume (gal) = volume of water/ft_____(gal/ft) X Water column thickness_____(ft) X # of casing volumes_____ =_____gal

Well Diameter – gal/ft	1" – 0.041 gal/ft	2" – 0.163 gal/ft	4" – 0.653 gal/ft	6" – 1.469 gal/ft

Water Quality Parameters

(Achieve stable parameters for 3 consecutive reading, 4 parameters if practical [each reading taken after pumping a minimum of 1 flow through cell volume])

Time (24-hr)	Flow Rate (liter/ minute)	Purge Volume ~~(gal)~~ L	Temp (°C) (± 3 %)	Specific Conductance (µS/cm°) (± 3%)	DO (mg/L) (± 10%)	pH (± 0.1)	ORP (mV) (± 10mV)	Turbidity (NTU) (± 10%, or <5 NTU)	DTW (ft BTOC)	Drawdown (ft) (Max____ft)
1506		24	6.27	1.560	4.42	6.52	82.0	—	13.97	0.51
1512		25	5.19	1.551	4.25	6.48	77.1	—	13.87	0.41
1517		26	4.75	1.549	2.33	6.44	74.9	—	13.85	0.39
1520		27	4.68	1.555	2.05	6.45	71.8	—	13.89	0.43
1523		28	4.62	1.559	1.93	6.45	69.3	—	13.91	0.45
1526		29	4.71	1.554	2.31	6.46	68.5	—	13.93	0.47
Parameter Stable (Check applicable)			✓	✓		✓	✓			

Sample Color:	**Sample Odor:**	**Sheen:**

Analytical Sampling

Analyses	Check Applicable	Comments

Notes: Begin well development @ 13:30
Primary sample MW2 @ 1547, Dup MW29 @ 1930

Equipment: Pump Type geopump 2 (peri) Tubing (Type/Length) poly and teflon Bailer Type —
Water Level Meter GeoSlope Indicator Multi-Parameter Meter (Make/SN#) YSI 556 MPS
Turbidity Meter (Make/SN#) — Filter Lot # —

Purge Water Handling: ☒ Discharged to surface ☐ Containerized ☐ Treated (how?)_____

BGS = Below Ground Surface, BTOC= Below Top of Casing, NA = Not Applicable

13.46 – 3.85 = 10.61 ft

SLR

Groundwater Sampling Form

Site/Client Name: FAI Fire Training Pit	**Well ID:** BH3 / MW3
Project # :	Sample ID: MW3
Sampled By: B. Woelber	Sample Time: 1255 Sample Date: 6/7
Weather Conditions: Sunny	Duplicate ID: —
Sampling Method: ☒ Low Flow ☒ Other Switch to 3 volumes	MS/MSD ☐ Yes ☒ No Trip Blank Required: ☒ Yes ☐ No

Well Information

Well Type: ☐ Permanent ☒ Temporary	Well Diameter 2 in.	Screen Interval: _____ ft BGS to _____ ft BGS
Well Condition: ☒ Good ☐ Fair ☐ Poor (if fair or poor explain in Notes)		Stickup ☒ Yes ☐ No; If yes, 3.34 ft above ground

Gauging/Purging Information

Depth to Water (ft BTOC): 12.91	Tubing/Pump Depth (ft. BTOC): 14.91
Total Depth (ft BTOC): 14.91	Purge Start Time (24-hr) 1030 (development) 1140 (purge)
Depth to Product (ft. BTOC) —	Purge End Time (24-hr) 1108 (development)
Product Thickness (ft) —	Total Purge Time (min) 30 m (development)

LOW FLOW: **Max Draw Down** = (Tubing Depth – Top of Screen Depth)_____ X 0.25 = _____(ft); if screen interval is not known or water table is below top of screen, then use default value of 0.3 ft.;

Min. purge volume if required: purge volume (gal) = volume of water/ft_____(gal/ft) X Water column thickness_____(ft) X # of casing volumes_____ =_____gal

Well Diameter – gal/ft	1" – 0.041 gal/ft	2" – 0.163 gal/ft	4" – 0.653 gal/ft	6" – 1.469 gal/ft

Water Quality Parameters

(Achieve stable parameters for 3 consecutive reading, 4 parameters if practical [each reading taken after pumping a minimum of 1 flow through cell volume])

Time (24-hr)	Flow Rate (liter/ minute)	Purge Volume ~~(gal)~~ Liters	Temp (°C) (± 3 %)	Specific Conductance (µS/cm°) (± 3%)	DO (mg/L) (± 10%)	pH (± 0.1)	ORP (mV) (± 10mV)	Turbidity (NTU) (± 10%, or <5 NTU)	DTW (ft BTOC)	Drawdown (ft) (Max____ft)
11:44	0.25	11	8.61	1.544	9.2	6.59	83.9	—	13.49	0.58
11:48	0.25	12	6.31	1.548	6.9	6.52	87.1	—	13.43	0.52
11:52	0.25	13	6.27	1.563	6.2	6.46	87.2	—	13.40	0.49
11:55	0.25	14	6.35	1.558	6.0	6.49	84.5	—	13.43	0.52
Parameter Stable (Check applicable)			✓	✓	✓	✓	✓			

Sample Color: clear **Sample Odor:** — **Sheen:** none

Analytical Sampling

Analyses	Check Applicable	Comments

Notes: 10 liters purged during well development

Equipment: Pump Type geopump 2 (peri) Tubing (Type/Length) poly Bailer Type —

Water Level Meter Geo Slope Indicator Multi-Parameter Meter (Make/SN#) YSI 556 MPS

Turbidity Meter (Make/SN#) — Filter Lot # —

Purge Water Handling: ☒ Discharged to surface ☐ Containerized ☐ Treated (how?)_____

BGS = Below Ground Surface, BTOC= Below Top of Casing, NA = Not Applicable

Water Parameter Meter Calibration Log

SLR

Date: 6/6/18 Time: 9:46 Calibration By: B. Woelber

Meter Manufacturer and Identification #: YSI 556 MPS

Parameter	Standard	True Value	Lot #	Date Opened	Expiration Date	PreCalibration Reading	Reading After Calibration	Calibration Acceptance Criteria
pH	7.00	7.01	UW1	7/10/2017	4/2018	6.93	7.01	± 0.10
	4.00	4.00	US1	7/10/2017	8/2018	4.17	4.00	± 0.10
	10.00	10.18	~~UW1~~ UU2	7/10/2017	6/2018	10.08	10.18	± 0.10
Sp Cond (mS/cm)	1.413	1.278	UW1	7/10/2017	4/2018	1.327 ~~1.276~~ BW	1.278	± 10%
ORP (mV)	240					—	BUMP	----------
DO*	741.3 mm Hg					92.5	97.5	± 2%

If parameter not included in sampling event, fill in box with NA (not applicable)

* Note that the True Value for DO is dependent on pressure and altitude; reference the DO Calibration Table

Date: 6/7/18 Time: 9:41 Calibration By: B. Woelber

Meter Manufacturer and Identification #: YSI 556 MPS

Parameter	Standard	True Value	Lot #	Date Opened	Expiration Date	PreCalibration Reading	Reading After Calibration	Calibration Acceptance Criteria
pH	7.00	7.02	UW1	7/10/2017	4/2018	7.08	7.02	± 0.10
	4.00	4.00	US1	7/10/2017	8/2018	3.95	4.00	± 0.10
	10.00	10.08	UU2	7/10/2017	6/2018	10.10	10.08	± 0.10
Sp Cond (mS/cm)	1.413	1.225	UW1	7/10/2017	4/2018	1.298 ~~1.225~~ BW	1.225	± 10%
ORP (mV)	240					—	BUMP	----------
DO*	742.1					91.3	98.6	± 2%

If parameter not included in sampling event, fill in box with NA (not applicable)

* Note that the True Value for DO is dependent on pressure and altitude; reference the DO Calibration Table

Date: _____ Time: _____ Calibration By: _____

Meter Manufacturer and Identification #: _____

Parameter	Standard	True Value	Lot #	Date Opened	Expiration Date	PreCalibration Reading	Reading After Calibration	Calibration Acceptance Criteria
pH	7.00							± 0.10
	4.00							± 0.10
	10.00							± 0.10
Sp Cond (mS/cm)	1.413							± 10%
ORP (mV)	240							----------
DO*								± 2%

If parameter not included in sampling event, fill in box with NA (not applicable)

* Note that the True Value for DO is dependent on pressure and altitude; reference the DO Calibration Table

Photo 1: Fire Training Pit (FTP) area and associated features, view to east (June 5, 2018).

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SITE PHOTOGRAPHS 2018	Job No: 105.00184.18002

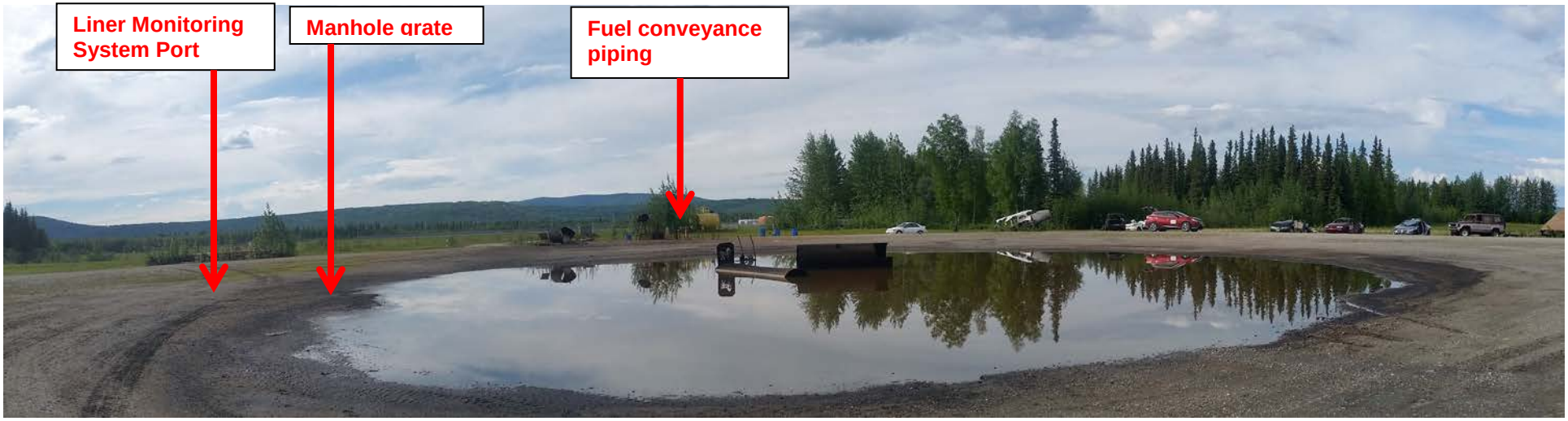

Photo 2: Fire Training Pit area and associated features, view to north east (June 5, 2018).

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SITE PHOTOGRAPHS 2018	Job No: 105.00184.18002

Photo 3: Purging soil gas from liner monitoring system sample port to south of the FTP pond (June 7, 2018).

Photo 4: Liner system manhole grate along north edge of FTP pond (June 5, 2018)

Photo 5: Fuel conveyance piping and flow meter to the north of the FTP pond (June 5, 2018).

Photo 6: Fuel tank pump electric control panel, view to south east (June 5, 2018).

Photo 7: Diesel supply tank for FTP, view to north (June 5, 2018).

Photo 8: FTP diesel pump kill switch, view to east (June 5, 2018)

Photo 9: Unknown monitoring well “MW-A” located to the north of the FTP pond (June 5, 2018).

Photo 10: Drilling perimeter boring location BH8 near cars and an airplane fuselage used for rescue training, view to north (June 7, 2018).

Photo 11: Boring BH1 0 to 4 foot (ft) soil core with FTP liner components visible at approximately 1.5 ft below ground surface (June 7, 2018).

Photo 12: Temporary well BH3 during groundwater sample purge, view to southeast (June 7, 2018).

Photo 13: Surface water sampling of the FTP pond using a peristaltic pump (June 8, 2018).

Photo 14: Surface soil sample SS1 collection adjacent to liner monitoring port, view to northeast (June 8, 2018).

Photo 15: Surface soil sample SS2 located in stained soil adjacent to FTP manhole (June 8, 2018).

Photo 16: Field equipment rinsate sample collection from acetal Macro Core drill liner (June 7, 2018).

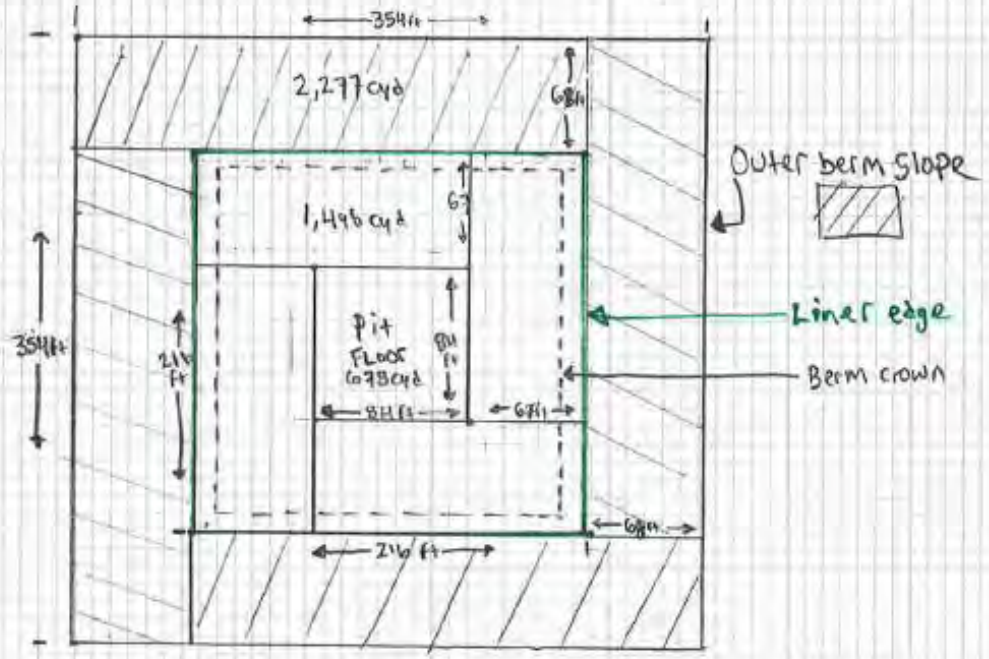
By C.VENDT Date 8/13/18 Project FIRE TRAINING PIT SITE CHARACTERIZATION Project No. 105.00184.18002
Checked By SF Date 8/13/18 Subject AS-BUILT WASTE SOIL VOLUME CALCULATIONS Sheet 1 of 2

OUTER BERM VOLUME - AS-BUILT = 9,110 CYD

1. Average berm area (ref. Figure 4): $\frac{251\ sq\ ft + 183\ sq\ ft}{2} = 215\ sq\ ft$
2. Average berm Slope Width (ref. Figure 4): $\frac{79\ ft + 56\ ft}{2} = 68\ ft$
3. Berm length (each side) = outer berm length − Slope width: 354ft − 68ft = 286ft
4. Berm Volume = 4 x volume of each berm side = $215\ sq\ ft \cdot 286\ ft \cdot \frac{1\ cy}{27\ sq\ ft} = 2,277\ cy$
   4 x 2,277 cy = 9,110 cy

INNER BERM/PIT VOLUME = 5,982 + 678 cy = 6,660 CYD

1. Average berm area (ref fig 4): $\frac{279\ sq\ ft + 262\ sq\ ft}{2} = 271\ sq\ ft$
2. Average berm Slope width (ref. Figure 4): $\frac{67\ ft + 67\ ft}{2} = 67\ ft$
3. Berm length (each side) = Liner Width − Slope width = 216ft − 67ft = 149ft
4. Berm Volume = 4 x Volume of each berm side = $271\ sq\ ft \cdot 149\ ft \cdot \frac{1\ cy}{27\ sq\ ft} = 1,496\ cy$
   4 x 1,496 cy = 5,982 cy
5. Pit floor Volume = floor width x area (ref Fig 4) = $84\ ft \cdot 218\ sq\ ft \cdot \frac{1\ cy}{27\ sq\ ft} =$
   = 678 CYD



SLR	Fairbanks International Airport 2018 Fire Training Pit Site Characterization Fairbanks, Alaska
Waste Volume Calculations	Job No: 105.00184.18002

By C.VENDT Date 8/13/18 Project FIRE TRAINING PIT SITE CHARACTERIZATION Project No. 105.00184.18002
Checked By SF Date 8/23/18 Subject FIELD-MEASUREMENT WASTE VOLUME CALCULATIONS Sheet 2 of 2

OUTER BERM VOLUME - FIELD MEASURED = 8,197 cyd

1. Average berm area (ref. figure 7): $\frac{191 sqft + 236 sqft}{2} = 212 sqft$
2. Average berm slope width (ref. fig 7): $\frac{44 ft + 47 ft}{2} = 46 ft$
3. Berm length (each side) = Outer berm length - Slope width: 307 ft - 46 ft = 261 ft
4. Berm Volume = 4 x Volume of each berm side = 261 ft · 212 sqft · $\frac{1 cyd}{27 sqft}$ = 2,049 cyd

   4 x 2,049 = 8,197 cyd

INNER BERM/PIT VOLUME = 5,067 cyd + 694 cyd = 5,761 cyd

1. Average berm area (ref. figure 7): $\frac{191 sqft + 265 sqft}{2} = 228 sqft$
2. Average berm slope width (ref. Fig 7): $\frac{75 ft + 56 ft}{2} = 66 ft$
3. Berm length (each side) = outer berm length - slope width = 216 ft - 66 ft = 150 ft
4. Berm Volume = 4 x Volume of each side: 228 sqft · 150 ft · $\frac{1 cyd}{27 sqft}$ = 1,267 cyd

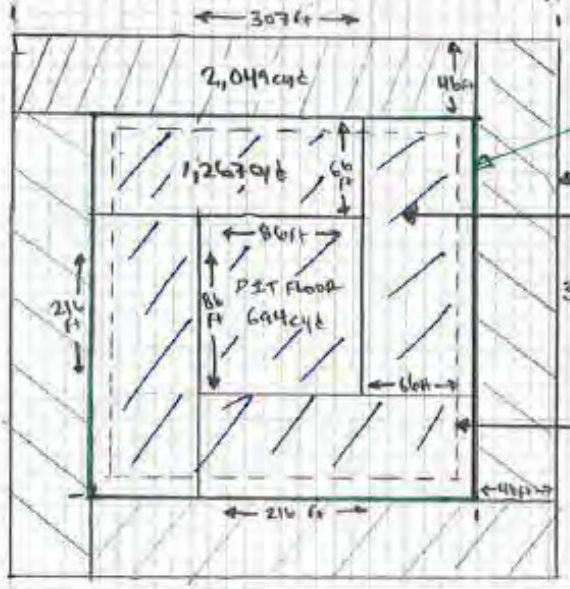
   4 x 1,267 cyd = 5,067 cyd
5. Pit Fill Volume = Floor width · area (ref figure 7) = 86 ft · 218 sqft · $\frac{1 cy}{27 sqft}$ = 694 cyd

PONDED WATER VOLUME = 190,583 gal

1. Volume = area x length (assume square) = 149 Sq ft · 171 ft · $\frac{7.48 gal}{1 sqft}$ = 190,583 gal

SATURATED SOIL RECOVERABLE WATER VOLUME = 169,964 gal

1. Volume of Saturated Soils = Area x Width = 153 sqft · 190 ft = 86,070 cuft · $\frac{1 cyd}{27 sqft}$ = 3,188 cyd
2. Volume of Water = Soil Volume · Porosity = 86,070 cuft · 0.33[A] · $\frac{7.48 gal}{1 cuft}$ = 212,455 gal



3. Recoverable Volume: assume 20% residual Saturation: 212,455 gal · (1 - 0.20) = 169,964 gal

A. Average Value for well-graded Sand (SW) from Das, B., Advanced Soil Mechanics. Taylor & Francis, London & New York, 2008.

SLR	Fairbanks International Airport 2018 Fire Training Pit Site Characterization Fairbanks, Alaska
Waste Volume Calculations	Job No: 105.00184.18002