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FINAL

CLASS V INJECTION WELL CLOSURE WORK PLAN  
Cordova Airport ARFF Building  
CORDOVA, ALASKA

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Submitted To: PDC, Inc. Engineers  
1028 Aurora Drive  
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Subject: FINAL CLASS V INJECTION WELL CLOSURE WORK PLAN, CORDOVA  
AIRPORT ARFF BUILDING , CORDOVA, ALASKA

The services we propose in this Work Plan are on behalf of PDC, Inc. Engineers for the Alaska Department of Transportation & Public Facility (DOT&PF). The services proposed in this Work Plan describe the plan for characterization and closure of two Class V Industrial Injection Wells associated with the Cordova Airport Aircraft Rescue and Fire Fighting Building.

Our Scope of Services was specified in our proposal dated December 16, 2020 and approved by Amendment 4 of our professional services agreement. We recommend DOT&PF submits this Work Plan to the Alaska Department of Environmental Conservation (DEC) and to the U.S. Environmental Protection Agency.

This Work Plan was prepared and review by:

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Role: Author

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Associate  
Role: Project Manager

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## ACRONYMS

AAC	Alaska Administrative Code
ARFF	Aircraft Rescue and Firefighting
bgs	below ground surface
CDV	Merle K (Mudhole) Smith Airport
COPC	contaminant of potential concern
CSM	Conceptual Site Model
CUL	cleanup level
DEC	Alaska Department of Environmental Conservation
DOT&PF	Alaska Department of Transportation & Public Facilities
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
GRO	gasoline range organics
IDW	investigative-derived waste
mg/kg	milligram per kilogram
PAH	polycyclic aromatic hydrocarbons
PDC	PDC, Inc. Engineers
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
POC	point of contact
ppm	parts per million
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RRO	residual range organics
SDWA	Safe Drinking Water Act
SGS	SGS North America, Inc.
SREB	Snow Removal Equipment Building
SSHP	Site Safety and Health Plan
SVOC	semi-volatile organic compound
TCLP	toxicity characteristic leaching procedure
UIC	underground injection control
VOC	volatile organic compound

# 1 INTRODUCTION

Exhibit 1-1: Site Information	
Facility Name	Cordova Airport Aircraft Rescue and Fire Fighting Building
Facility Owner	DOT&PF, 2301 Peger Road, Fairbanks, Alaska 99709
Physical Location/Address	Milepost 13 Copper River Highway, Cordova, Alaska
Contaminated Sites Program File Number	Not applicable
Number of Injection Wells	2
Injection Well Label & Status	CR-ARFF-1 (Active) and CR-ARFF-2 (Active)
Qualified Environmental Professionals (18 AAC 75.333[b] and 18 AAC 78.088[b])	Valerie Webb, Tiffany Green, Rachel Willis, Dana Fjare
Field Work Dates	Anticipated for March 2021

The Alaska Department of Transportation and Public Facilities (DOT&PF) operates an Aircraft Rescue and Fire Fighting (ARFF) Building at the Merle K. (Mudhole) Smith Airport (CDV) in Cordova, Alaska (Figure 1). This building contains two Underground Injection Control (UIC) Class V industrial injection wells and is slated for demolition in 2021. This work plan provides general guidance for characterization and in-place closure of the UIC Class V industrial injection wells. The Cordova Airport ARFF Building (ARFF Building) and injection wells will be demolished, and associated contaminated soil from multiple sources excavated, at a later date as part of a separate contract. Furthermore, demolition and excavation specifications will be provided in our final report to the contractor, PDC Inc. Engineers (PDC).

Shannon & Wilson prepared this work plan in general accordance with Alaska Department of Environmental Conservation's (DEC) March 2017 *Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites* and DEC's October 2019 *Field Sampling Guidance* document.

This Work Plan also includes a Site Safety and Health Plan (SSHP). Shannon & Wilson will also follow their internal *Guidance for Field Work During the COVID-19 Pandemic* (April 2020) and the Alaska DOT&PF *COVID-19 Management Plan* (April 2020) guidelines for field work conducted during the COVID-19 pandemic (Appendix A).

## 1.1 Site Description

The CDV is located east of the community of Cordova, Alaska at Mile 13 of the Copper River Highway (60.4933 North, 145.4683 West). Cordova is located at the southeastern end

of the Prince William Sound in the Gulf of Alaska near the mouth of the Copper River. The airport is located within Section 7 and 18, Township 16 South, Range 1 West, and Section 12, Township 16 South, Range 2 West, Copper River Meridian. Access to the community is only by air and sea. A map of the general vicinity is presented in Figure 1. A map of the project location is presented in Figure 2.

## 1.2 Background and Previous Investigations

### 1.2.1 Injection Well Classification Correspondence

Beginning in 1999, the U.S. Environmental Protection Agency (EPA) implemented UIC regulations that required owners of facilities to either permit or close Class V injection wells if they discharge into the subsurface. The purpose of the UIC regulations is to protect underground sources of drinking water under the Safe Drinking Water Act (SDWA). At the ARFF Building, DOT&PF constructed dry-well floor drains designed to catch incidental rainwater and snowmelt from vehicles which is then discharged directly to the subsurface. The building is only used for vehicle and equipment storage, not for vehicle maintenance or training activities.

In August 2009, DOT&PF submitted the *Response to EPA Information Request, DOT&PF Northern Region* in response to a request by EPA for information related to the SWDA. The ARFF Building is detailed on page 135 of the aforementioned document. Details regarding the ARFF Building injection wells are presented in Section 2, Exhibit 2-1.

In February 2013, EPA issued a Notice of Intent related to the continued use of Class V motor vehicle waste disposal injection wells at the Northern Region Maintenance Stations. This document lists the two ARFF Building dry-well floor drains as motor vehicle waste disposal injection wells. In March 2013, DOT&PF issued comments and questions related to the Notice of Intent, which requested the ARFF Building be removed from the list as a motor vehicle waste disposal well as the building is not used for vehicle maintenance. In response, EPA clarified that if the dry wells do not qualify as motor vehicle waste disposal injection wells, they would still be classified as Class V industrial injection wells that require further investigation. The dry-well floor drains at the ARFF Building are not included in the September 2013 Consent Agreement and Final Order issued to the DOT&PF Northern Region.

### 1.2.2 Cordova Airport ARFF Building

In January 2020, PDC contracted Shannon & Wilson to perform a hazardous materials assessment and subsurface investigation at the ARFF Building. The ARFF Building will be demolished and replaced with a new Combined Maintenance Facility that will include a



Snow Removal Equipment Building (SREB) and an ARFF Building that will occupy the same location.

In July 2020, Shannon and Wilson conducted a hazardous materials assessment in the ARFF building and SREB footprint on behalf of our client, PDC. The hazardous materials assessment noted the presence of two floor-drains suspected to be injection wells of dry-well construction. The dry-well floor drains were not investigated further at this time.

In January 2021, PDC contracted Shannon & Wilson to characterize the two Class V industrial injection wells in the ARFF Building in addition to other environmental and geotechnical services not related to the injection wells.

### 1.2.3 Potential Sources of Contamination

Analytical results from the July 2020 soil sampling show DEC Cleanup Level (CUL) exceedances for multiple analytes surrounding the ARFF building. Fuel-related contaminants were detected in the vicinity of the out-of-use buried heating oil tank. These contaminants were not detected in soil samples collected elsewhere around the ARFF Building. Perfluorooctanesulfonic acid (PFOS) was reported to be present in all but one of the soil samples collected; it was reported above CUL in one surface-soil sample and two soil boring samples. The full horizontal and vertical extent of contamination is not known at this time and will be investigated concurrent with the characterization of the two Class V industrial injection wells.

A historical spill report was submitted to DEC upon discovery of contamination at the site. The report is being review by DEC and has not yet been transferred to the contaminated sites division.

The DEC Contaminated Sites database lists 5 FAA locations within 500 feet of the ARFF related to excavation of multiple gasoline and heating oil tanks in 1994. The sites are listed as “cleanup complete” or “cleanup complete with institutional controls” (DEC File Number 2215.38.001; Hazard IDs 2604, 2079, 2078, 1853, and 2081).

## 1.3 Objectives and Scope of Services

The objective is to characterize and request closure of two floor-drain dry wells classified as Class V industrial injection wells at the Cordova Airport ARFF Building. The characterization of the injection wells and subsurface contamination, if present, will provide the basis for specifications detailing demolition and excavation activities, which will be submitted with our report. Characterization activities related to other sources of

contamination will be presented in a separate work plan and conducted concurrently with injection well characterization and closure activities.

The scope for this injection well characterization effort includes:

- Submitting a Pre-Closure Notification (Form 7520-17) to EPA;
- Advancing one boring within each floor-drain dry well; and
- Collecting two analytical soil samples from each boring: one at the depth of discharge, and one from the groundwater interface.

The floor drain locations are presented on Figure 2.

## 1.4 Project Team

Chris Darrah is Shannon & Wilson’s Principal-in-Charge. Valerie Webb is Shannon & Wilson’s Project Manager and site safety officer, coordinating Shannon & Wilson’s field activities and maintaining safe work practices. Tiffany Green will provide assistance with the Class V Industrial Injection Well characterization and closure request and coordinate with DOT&PF and regulatory agencies. Shannon & Wilson’s project team also includes other State of Alaska Qualified Environmental Professionals to support the various field and reporting tasks. The project team and their responsibilities are summarized in Exhibit 1-2 below.

**Exhibit 1-2: Project Team**

Affiliation	Responsibility	Representative	Contact Number
DOT&PF	Owner	Lauren Staft, PE	(907) 451-5424
	Client – Regional POC, Environmental	Sam Myers	(907) 451-5291
	Client – Statewide PFAS POC	Sammy Cummings	(907) 888-5671
PDC, Inc. Engineers	Client	William Hrinko, PE	(907) 222-1112
DEC	Regulatory agency POC	Bill O’Connell	(907) 269-3057
Shannon & Wilson	Principal-in-charge	Chris Darrah, CPG, CPESC	(907) 458-3143
	Project Manager	Valerie Webb	(907) 458-3152
	Injection Well Characterization	Tiffany Green	(907) 458-3153
Eurofins TestAmerica, Sacramento	PFAS analytical laboratory services	David Alltucker	(916) 374-4383
SGS North America, Inc.	Analytical laboratory services	Jennifer Dawkins	(907) 474-8656
Discovery Drilling	Soil borings	Keeter Brown & DJ Wardwell	(907) 344-6431

POC = point of contact

## 1.5 Project Schedule

Once EPA approval is received for the proposed injection well closure activities outlined in this Work Plan, Shannon & Wilson will coordinate with DOT&PF staff to begin the field effort. Field activities are tentatively scheduled for March 2021, weather permitting and freight availability. This schedule is subject to change following guidance by the U.S. Centers for Disease Control and Prevention, Alaska Department of Health and Social Services, the City of Cordova regarding the COVID-19 pandemic, and badging requirements at the CDV.

Laboratory analysis will be requested on a standard 14-day turn-around time. After field work is complete, an Injection Well Characterization and Closure Report will be prepared documenting the results of the sampling event. The report will include summarized field observations, analytical results with a discussion of data quality, photo documentation, figures showing sample locations, description of deviations from the approved Work Plan, if any, and conclusions and recommendations. The report will also include an updated CSM.

We understand that our client, PDC, will be submitting 100% design specifications to DOT&PF to support the SREB renovation project on April 1, 2021.

## 2 INJECTION WELL INFORMATION

Two Class V industrial injection wells, CR-ARFF-1 and CR-ARFF-2, are located within the Cordova Airport ARFF Building. Both injection wells are concrete dry-well floor drains that open and discharge directly to the subsurface (Figure 3). See Exhibit 2-1 for further site and injection well information.

Exhibit 2-1: Site Information	
Type of Injection Well	Concrete dry-well floor drains classified as Class V industrial injection wells
Estimated Length of Piping	Per as-builts, no piping is associated with the injection wells
Potential Fluids	Incidental rainwater and snowmelt from vehicle storage. Vehicle maintenance was not performed in this building.
Connection Status	Active; the building will be in use until demolition
Contamination Present	Unknown at IW location; no previous investigations
Potential On-site Contributing Factors	PFAS contamination Releases related to the building's underground heating oil storage tank Refer to Section 1.2.3
Depth to Groundwater	Approximately 7.5 feet below ground surface (bgs)
Groundwater Flow Direction	Highly variable and localized due to the silty sands and gravels from glacial outwash. Anticipated to generally range from west-southwest to south-southwest.
On-site Wells	One onsite well for potable water in the ARFF Building.
Groundwater Contamination	None known.
Groundwater Protection Area	There is a groundwater protection area to the northwest of the site for the protection of an Alaska Airlines groundwater well.
Potential Receptors	There are multiple groundwater wells at the Cordova Airport in the anticipated up- and cross-gradient directions.

### 3 CONTAMINANTS OF POTENTIAL CONCERN AND REGULATORY LEVELS

Contaminants of potential concern (COPCs) associated with the products and wastes potentially discharged to the industrial injection wells are gasoline range organics (GRO); diesel range organics (DRO); residual range organics (RRO); polynuclear aromatic hydrocarbons (PAHs); volatile organic compounds (VOCs); semivolatile organic compounds (SVOCs); PFAS compounds PFOS and perfluorooctanoic acid (PFOA), and metals. In addition, soil samples will be collected and held for Toxicity Characteristic Leaching Procedure (TCLP) analysis pending preliminary metals results. The TCLP results, if needed, will be used to characterize soil for appropriate disposal under Federal and State regulations. Exhibit 3-1 summarizes the COPCs for the site.

Cordova has an annual average precipitation of 92 inches per year (Western Region Climate Center). To evaluate analytical data, soil results will be compared to 18 Alaska Administrative Code (AAC) 75.341 Tables B1 Method Two—Migration to Groundwater and B2, Method Two—Over 40-Inch Zone—Migration to Groundwater.

**Exhibit 3-1: Soil and Water COPCs and Laboratory Reporting Limits**

Method	Analyte	Soil CULs <sup>a</sup> (mg/kg)	Soil LODs/RLs <sup>c</sup> (mg/kg)
<b>PFAS Analytes</b>			
537.1 or 537.1M <sup>d</sup>	PFOS	0.003	0.0002
	PFOA	0.0017	0.0005
	PFOS+PFOA	-	-
<b>Petroleum Analytes</b>			
AK101	GRO	260	1.25
AK102	DRO	230	10
AK103	RRO	22,000	50
<b>VOC Analytes</b>			
EPA 8260	multiple		
<b>PAH Analytes</b>			
EPA 8270D-SIM	multiple		
<b>SVOC Analytes</b>			
EPA 8270D	multiple		
<b>Metal Analytes</b>			
EPA 6020B	Arsenic	0.2	0.31
	Barium	2,100	0.094
	Cadmium	9.1	0.062
	Chromium	100,000	0.13
	Lead	400 <sup>b</sup>	0.062
	Mercury	0.36	0.01
	Selenium	6.9	0.31
	Silver	11	0.15

Notes:

- a. 18 AAC 75 Table B2. Method Two - Petroleum Hydrocarbon Soil Cleanup Levels – Over 40-Inch Zone - Migration to Groundwater or Table B1. Method Two - Soil Cleanup Levels Table - Migration to Groundwater.
- b. 18 AAC 75.341 Table B1 Method Two – Soil Cleanup Levels Table – Human Health Over 40-Inch Zone.
- c. February 2020 LODs from SGS North America, Inc. for petroleum and PAH analyses. February 2020 RLs from Eurofins TestAmerica, Sacramento for PFAS analyses.
- d. All available PFAS analytes will be requested for analytical reports. However, only PFOS and PFOA have a DEC drinking water action level or cleanup levels and are reported in this table.

DRO = diesel range organics; EPA = U.S. Environmental Protection Agency; GRO = gasoline range organics; LOD = limit of detection, mg/kg = milligram per kilogram; PAH = polynuclear aromatic hydrocarbons; PFAS = per- and polyfluoroalkyl substances; PFOA = perfluorooctanoic acid PFOS = perfluorooctanesulfonic acid; RL = reporting limit; RRO = residual range organics; SIM = selective ion monitoring; SVOC = semi-volatile organic compounds; VOC = volatile organic compounds

In addition to the UIC-well regulations, sites at which contaminants are present in soil or groundwater are subject to DEC discharge reporting and cleanup regulations (18 AAC 75, Article 3).

## 4 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) describes potential pathways between a contaminant source and possible receptors (i.e., people, animals, and plants) and is used to determine who may be at risk of exposure to those contaminants. A DEC Human Health CSM Graphic Form and Human Health CSM Scoping Form was updated based on our understanding of site conditions in July 2020. These forms are included in Appendix B of this Work Plan.

Very little is known about potential per- and polyfluoroalkyl substances (PFAS) -affected media. The draft CSM will be revised and presented in the final report following receipt of analytical data. Potentially affected media include contaminated soil, groundwater, and surface water. Potential human exposure pathways include:

- incidental soil, groundwater, or surface water ingestion;
- dermal absorption of contaminants from soil, groundwater, or surface water;
- ingestion of fugitive dust; and
- ingestion of ground water (i.e., water supply wells).

We do not include wild or farmed foods or direct contact of contaminants in sediment as the scope of our CSM is limited to the vicinity of the future SREB building and not a CSM for the entire CDV.

## 5 SAMPLING AND ANALYSIS PLAN

Shannon & Wilson will contract Discovery Drilling to perform subsurface-soil sampling. The following subsections describe sample-collection and analytical methods.

### 5.1 Soil Borings

Because they are inside the ARFF garage and surrounded by a concrete slab floor, we will drill soil borings directly through each of the two floor drains. The drilling contractor will use their rig equipped with MC5 tooling to collect subsurface soil samples from the borings. The Macro-Core®, typical of direct-push tooling, is a solid barrel (2.125-inch outside diameter) direct-push device for collecting continuous core samples (1.5-inch-diameter) of unconsolidated materials at depth. The Geoprobe Macro-Core system advances 5-foot-long

polyvinyl chloride (PVC)-lined samplers for continuous soil sampling. Discovery Drilling personnel will cut open the PVC liner to allow examination, field-screening, and sampling of the soil core. A new, clean Macro-Core® liner will be used for each section of the boring to prevent cross contamination.

## 5.2 Soil-Sample Collection

We will collect soil samples for field-screening and potential laboratory analysis generally at 2.5-foot-depth intervals, beginning at the base of each injection well and extending to the groundwater interface. We will field-screen the soil samples using a photoionization detector (PID) and select samples for laboratory analysis based from the base of the injection well (end-point sample) and at the groundwater interface. Soil samples will be submitted for the analysis of GRO, DRO, RRO, VOCs, SVOCs, PFAS, and metals. 10-percent of all soil samples will also be submitted for PAHs; additional site characterization not related to the injection wells will be conducted concurrently with the injection well samples. Additionally, we will collect required quality control (QC) samples in accordance with DEC's *Field Sampling Guidance*.

Shannon & Wilson's experienced field professional (a DEC-qualified sampler) will observe and log the soil borings, describe samples in the field based on observations, collect samples for potential laboratory analysis, and prepare a descriptive log of soil conditions encountered during sample retrieval. Soil descriptions will be summarized on the Field Log of Boring.

Samples will be collected using a new stainless-steel spoon, after which we will quickly place the soil into new, laboratory-supplied jars appropriate for the analysis to be performed. Soil to be analyzed for GRO and VOCs can be placed in the same jar. For GRO/VOC analysis, an aliquot of methanol (provided by the laboratory) will be placed in the pre-weighed sample jar with about 30 grams of soil. Field staff will make sure the jar rims and threads are free of soil particles to ensure a good seal, quickly sealing the jars. We will label sample jars in the field, using permanent waterproof ink, with the following information: a unique sample number, date and time of sampling, initials of collector, laboratory analysis, and preservation method. No additional label may be added to the GRO/VOC jars because they are pre-weighed at the analytical laboratory. Soil to be analyzed for DRO and RRO can be placed in the same jar. If there is not sufficient soil volume to fill each of the jars, the available soil will be divided among the jars. The soil sample and duplicate sample with the highest PID reading at the site will be submitted for PAH analysis.

Upon completion of the logging and sample collection, the drilling contractor will backfill the boreholes with soil not selected for laboratory analysis, if the soil's PID results do not exceed 20 parts per million (ppm). If PID results exceed 20 ppm, the soil not selected for laboratory analysis will be managed as described in Section 5.8; the driller will fill the borehole with clean sand or pea gravel, sealed within 2 feet of the ground surface with at least 6 inches of hydrated bentonite chips, and topped with clean cuttings, sand, pea gravel, or topsoil. If the boring penetrates asphalt, the driller will patch the asphalt with cold-patch and compact it using hand tools or vehicle tires.

### 5.3 Field Screening

Shannon & Wilson's field personnel will utilize a hand-held MiniRae 3000 PID manufactured by Rae Systems, Inc., as the field-screening tool.

The PID measures total volatile compounds present as vapors, as a semi-quantitative indication of hydrocarbons present. The MiniRae provides a three-second response time up to 10,000 ppm. The detector will be calibrated daily, or more often as needed, to a 100-ppm isobutylene standard according to manufacturer's instructions. Shannon & Wilson field personnel are trained and experienced in calibration, operation, routine maintenance, and troubleshooting of the PID, as well as interpretation of PID results.

We will perform initial field-screening of the soil by moving the probe of the PID slowly above and along the exposed core/split-spoon sample (at about one foot per five seconds), noting locations of elevated readings. At locations of elevated PID readings, field staff will perform PID field-screening on soil samples after collection using the procedures in the DEC *Field Sampling Guidance for Contaminated Sites and Leaking Underground Storage Tanks* (2019), summarized below.

Field staff will collect headspace samples using a clean, stainless-steel spoon from freshly uncovered soil and place the soil in a clean, sealable plastic bag, filling it one-third to one-half full, quickly sealing it closed. Field staff will allow the headspace to develop in the bag by warming it to at least 40° Fahrenheit for 10 minutes to one hour, shaking for 15 seconds at the beginning and end of the period to assist volatilization. Field staff will open the bag just enough to allow insertion of the PID probe about one-half the headspace depth, taking care to avoid uptake of water droplets and soil particles. We will record the highest PID reading obtained, noting any erratic meter response at high-organic-vapor concentrations or conditions of elevated headspace moisture.



## 5.4 Analytical Laboratories and Methods

The GRO, DRO, RRO, VOCs, SVOC, PAH, and metals (with enough volume for additional TCLP analysis, if needed) soil samples will be submitted to SGS North America, Inc. in Anchorage, Alaska. The PFAS soil, water, and sediment samples will be submitted to Eurofins TestAmerica of Sacramento, California. Based on the DEC Technical Memorandum issued on October 2, 2019, PFAS analysis will report the 18 PFAS compounds defined in the EPA Method 537.1. Other analytical samples will be submitted for the analyses listed in Exhibit 5-1.

### Exhibit 5-1: Analytical Sample Summary

Matrix	Location Type	PFAS (EPA 537.1 or 537.1M)	GRO, DRO, RRO, VOCs (AK101, AK102, AK103, EPA 8260D)	PAH (EPA 8270D- SIM)	SVOCs (EPA 8270D)	Metals (EPA 6020B)
Soil	Injection Well Soil	4 + 1 DUP	4 + 1 DUP	1	4 + 1 DUP	4 + 1 DUP

**Notes:**

DUP = field duplicate samples; PFAS = per- and polyfluoroalkyl substances; EPA = U.S. Environmental Protection Agency; GRO = gasoline range organics; DRO = diesel range organics; RRO = residual range organics; PAH = polynuclear aromatic hydrocarbons; SIM = selective ion monitoring; SVOC = semi-volatile organic compound; VOC = volatile organic compound

\*Surface soil samples will also be collected from soil borings.

Laboratory QC samples are not included in these totals. Tables assumes all potential samples will be collected.

## 5.5 Sample Containers, Preservation, and Holding Times

Prior to field-sampling efforts, Shannon & Wilson will request necessary sample containers and laboratory-prepared trip blanks from SGS. The containers will be prepared by the laboratory according to the analysis method. The containers will not be opened until samples are to be collected.

Sample containers, preservation, and holding times are shown in Exhibit 5-2. Chemical preservatives will be added to the sample containers by the laboratory performing the analyses. Samples will be placed in an insulated cooler containing frozen ice-substitute immediately after collection.

**Exhibit 5-2: Sample Containers, Preservation, and Holding Times**

Analyte	Method	Media	Container and Sample Volume	Preservation	Holding Time
PFAS	EPA 537.1 or 537.1M	Soil	2 x 250 mL polycarbonate	0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
GRO	AK101	Soil	Pre-weighed 4-oz amber glass jar with septa	25mL MeOH 0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
DRO	AK102	Soil	4-oz amber glass jar	0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
RRO	AK103	Soil	4-oz amber glass jar	0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
VOCs	EPA 8260D	Soil	Pre-weighed 4-oz amber glass jar with septa	25mL MeOH 0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
PAHs	EPA 8270D SIM	Soil	4-oz amber glass jar	0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
SVOCs	EPA 8270D	Soil	4-oz amber glass jar	0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
Metals	EPA 6020B	Soil	4-oz amber glass jar	0 °C to 6 °C	180 days

Notes:

°C = degrees Celsius; DRO = diesel range organics; EPA = U.S. Environmental Protection Agency; GRO = gasoline range organics; MeOH = methanol; oz = ounce; PAH = polynuclear aromatic hydrocarbons; PFAS = per- and polyfluoroalkyl substances; RRO = residual range organics; SIM = selective ion monitoring, SVOC= semi-volatile organic compound; VOA = volatile organic analysis; VOC = volatile organic compound

## 5.6 Sample Custody, Storage, and Transport

After collection, we will wrap the samples in bubble wrap and place them in a hard plastic cooler with adequate quantities of frozen gel ice to maintain sample temperatures between 0 °C and 6 °C until the samples reach the laboratory, using packing material as necessary to prevent bottle breakage. A “temperature blank” will be packed with the samples in each cooler. We will maintain custody of the samples at all times prior to submitting them to the laboratory for analysis. At the end of each field day, if not transported to the laboratory, field personnel will maintain samples in a secure area at the jobsite.

We will complete COC records at the time each cooler is packed; we will place the COC records in plastic bags taped to the inside lid of the cooler. The COC records document sample possession from the point of collection to the time of receipt by the laboratory sample-control center. We will keep a copy of the COC records to allow sample accountability between field and laboratory.

## 5.7 Equipment Decontamination

All reusable equipment introduced into a soil boring must be decontaminated prior to use and reuse. The driller will decontaminate their drilling tools using a dry decontamination method.

## 5.8 Investigation-Derived Waste Management

Investigation-derived waste (IDW) will consist of soil cuttings, well development and purge water, decontamination rinsate water, and disposable sampling equipment.

Soil cuttings from each boring will be bagged and labeled with unique identifying information. The bags will be stored in a supersack on site to meet Alaska DOT shipping requirements and closed to prevent rain or snowmelt infiltration. Each supersack will be labeled with unique identifying information and stored on site. The appropriate soil disposal method will be selected to meet State and Federal requirements following the receipt of soil analytical results.

Other IDW will primarily consist of disposable sampling equipment (nitrile gloves, pump tubing, etc.). These items will be disposed of at an onsite dumpster and ultimately the Cordova Landfill.

# 6 QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) presents the quality assurance (QA) and QC activities designed to achieve data quality goals for this project. The QAPP is intended to guide activities during assessment and review of resulting data. Shannon & Wilson will be responsible for conducting sampling, data reduction, and reporting under this QAPP.

QA is defined as the total integrated program for assuring reliability of screening and measuring data. QC is defined as the routine use of procedures to effectively achieve defined goals and standards for sampling and analysis. This section describes specific procedures to be followed during sampling at the site, so sampling and documentation are effective, laboratory data are usable, and the information acquired is of high quality and reliable.

## 6.1 Quality-Assurance Objectives

For measurement data, the QA objective is to assure environmental-monitoring data are of known and acceptable quality. For analytical data, the objective is to meet acceptable QA standards of precision, accuracy, representativeness, comparability, and completeness.

Numeric QA objectives for this project are presented in Exhibit 6-1. The rationale for the QA program is to plan sampling, sampling locations, number of samples to be collected, frequency and timing of sampling, and sampling techniques, so the data are representative of environmental conditions at the project site. Comparability among samples will be maintained by consistency in sampling procedures, sample-preservation methods, analytical methods, and data-reporting units. QA objectives will meet DEC limits; numerical reporting limit goals for this project will be less than DEC soil-cleanup levels.

**Exhibit 6-1: Quality Assurance Objectives for Analytical Samples<sup>1</sup>**

Analyte	Method	Matrix	Precision	Accuracy	Completeness
PFAS	EPA 537.1 <sup>2</sup>	Soil	±50%	(analyte dependent)	85%
GRO	AK101	Soil	±50%	60-120%	85%
DRO	AK102	Soil	±50%	60-120%	85%
RRO	AK103	Soil	±50%	60-120%	85%
VOCs	EPA 8260D	Soil	±50%	(analyte dependent)	85%
PAHs	8270D-SIM	Soil	±50%	(analyte dependent)	85%
SVOCs	EPA 8270D	Soil	±50%	(analyte dependent)	85%
Metals	EPA 6020B	Soil	±50%	(analyte dependent)	85%

Notes:

COPC = contaminant of potential concern; DRO = diesel range organics; EPA = U.S. Environmental Protection Agency; GRO = gasoline range organics; PAH = polynuclear aromatic hydrocarbons; PFAS = per- and polyfluoroalkyl substances; RRO = residual range organics; SIM = selective ion monitoring; SVOC = semi-volatile organic compound; VOC = volatile organic compound

## 6.2 Field Documentation

Sample identification numbers (sample ID) will consist of unique identification numbers. Field personnel will enter the sample ID and corresponding sample location (boring or monitoring-well number) in the Sample Collection Log to indicate where the samples were collected.

We will use field-log sheets (Appendix C) to record field documentation, including the following:

- sampling team member(s);
- weather and other salient observations;
- documentation of instrument calibration;
- location of activity and site conditions;
- field observations and comments;

- changes to sampling protocol;
- sample ID;
- sample date and time;
- site photographs;
- site sketches;
- location of sampling points; and
- distances to nearest permanent site features.

All information will be recorded in permanent ink. Deletions will be crossed out with one line, initialed, and dated.

COC records will accompany samples to the laboratory. The forms will be signed by persons collecting, handling, or delivering samples to the laboratory; delivery dates and times will also be recorded. The laboratory personnel receiving the samples will sign the forms and record the date and time. The original forms will accompany the shipment; we will retain a copy in project records.

### 6.3 Field-Instrument Calibration

Equipment and instrument calibration assures accurate and reliable measurements are obtained. Calibration will be conducted using the manufacturer's recommended calibration procedures. We will calibrate the PID each day they will be used and adjust them to operate within manufacturer specifications, prior to use in the field. Calibration results, as well as any instrument maintenance and error messages, will be recorded in a designated logbook kept with the instrument. We will charge the PID battery prior to use and clean the lamp regularly, in accordance with manufacturer instructions.

### 6.4 Field QC Samples

The field QA/QC program for this project includes the collection of the following QA/QC samples, as described below.

#### 6.4.1 Field-Duplicate Samples

We will collect duplicate samples at a minimum rate of 10 percent of the samples submitted for analysis over the entire project, i.e., a minimum of one per every 10 field samples for each matrix sampled, and for each target analyte, with a minimum of one. Additional site characterization activities will occur concurrent with the injection well characterization and closure activities. If possible, we will collect duplicates from locations most likely to be contaminated based on PID results, since calculation of duplicate precision is not possible

for samples with contaminants below detection limits. We will assign duplicates a separate sample number and submit them “blind” to the laboratory. We will use duplicate sample results to test the comparability of analytical data.

#### 6.4.2 Trip-Blank Samples

For soil samples, we will use trip blanks to detect and quantify potential organic chemical cross-contamination among samples or originating from an outside source. These containers will be transported to the sampling location and returned to the laboratory in the cooler used to transport the project samples. The trip blank will be analyzed for GRO and VOCs using the same analytical method as project samples. The concentration of any artifact found in the trip blank will be noted and compared to soil-sample results.

#### 6.4.3 Temperature Blanks

Temperature blanks, while not QC samples *per se*, enable the receiving laboratory to estimate samples’ temperature on their arrival at the laboratory. Temperature blanks will consist of a jar filled with water and packed with the other samples in each cooler. The water temperature in the blank will be measured at the laboratory. The sample temperature should be within a range of 0 °C to 6 °C. The laboratory will document sample and cooler conditions, including temperature, and whether any sample containers are broken.

### 6.5 Laboratory QC Samples

The analytical laboratory will perform QC measurements to determine the precision and accuracy of the entire measurement system, including initial and continuing calibration checks, analysis of method blanks, analysis of spiked samples, duplicate analyses, and evaluation of surrogate-analyte recoveries. Surrogate-recovery data will be presented with the results of all applicable samples. The laboratories will apply their in-house procedures for QC reporting.

### 6.6 Laboratory Data Deliverables

Shannon & Wilson will request Level 2 Data Deliverables and Electronic Data Deliverables from the analytical laboratories for transmittal with the report.

### 6.7 Data Reduction, Evaluation, and Reporting

The project manager will review field data, including sample descriptions and pertinent observations. Data-evaluation procedures will include QA checks to see holding times have been met, duplicate samples have been collected, and checks for other QA parameters have been performed. We will also complete the DEC laboratory data-review checklists as part of

our data-review process. The Shannon & Wilson project manager will check field data during preparation of the report.

Laboratory tests will be validated by the laboratory supervisor or other responsible party and include evaluation for precision and accuracy of the data set. The laboratory QC officer or other responsible party will review and sign analytical data before release. Data reporting will be completed in the laboratory reports submitted to Shannon & Wilson. Individual laboratory reports will be included with the final report. We will check analytical data generated by the laboratory for precision, accuracy, and completeness.

We will prepare a report documenting field activities on the project and presenting analytical results in tabular form. The report will summarize results of sampling, evaluating those results in the context of DEC cleanup and screening levels. We will provide conclusions and recommendations. We will include laboratory data reports, DEC laboratory data-review checklists, copies of COC records, and copies of our field notes with the report. We will provide a discussion of the extent of contamination at the site and surrounding area and recommendations for additional investigation, corrective action, or monitoring, as appropriate.

## 7 REFERENCES

- Alaska Department of Environmental Conservation (DEC), 2019a, 18 AAC 75, Oil and Other Hazardous Substances Pollution Control: Juneau, Alaska, Alaska Administrative Code (AAC), Title 18, Chapter 75, January available:  
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- Alaska Department of Environmental Conservation (DEC), 2019b, 18 AAC 75.345, Groundwater Cleanup Levels: Juneau, Alaska, Alaska Administrative Code (AAC), Title 18, Chapter 75, Section 341, January, available:  
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Alaska Department of Environmental Conservation (DEC), 2017, Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites: Juneau, Alaska, DEC Division of Spill Prevention and Response, Contaminated Sites Program, March, available:  
[http://dec.alaska.gov/spar/csp/guidance\\_forms/csguidance.htm](http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm).

Shannon & Wilson, Inc., 2020 Cordova Airport Combined Maintenance Facility Draft 2020 Hazardous Materials Assessment Report: Report prepared by Shannon & Wilson Inc., Fairbanks, 103311-001, for PDC Engineers, Inc., Fairbanks, Alaska. October 2020.



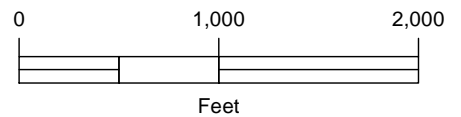


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**LEGEND**

● Project Location

▭ Project Area



Cordova Airport ARFF Building  
Injection Well Closure Work Plan  
Cordova, Alaska

**CORDOVA AIRPORT VICINITY MAP**

February 2021

103311-008

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**Figure 1**






Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

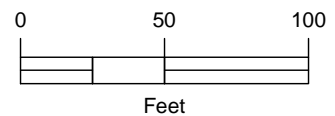
**LEGEND**

**Existing Features**

-  ARFF Water Supply Well
-  Injection Well (Active)
-  Aircraft Rescue and Fire Fighting Building
-  Aboveground Storage Tank
-  Underground Heating Oil Tank

**Proposed Construction**

-  Future Structures
-  Utility Excavation
-  Proposed Driveway



Cordova Airport Combined Maintenance Facility  
2021 Site Characterization Work Plan  
Cordova, Alaska


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**SITE MAP**

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February 2021 103311-008

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 **SHANNON & WILSON, INC.**  
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS **Figure 2**

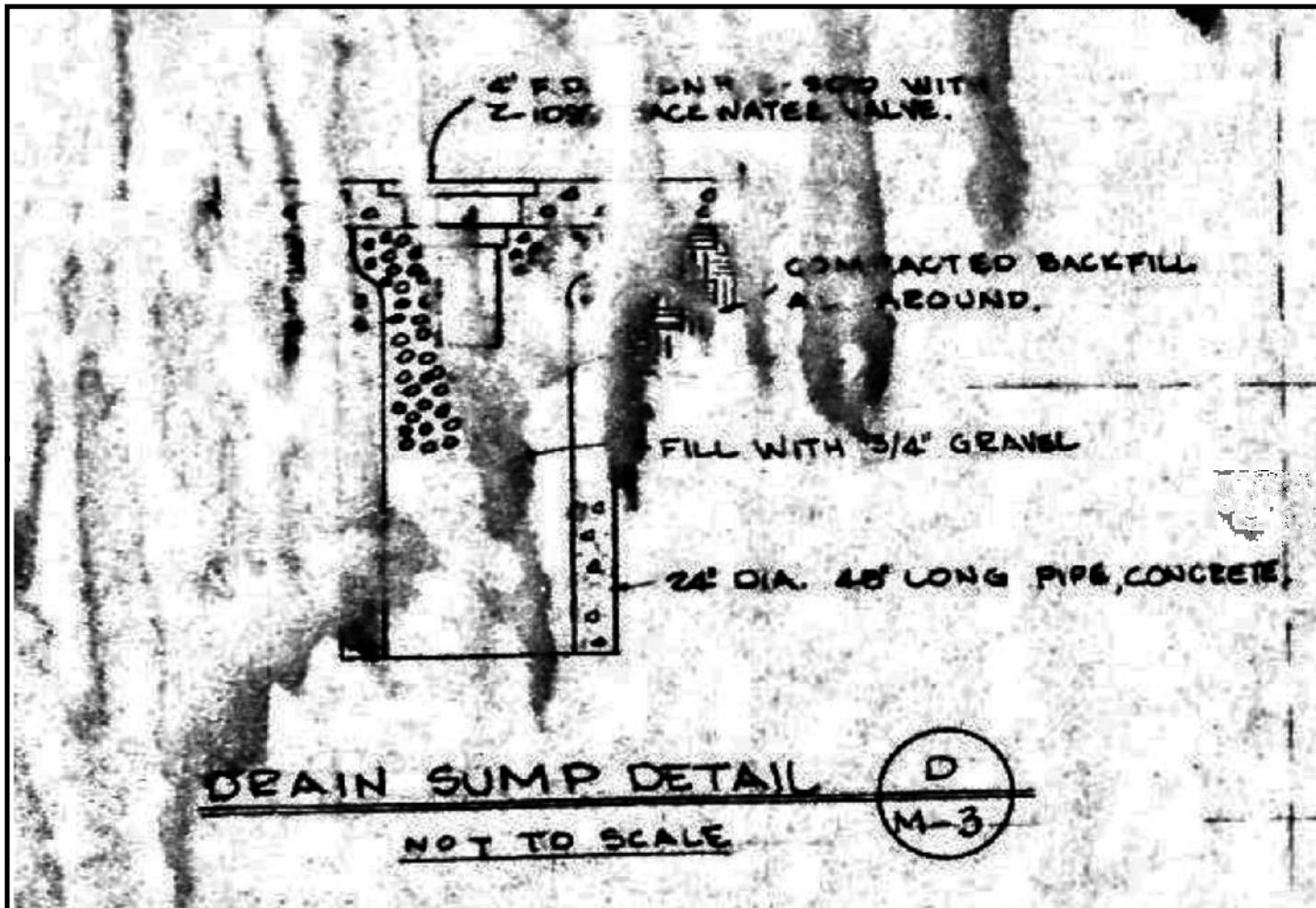


Image clipped from 1974 Cordova Airport ARFF Building Plans. Plans were damaged in storage. No as-built details are available. We assume construction based on plans.

Figure 3

Cordova Airport ARFF Building  
Injection Well Closure Work Plan  
Cordova, Alaska

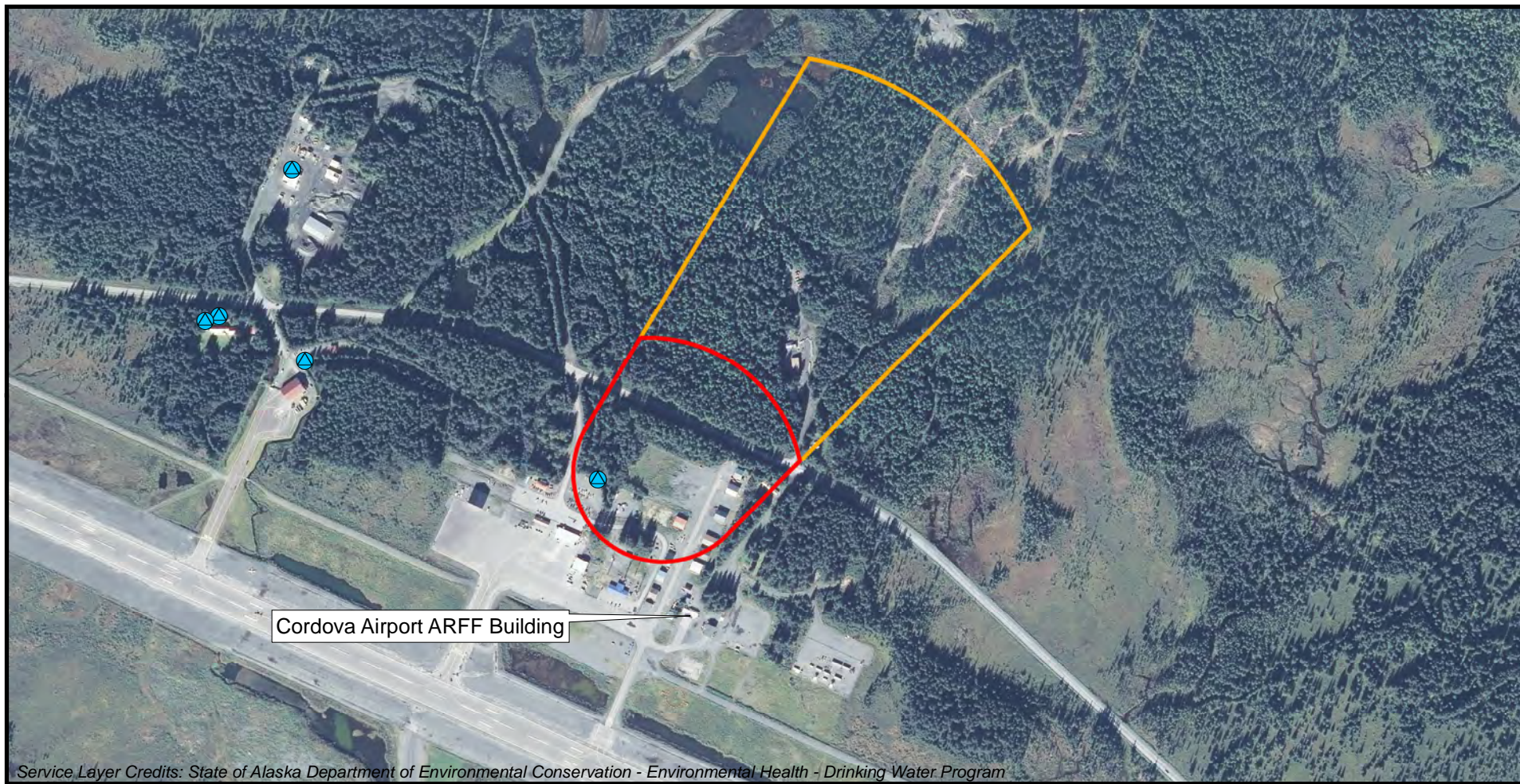
**FLOOR DRAIN  
PLAN DETAIL  
1974**

February 2021

103311-008




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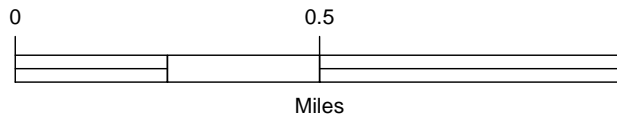
**Figure 3**




Service Layer Credits: State of Alaska Department of Environmental Conservation - Environmental Health - Drinking Water Program

**LEGEND**

-  Confirmed and Suspected Drinking Water Wells
-  Zone A (GW-Several Months Time of Travel or SW 1000 ft buffer)
-  Zone B (GW-2 Yr Time of Travel or SW-1 mile buffer)



Cordova Airport ARFF Building Site Characterization Work Plan Cordova, Alaska
<b>DEC GROUNDWATER          PROTECTION AREA</b>
February 2021 <span style="float: right;">103311-008</span>
 <b>SHANNON &amp; WILSON, INC.</b> <small>GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS</small>

**Figure 4**

**Figure 4**

Appendix A

# Site Safety and Health Plan

APPENDIX A: SITE SAFETY AND HEALTH PLAN

Appendix A

# Site Safety and Health Plan

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## Enclosures

- DOT&PF's COVID-19 Management Plan
- Guidance for Field Work During the COVID-19 Pandemic

- Guidance for Residential Water Sampling During the COVID-19 Pandemic

Shannon & Wilson prepared this Site Safety and Health Plan (SSHP) for the initial site characterization activities at the Merle K. (Mudhole) Smith Airport (CDV). The purpose of this SSHP is to protect the health and safety of field personnel from physical and chemical hazards associated with work at this site. This document complies with DOT&PF's April 8, 2020 COVID-19 Management Plan, enclosed. Our contractors will adopt DOT&PF's Management Plan and follow their own COVID-related safety protocols.

The provisions of this plan apply to Shannon & Wilson personnel who will potentially be exposed to safety and/or health hazards during this investigation. Shannon & Wilson employees are covered under its Corporate Safety and Health Program. General safety and health requirements described in that program will be met. Each Shannon & Wilson employee on the site will sign the personal acknowledgement form documenting they have read and understand this SSHP and agree to abide by its requirements. A copy of this SSHP will be kept on-site throughout the duration of sampling operations.

## A.1 SITE HAZARD ANALYSIS

There are two categories of hazards that may occur during the field work: potential chemical exposure hazards and physical hazards associated with site characterization activities. These hazards are discussed below.

### A.1.1 Chemical Exposure Hazards

Contaminated soil and water may be encountered during site exploration activities. PFAS and petroleum compounds are believed to be the primary contaminants of potential concern and may be encountered in soils and water at unknown concentrations.

Shannon & Wilson personnel will implement skin protection when they are to contact potentially contaminated soil or water. Field personnel will wear work gloves or nitrile gloves as needed, and Level D personal protective equipment (PPE). Field personnel will not require respiratory protection based on the current understanding of site conditions and scope of services.

### A.1.2 Physical Hazards

Primary physical hazards associated with site characterization activities include drilling equipment and other heavy equipment; temperature stress; lifting, slipping, tripping, falling; insects and animals; and noise hazards. The best means of protection against accidents related to physical hazards are careful control of equipment activities in the planned work area and use of experienced and safety- and health-trained field personnel.



Field personnel will not enter confined spaces for site characterization activities, nor will they enter trenches or excavations greater than four feet in depth.

#### A.1.2.1 Drilling Activities and Heavy Equipment

Drill rigs have lots of moving parts and are very loud. Field personnel will wear proper PPE including appropriate hearing protection. A safe distance will be kept from the drill rig and field personnel will be aware of drill rig operations and crew movements. Practice good housekeeping around the work areas. Know where the drill rig's emergency shut-off switch(es) are located in order to shut the rig down in an emergency situation.

Underground utilities are present at the site. Utility locates will be requested by Shannon & Wilson prior to conducting any ground penetrating work. In addition, boring will be advanced inside the ARFF Building. The ceiling has a clearance of 22 feet; however, personnel should be aware of hanging fixtures and other overhead hazards.

DOT&PF personnel or CDV tenants may use heavy equipment near or in Shannon & Wilson work areas. Personnel will exercise caution when working around heavy equipment and maintain a safe distance from moving equipment. Eye contact will be made with the operator prior to entering the work area, and personnel within the work area will remain within sight of the operator at all times.

#### A.1.2.2 Temperature Stress

The field effort discussed in this Work Plan will occur between February and March. Cold, wet, and/or windy conditions are possible. Cold stress or injury due to hypothermia will be guarded against by wearing appropriate clothing, having warm shelter available, scheduling rest periods, adequate hydration, and self-monitoring physical and mental conditions.

#### A.1.2.3 Lifting Hazards

Moving coolers of soil samples or other heavy objects presents a lifting hazard. Personnel will use proper lifting techniques and obtain assistance when lifting objects weighing more than 40 pounds.

#### A.1.2.4 Slips, Trips, and Falls

The most common hazards on a job site are typically slips, trips, and falls. These hazards will be reduced through the following practices:

- Personnel will stay alert.

- All access ways will be kept free of materials, supplies, and obstructions at all times.
- Tools and other materials will be located as not to cause tripping or other hazards.
- Personnel should be aware of potential tripping hazards associated with vegetation, debris, and uneven ground.
- Personnel should be aware of limitations imposed by work clothing and PPE.

The project site may be inherently hazardous due to the potential presence of rain, snow, and ice, which can alter the character of the ground surface. The risk for slips, trips, and falls by site workers is increased due to wet or icy surfaces; therefore, workers will use caution when walking at the site.

#### A.1.2.5 Insects and Animals

During the summer and fall months, mosquitoes and other insects are common in areas predominantly covered with vegetation. Wearing PPE should be sufficient to protect site workers. Animals such as moose, bears, and other wildlife may be a hazard near vegetated areas around the airport. If a large animal approaches the site, workers should keep their distance or seek shelter in their vehicles.

#### A.1.2.6 Congested Areas

The site investigation may at times require field personnel to work adjacent to or in roadways. Field personnel will observe the speed and frequency of traffic proximal to the work site. Appropriate cones, barricades, or signs to secure the work area will be used when required.

#### A.1.2.7 Noise Hazards

Noise is considered a probably physical hazard given the proximity of sample locations to an active airport runway and the enclosed space within the ARFF Building. Hearing protection will be used as necessary by field staff when near heavy equipment, drill rigs, or other loud equipment and within the building during drilling activities. Disposable earplugs will be used to reduce noise levels. Disposable earplugs will have the capacity to reduce noise by at least 30 decibels (dB), and below the OSHA PEL (eight-hour TWA) of 85 dB.

#### A.1.2.8 Ventilation

Soil borings will be advanced within the ARFF Building. Access is provided by two bay doors which will remain open during drilling activities to allow for adequate ventilation. Field staff should be mindful of vapors in the breathing space of the ARFF Building Bay and

take precautions such as the use of an N-95 face mask and frequent breaks to allow fumes to dissipate.

### A.1.3 COVID-19 and Other Hazards

Employees will not report to work if they are experiencing symptoms of COVID-19. *Guidance for Field Work During the COVID-19 Pandemic* enclosed. Field staff will screen themselves for COVID-19 symptoms included in the attachment prior to traveling to Cordova. Single occupancy accommodations will be reserved, if possible. Should staff begin to feel ill after reporting to work, they will immediately report their symptoms and return to their lodging. COVID-19 testing is available by appointment at the Cordova Community Medical Center from 9:00 am to 9:30 on Tuesdays, Wednesdays, and Thursdays in the ambulance bay. Appointments can be scheduled by calling (907) 424 - 8000. Individuals with COVID-19 symptoms will quarantine in single-occupancy accommodations.

Samplers will refer to the enclosed *Guidance for Residential Water Sampling During the COVID-19 Pandemic* when conducting residential sampling. It will not be possible to contact each individual resident or business owner prior to beginning the limited water supply well search. Some residents or business owners may decline access to sample locations due to COVID-19 concerns.

Biological, ionizing radiation, and other hazards are not expected to be present. However, be aware of the surroundings and maintain safe work practices in accordance with Shannon & Wilson's Corporate Health & Safety Plan.

## A.2 PERSONAL RESPONSIBILITIES, TRAININGS, AND MEDICAL SURVEILLANCE

Below is a summary of the assignment of responsibilities, training requirements, and medical surveillance information for Shannon & Wilson personnel.

### A.2.1 Assignment of Responsibilities

Shannon & Wilson is responsible for understanding and complying with the requirements of this SSHP. Following is a list of responsibilities of all Shannon & Wilson personnel working on the site:

Shannon & Wilson is responsible for understanding and complying with the requirements of this SSHP. Following is a list of responsibilities of all Shannon & Wilson personnel working on the site:

- Review and follow this SSHP.
- Attend and participate in safety meetings.
- Take appropriate action as described in this SSHP regarding accidents, fires, or other emergency situations.
- Take all reasonable precautions to prevent injury to themselves and their fellow workers.
- Perform only those tasks they believe they can do safely, and immediately report any accidents or unsafe conditions to Shannon & Wilson's Project Manager or Office Health and Safety Manager.
- Halt work, by themselves or by others, when they observe an unsafe act or potentially unsafe working condition.
- Report accidents, illnesses, and near-misses to the local contact and to Shannon & Wilson's Fairbanks office Health and Safety Manager.

#### A.2.2 Personal Training

Shannon & Wilson personnel performing activities on this site and under this plan have completed the appropriate training requirements specified in 29 CFR 1910.120(e). Each individual has completed an annual eight-hour refresher-training course and/or initial 40-hour training course within the last year.

A personal acknowledgement form will be completed by field personnel prior to commencing field activities. This acknowledgment form will document that they have read and understand this SSHP.

#### A.2.3 Medical Surveillance Program

All field personnel performing activities on this site covered by this SSHP have undergone baseline and annual physical/medical examinations as part of Shannon & Wilson's Corporate Health and Safety Program. All field personnel are active participants in Shannon & Wilson's Medical Monitoring Program or in a similar program, which complies with 29 CFR 1910.120(f).

### A.3 PERSONAL PROTECTIVE EQUIPMENT

PPE will be required during the course of the field work. PPE selection will be based primarily on work-task requirements and potential exposure. Field personnel will use Level D protective equipment during normal work activities. Personnel are trained in the use of PPE that is, or may be, required. All personnel shall wear Level D PPE as a minimum:

- standard work clothes or cotton overalls;
- reflective, high-visibility safety vest;
- safety-toe boots;
- safety glasses
- cloth and/or disposable face mask
- hearing protection (on hand if needed);
- gloves; and,
- hard hat.

Disposable nitrile gloves will be worn during any activity that may require dermal contact with potentially contaminated media.

#### A.4 DECONTAMINATION PROCEDURES

Equipment decontamination procedures are necessary for any reusable equipment that comes into contact with contaminated soil and/or water. Decontamination procedures will consist of a rinse with non-phosphate-based detergent, a second rinse with plain tap water, and a final rinse with distilled water. Sampling equipment and PPE that is expendable will be disposed of at the site or in a landfill off-site.

Shannon & Wilson will conduct all site characterization activities in Level D PPE. Personnel decontamination will consist of the following:

- At the conclusion of site work each day, disposable PPE (likely limited to nitrile gloves) will be placed in trash bags for off-site disposal.
- Employees will wash their hands and face with soap and water before eating, drinking, smoking, or applying cosmetics.

#### A.5 ACCIDENTS AND EMERGENCIES

Shannon & Wilson field personnel are current in first aid and cardiopulmonary resuscitation (CPR) training. At a minimum, the following site safety equipment and first aid supplies shall be available in the field:

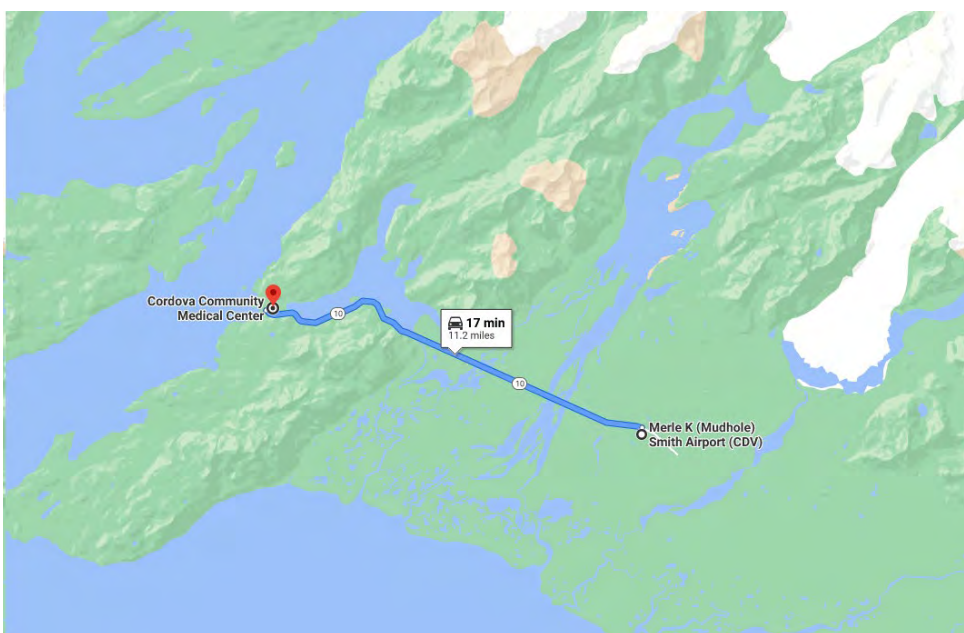
- PPE and clothing specialized for known site hazards;
- first aid kit, including first aid booklet;
- portable eye wash;
- clean water in portable containers; and

- other decontamination supplies.

The primary emphasis of any health and safety plan is accident prevention. If an injury or illness occurs during the course of field work, the severity of the problem will dictate the level of response. Minor injuries or illness will be addressed with basic first aid measures as recommended by a registered nurse through Shannon & Wilson's corporate Medcor service (1-800-775-5866).

More serious injuries will require assistance from the medical staff at the Cordova Community Medical Center, located at 602 Chase Ave, in Cordova Alaska. The Cordova Medical Center is open from 8am to 5 pm daily for primary care and provides 24 hours per day emergency care services. The general call line for the Cordova Community Medical Center is (907) 424-8000. Field phones will be kept easily accessible in the case of an emergency.

Exhibit A-1: Directions from CDV to the Cordova Community Medical Center



Shannon & Wilson's Corporate Health and Safety Program requires accident reporting when there is a site-related accident, near-miss incident, or medical emergency. If an employee is treated by medical personnel, the medical attendant will complete an Incident Medical Treatment Documentation form. Completion of an Alaska Department of Labor Report of Occupational Injury or Illness is also required within 10 days for any work-related injury or illness.

## A.6 GENERAL SITE SAFETY REQUIREMENTS

The following measures are designed to augment the specific health and safety guidelines provided in this plan:

- Field personnel should avoid contact with potentially contaminated surfaces such as: walking through puddles or pools of liquid; kneeling on the ground; or leaning, sitting, or placing equipment on contaminated soil or containers.
- Field personnel will be familiar with procedures for initiating an emergency response.
- Hazard assessment is a continual process; personnel must be aware of their surroundings and any chemical/physical hazards present.
- Personnel in the exclusion area shall be the minimum number necessary to perform work tasks in a safe and efficient manner.
- The use of contact lenses is prohibited; soft lenses may absorb irritants, and all lenses concentrate irritants.
- Equipment contacting potentially contaminated soil or water must be decontaminated or properly discarded before leaving the site.

Field personnel will be familiar with the physical characteristics of the work site including wind direction, site access, and location of communication devices and safety equipment.

## SITE SAFETY AND HEALTH PLAN PERSONAL ACKNOWLEDGEMENT FORM

### CORDOVA AIRPORT COMBINED MAINTENANCE FACILITY WORK PLAN 2021 SITE CHARACTERIZATION

I have reviewed this document and understand its contents and requirements. A copy of the above-referenced document has been made available to me. I agree to abide by the requirements of this Site Safety and Health Plan.

_____	_____	_____
Signature	Name (printed)	Date

_____	_____	_____
Signature	Name (printed)	Date

_____	_____	_____
Signature	Name (printed)	Date

_____	_____	_____
Signature	Name (printed)	Date



# COVID-19 Management Plan

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## **Purpose**

In response to the Global COVID-19 Pandemic, countries, companies, communities and individuals have been called upon worldwide to make every effort to minimize to the greatest extent possible the risks associated with the transmission and perpetuation of the coronavirus. This document provides guidance to help mitigate the transmission of the coronavirus and provide safe and healthy working environments.

## **Scope**

This document is designed to give clear, concise, consistent direction to essential critical infrastructure personnel working throughout the State of Alaska. Due to the fluidity of the events surrounding this pandemic, this document is considered a “living document” and will be updated as conditions change, and as relevant information is disseminated by local, state and federal agencies.

## **Roles and Responsibilities**

The Management Team is committed to ensuring the health, safety and protection of personnel continuing to work through this pandemic, to their families and to the communities in which they live and work. The following leadership measures have been taken and shall continue throughout the duration of this pandemic:

Senior Management – Senior Management Teams shall continue to monitor the COVID-19 Pandemic situation and changing dynamics. Senior Management Teams shall remain in contact with all applicable local, state and federal leaders and shall ensure that any new directives given by governing bodies are immediately communicated to and implemented by project teams.

Project Management – Project Management Teams shall ensure that all applicable COVID-19 directives from Senior Management are immediately implemented and that all activities are conducted in accordance with the ALARA principle – to ensure that coronavirus transmission risks are As Low As Reasonably Achievable. Project Management Teams are responsible for ensuring that site specific emergency response plans are in place for each location, and that site specific COVID-19 training has been conducted for all field personnel prior to mobilization.

Field Supervisors – Field Supervisors are responsible for ensuring that the procedures contained in this document are available to and are followed by all project related personnel in the field, including workers, vendors, suppliers, client personnel and community members affiliated with or affected by the project. Field Supervisors are responsible for leading daily safety meetings, which shall include daily reminders of and training for COVID-19 precautions and safety measures.

Field Supervisors shall conduct daily health assessments of personnel. If personnel become sick at work the field supervisor shall immediately quarantine the individual and notify the project management team.

Field Personnel – Field personnel are responsible for following the procedures contained in this document; for reporting any unsafe or unsanitary conditions; and for immediately self-reporting and self-quarantining if they have any illness symptoms. Field personnel are responsible for helping to maintain safe, clean and healthy work sites.

## **COVID-19 General Information**

### COVID-19

The most recent information regarding the Corona Virus Pandemic provided by the CDC states:

The CDC is responding to a pandemic of respiratory disease spreading from person-to-person caused by a novel (new) coronavirus. The disease has been named “coronavirus disease 2019” (abbreviated “COVID-19”). This situation poses a serious public health risk. The federal government is working closely with state, local, tribal, and territorial partners, as well as public health partners, to respond to this situation. COVID-19 can cause mild to severe illness; most severe illness occurs in older adults.

### Symptoms

COVID-19 Symptoms may appear 2-14 days after exposure and have been described by the CDC as but not limited to:

- Fever
- Shortness of breath
- dry cough

Emergency Medical Conditions – Severe symptoms described by the CDC as requiring immediate medical attention include but not limited to:

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion or inability to arouse
- Bluish lips or face

How The Virus Is Transmitted - The virus is thought to be spread primarily from person-to-person transmission inclusive of the following:

- People who are in close proximity, generally less than 6 feet, with other people who are infected

- Respiratory droplets produced when an infected person coughs or sneezes which can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs
- Touching a surface or object that has COVID-19 on it and then touching one's own mouth, nose, or possibly the eyes

Other Notes – The following should be considered:

- A person may NOT have a fever and yet still be a carrier of the virus
- People are most contagious when they are symptomatic, for example, experiencing fever, cough, and/or shortness of breath
- Asymptomatic and mildly symptomatic individuals can and also spread COVID-19
- A person without an elevated temperature does not mean he/she has a clean bill of health
- There have been numerous reports of inaccurate temperature readings from the forehead scan type thermometer
- Temperature testing does NOT ensure there is no communicable disease in the workplace and does not prevent the spread of disease
- Many cases are referred to as asymptomatic, which means that some individuals report no symptoms at all, but can still be carriers of the virus and can infect others

Screening – Management Teams shall maintain contact with local, state and federal agencies regarding the rapidly changing COVID-19 screening protocols and COVID-19 testing locations. The following are mandates that are currently in place in the State of Alaska:

- Employees who have travelled from outside the state of Alaska shall not be allowed to report to work prior to a 14-day quarantine period in accordance with DHSS guidelines.
- After the 14-day quarantine period, and prior to being deployed to remote job sites, personnel shall be screened per CDC and state guidelines. (See Wellness Screening Form, Appendix A.) Screening of individuals shall consist of:
  - Screening questions focusing on recent travel locations, known contact with persons known or suspected to have COVID-19, and current symptoms (i.e. fever, dry cough, difficulty in breathing, and/or fatigue)
  - Temperature screen for 100. F or greater to be taken on the same day of travel
- Personnel who do not pass the screening criteria shall not be allowed to mobilize to the jobsite and shall remain in quarantine until the employee is clear from any symptoms and/or has been deemed safe to return to work by a medical professional or qualified member of the Management Team
- Site Supervisors shall remain diligence in making sure that personnel are healthy and fit for work and shall remove, quarantine and report any employee who exhibits the above symptoms.

## **Emergency Response**

Management Teams shall ensure that Emergency Response Plans are in place prior to mobilizing crews to new locations or allowing crews to continue working in existing locations. The Emergency response plans shall be site specific for each project location and shall include the following at a minimum:

- Project name and physical location of the work sites
- Emergency contact list of all project personnel, up to the executive management level responsible for the project
- Quarantine plans and locations for taking care of sick personnel
- Emergency and non-emergency transport plans to remove sick personnel from jobsites
- Locations of emergency medical supplies and PPE for the project
- Reporting matrix with contact information to report infected personnel
- Names, phone numbers and physical addresses of Designated Site Supervisors responsible for monitoring conditions and activating emergency response
- Names, addresses and phone numbers of the following entities:
  - Hospitals
  - Medical clinics
  - Emergency response shelters
  - Police
  - Fire
  - Ambulance
  - Airlines for evacuation if remote
  - Local supply companies (if any)

## **Social Distancing**

In accordance with CDC, WHO and other local, state and federal guidelines and recommendations, Management Teams shall implement Social Distancing procedures to help limit or minimize contact between personnel and other people to help stop the transmission of the coronavirus. Social Distancing procedures shall include the following at a minimum and shall be updated as conditions, guidelines and recommendations change:

- Avoid gatherings of any size both internal and external to operations
- Perform meetings online or via conference call whenever possible
- Discontinue contact greetings such as hugs and handshakes
- Avoid physical contact and practice social distancing, including keeping at least 6 feet of separation from others when possible
- Discontinue collection of handwritten or iPad signatures for safety meetings and instead have the on-site supervisor document meetings and attendance
- Do not congregate in lunch or break room areas

- Have staggered break and lunch times when possible to prevent multiple personnel from being in the same location at the same time
- Limit the number of personnel in a single vehicle to avoid physical contact
- Provide single status rooms
- Allow only essential critical infrastructure personnel and stake holders on locations
- Require all non-essential personnel to work from home when feasible
- Limit face-to-face interactions as much as possible
- Limit trips to populated areas to essential travel for necessities only

### **Prior To Mobilization**

Project Management Teams shall assist with minimizing impacts to communities and limiting interactions with others to the extent possible throughout the duration of all projects. Prior to mobilization, project teams shall ensure that every practical effort has been made to provide for the following:

- That personnel are healthy and ready for work
- All necessary housing and transportation have been arranged
- Availability and/or delivery of Food (or food service)
- Project materials and supplies have been obtained or located
- Acquisition of all required PPE, First-Aid response kits and consumables

Crews shall not mobilize to remote locations until all supplies necessary to safely execute the project have been located, and adequate housing and transportation to provide safe working and living conditions have been obtained.

Project Management Teams shall coordinate with local community leaders and governing entities prior to mobilization. Discuss site-specific plans, and any local/community considerations.

### **Mobilization/Transportation**

Understanding that many remote locations require multiple transportation methods, the following precautions shall be taken to help minimize COVID-19 transmission risks during mobilization and transportation:

- Personnel must pass the health screening process prior to mobilization
- Modes of transportation must be approved by the Project Management Team
- All transportation vehicles, including marine vessels and aircraft shall be cleaned and sanitized in accordance with CDC guidelines prior to each transport
- Transportation methods shall allow adequate space between personnel and overcrowding of transportation methods shall be prohibited
- All vehicles, vessels and aircraft shall contain first-aid kits and PPE to assist if an employee becomes ill during transit

## Sanitizing/Housekeeping

The CDC recommends the following cleaning and sanitizing measures in the workplace and at home:

- Cleaning refers to the removal of germs, dirt, and impurities from surfaces. Cleaning does not kill germs, but by removing them, it lowers their numbers and the risk of spreading infection. Clean soiled surfaces before disinfecting.
- Disinfecting refers to using chemicals to kill germs on surfaces. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface *after* cleaning, it can further lower the risk of spreading infection.
  - A simple disinfecting solution of 1/3 cup of bleach to one gallon of water will kill the coronavirus
  - Isopropyl alcohol 70% or greater will kill the coronavirus
  - Other disinfectants registered with the EPA are also effective
- Ensure that all surfaces and common shared surfaces are cleaned and disinfected daily, including cell phones, computers, table-tops, desktops, doorknobs, copy machine buttons, touch screens, phone receivers, key boards, light switches, faucets handles, hand and power tools, construction equipment, vehicles, break rooms, restrooms, living quarters and all other work and residential areas.
- Ensure that clothing and bedding are laundered in the hottest water possible.
- Empty trash daily and have a separate closed trash receptacle for disposal of potentially contaminated waste, such as PPE, tissues, food waste, paper towels, disposable plates, cups and utensils
- Clean and disinfect trash cans
- Clean and disinfect surfaces of service and fleet vehicles prior to use, including steering wheels, gear shifters, instrument panels, door handles, control knobs and switches and use aerosol sanitizers inside of closed cabs

## Personal Hygiene

Personal Hygiene is crucial to stopping the spread of COVID-19. (See Appendix B) In order to help stop the spread of germs at work it is critical that personnel practice the following:

- Frequent hand washing for 20 seconds with soap and water, or utilizing hand sanitizer (See Appendix C)
- Cover nose and mouth when coughing or sneezing with arm or tissue, dispose of tissue after use and wash hands after coughing or sneezing
- If possible, do not share tools. Disinfect tools between use by separate employees
- Do not share personal protection equipment (PPE)
- Sanitize reusable PPE per manufacturer's recommendation prior to each use
- Ensure used PPE is disposed of properly and ensure that proper decontamination methods are used when in contact with known COVID-19 contaminated areas

- Utilize disposable gloves where appropriate and wash hands after removing gloves
- Disinfect reusable supplies and equipment
- Utilize disposable hand towels and no-touch trash receptacles
- Request frequent cleaning and sanitation of portable toilets
- Avoid cleaning techniques – such as using pressurized air or water sprays that may result in the generation of bio-aerosols
- Ensure that cleaning and sanitizing supplies are available to employees so that they may clean their work surfaces in their workspaces daily
- Provide reminders and time to the employees to clean their workspaces
- Avoid touching face, especially eyes, nose and mouth

### **Self-Quarantine If Sick**

It is critical that individuals NOT report to work while they are experiencing illness symptoms such as fever, cough, shortness of breath, sore throat, runny/stuffy nose, body aches, chills, or fatigue – Personnel shall inform their supervisor immediately, self-quarantine, stay isolated from others and should seek medical attention if they develop these symptoms!

If an employee becomes sick at work the Site Supervisor shall:

- Isolate and return infected personnel home as quickly as possible
- Notify the Project Management Team immediately upon discovering symptoms
- Limit interaction to one person for taking care of personnel who are quarantined
- Follow CDC guidelines and seek medical help to care for individuals in quarantine

### **OSHA Guidance**

Current OSHA guidance can be found here: <https://www.osha.gov/SLTC/covid-19/>

See Appendix D for OSHA Alert Poster.

**Don't Be Fools! Follow The Rules!**

# **Appendix A – Wellness Screening Form**

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## Wellness Screening for Remote Work Location Deployment

In addition to the screening measures listed in the form below, the Management Team will closely monitor Center for Disease Control (CDC) guidance on the best practices for prevention and response during this rapidly changing pandemic situation.

Conducting temperature checks on employees prior to deployment to a jobsite is a decision that we does not take lightly. During this pandemic, because of concerns for the health and safety of our workers and the public, it will be our policy to conduct such screenings.

Fairbanks Memorial Hospital  
Coronavirus Hotline  
(907) 458-2888

Employee Name: \_\_\_\_\_

Date/Time of screen: \_\_\_\_\_

1. Have you traveled within the previous 14 days? NO YES

○ If yes, where? \_\_\_\_\_

2. Temperature recorded (°F): \_\_\_\_\_ (if  $\geq 100.4$ , verify temp. with second screen)

3. Do you have or have you recently had any of the following symptoms (circle):

- Fever
- Dry cough
- Difficulty in breathing      \*\* Symptoms may appear 2-14 days after exposure.
- Fatigue

Employees who meet any one of the following criteria will not be mobilized to the jobsite without a medical examination and clearance:

- Traveled to countries labeled by CDC as Level 3 Travel Health Notice
- Known contact with a person known or suspected to have COVID 19
- Screening temperature of 100.4 or higher
- Visible or self-reported symptoms of COVID-19

Although these screenings are being conducted in good faith over concerns for employee and public health related to remote job sites, each employee should know the following:

1. A person may NOT have a fever and yet still be a carrier of the virus.
2. A person without an elevated temperature does not mean he/she has a clean bill of health.
3. Temperature testing does NOT ensure there is no communicable disease in the workplace. It does not prevent the spread of disease. It is simply one precautionary screen that can help inform whether or not an employee should deploy to remote site work.

Temperature Screener Signature: \_\_\_\_\_

## **Appendix B – Personal Hygiene Poster**

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# STOP THE SPREAD OF GERMS AT WORK



## COVER YOUR MOUTH AND NOSE WHEN YOU SNEEZE OR COUGH.

Cough or sneeze into a tissue and then throw it away; use your arm or sleeve to cover if you do not have a tissue.

## CLEAN YOUR HANDS OFTEN.

Wash your hands with soap and water, vigorously rubbing together front and back for 20 seconds. Or use alcohol-based hand sanitizers, rubbing hands until they are dry.



## CLEAN SHARED SURFACES AND EQUIPMENT OFTEN.

Use disinfectants to clean commonly touched items such as doorknobs, faucet handles, copy machines, coffee pot handles, desktops, handrails, microwave buttons, keyboards, and elevator buttons. Germs travel fast with multiple hands touching shared surfaces.

## AVOID TOUCHING YOUR EYES, NOSE OR MOUTH.

Germs need an entry point, and the average adult touches his or her face once every three or four minutes. Keep hand sanitizer at your desk to use after meetings or before grabbing one of those doughnuts from the breakroom.



## STAY HOME WHEN YOU ARE SICK AND CHECK WITH A HEALTH CARE PROVIDER WHEN NEEDED.

When you are sick or have flu symptoms, stay home, get plenty of rest and check with a health care provider as needed.



## **Appendix C – Hand Washing Poster**

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KEEP  
CALM  
AND  
WASH  
YOUR  
HANDS

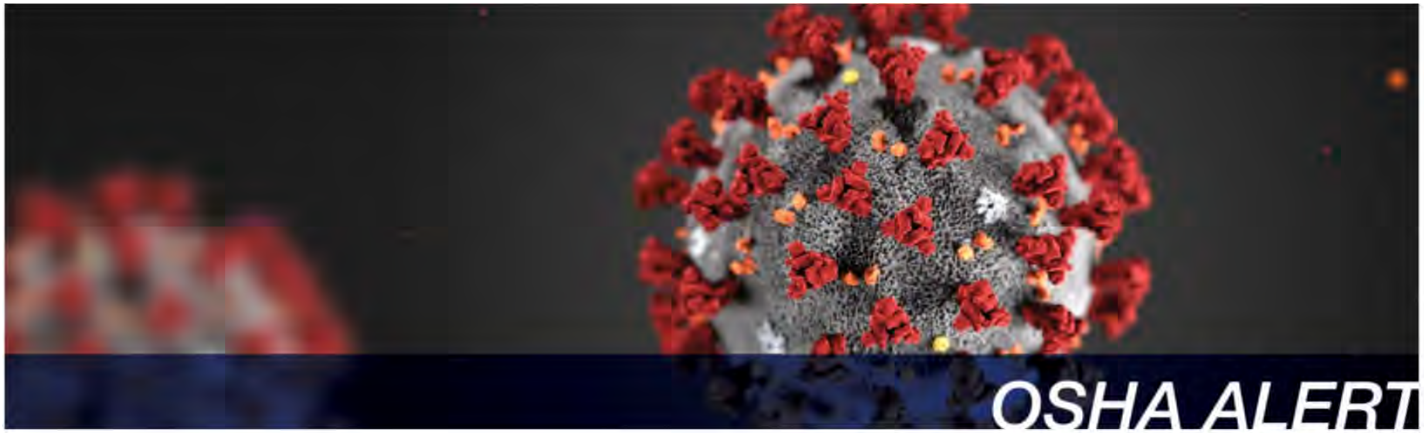


U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention

CS243041B

# **Appendix D – OSHA Alert Poster**

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## Prevent Worker Exposure to Coronavirus (COVID-19)

The novel coronavirus (officially called COVID-19) is believed to spread from person-to-person, primarily through respiratory droplets produced when an infected person coughs or sneezes. The virus is also believed to spread by people touching a surface or object and then touching one's mouth, nose, or possibly the eyes.

Employers and workers should follow these general practices to help prevent exposure to coronavirus:

- Frequently wash your hands with soap and water for at least 20 seconds.
- If soap and running water are not available, use an alcohol-based hand rub that contains at least 60% alcohol.
- Avoid touching your eyes, nose, or mouth with unwashed hands.
- Avoid close contact with people who are sick.

Employers of workers with potential occupational exposures to coronavirus should follow these practices:

- Assess the hazards to which workers may be exposed.
- Evaluate the risk of exposure.
- Select, implement, and ensure workers use controls to prevent exposure, including physical barriers to control the spread of the virus; social distancing; and appropriate personal protective equipment, hygiene, and cleaning supplies.

For the latest information on the symptoms, prevention, and treatment of coronavirus, visit the [Centers for Disease Control and Prevention coronavirus webpage](#).

For interim guidance and other resources on protecting workers from coronavirus, visit OSHA's [COVID-19 webpage](#).

*OSHA issues alerts to draw attention to  
worker safety and health issues and solutions.*

## GUIDANCE FOR FIELD WORK DURING THE COVID-19 PANDEMIC

The purpose of this document is to provide guidance to individuals conducting field work during the outbreak of the coronavirus disease (COVID-19). COVID-19 is a respiratory illness spread by person-to-person contact. In order to slow and prevent the spread of COVID-19, Shannon & Wilson project managers (PM)s and staff shall stay informed with local, state and federal agencies regarding the rapidly changing COVID-19 health mandates, and screening protocols. Field personnel shall adhere to the guidelines provided by the Center for Disease Control (CDC). Shannon & Wilson staff shall also adhere to client safety and COVID-19 requirements.

Symptoms of COVID-19 include:

- Fever,
- Cough,
- Shortness of breath,
- Trouble breathing,
- Persistent pain or pressure in the chest,
- New confusion or inability to arouse, and
- Bluish lips or face.

If field personnel experience any of these symptoms or are feeling sick, they should immediately report their symptoms to the (PM) or their supervisor.

Field personnel should check their internal temperature prior to departing to the work site. If a member of the field personnel's household is sick, field personnel should inform the PM or their supervisor.

**Field personnel should not report to work if they are ill.**

The following practices should be followed as applicable:

- Travel to and from the work site in separate vehicles.
- Wipe down surfaces with sanitizing wipes prior to touching them.
- Maintain a social distance of 6 feet apart, if possible. When not possible, wear a mask. Acceptable masks include manufactured particulate masks, hand-sewn ("homemade") cloth masks, or other styles that cover the wearer's mouth and nose.



- Air purifying respirators with HEPA filter cartridges may be used if the employee has received medical clearance to do so and uses a properly fitted respirator.
- Avoid touching face, especially mouth, nose and eyes.
- Cover sneezes or coughs.
- Assign separate tasks to avoid sharing tools.
- Wash hands with soap and water for at least 20 seconds, when possible.
- Use hand sanitizer with at least 60% alcohol when soap and water are not available.
- Wear disposable gloves, and dispose of them in a trash receptacle after use.
- Stay informed, monitor local conditions, and stay up to date on policy changes enacted by the local, state and federal government.

#### Additional Information

Additional information regarding what to do if you are experiencing symptoms you suspect are related to COVID-19 can be found on the following websites:

<https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/index.html>

Alaska Department of Health and Social Services COVID-19 website:

<http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx>.

Alaska Office of the Governor website: <https://gov.alaska.gov/>.

For current information related to COVID-19 in Alaska you can dial 211 or 1-800-478-2221 from 7am to 8 pm 7 days a week.



# PROPER DISINFECTION OF VEHICLES, SHARED EQUIPMENT, AND COMMON SURFACES

- Create a cleaning/disinfecting plan including:
  - What is being cleaned;
  - When cleaning is to occur;
  - Who is responsible for cleaning what; and
  - How to do it.
- Cleaning (dirt and dust removal by wiping or vacuuming) followed by disinfection must always be performed before and after each day and again if there are known or suspected infectious materials, such as if an employee has a highly contagious infection (e.g. COVID-19). All surfaces must be coated with a disinfectant product, remain wet for at least 5 minutes and allowed to air dry.



Disinfection is to be done using cleaning wipes, spray, or fresh bleach solution. All surfaces must be coated with the product and allowed to air dry. Bleach solution is made by combining ¼ cup bleach with 1 ¼ gallons of water (<https://www.cdc.gov/disasters/bleach.html>). Any solution less than 10% may not be an effective disinfectant.

Bleach solutions must be freshly made immediately prior to decontamination and must be discarded after use. Solutions older than 24 hours may not be effective.

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

- Assign one individual to clean each piece of equipment (or a defined set of pieces) upon arrival each day and on a regular basis during the day, including sinks, copiers, tables, interior and exterior door handles, door-push panels, coffee pots, microwave control panel and door, refrigerator handle, light switches, etc.

- Post signs in common areas reminding everyone to keep them clean.
- Truck users should be responsible for cleaning trucks before and after each day.
- Stock trucks with gloves, wipes, sanitizer, and disinfectant spray.
- Use wipes for localized surficial cleaning while in transit, such as after getting gas or food.
- Consider purchasing redundant pieces of equipment that might limit shared usage (field tools, common-area tools such as staplers, etc.).
- Please reference the *COVID-19 Best Practice Guidelines* for site-specific health & safety plans. The language for both these forms should be added to the JHA section of your SSHSP. Instruct all field staff and/or subcontractors to review at the beginning of each shift.

## COVID-19 compared to other common conditions

SYMPTOM	COVID-19	COMMON COLD	FLU	ALLERGIES
Fever	Common	Rare	Common	Sometimes
Dry cough	Common	Mild	Common	Sometimes
Shortness of breath	Common	No	No	Common
Headaches	Sometimes	Rare	Common	Sometimes
Aches and pains	Sometimes	Common	Common	No
Sore throat	Sometimes	Common	Common	No
Fatigue	Sometimes	Sometimes	Common	Sometimes
Diarrhea	Rare	No	Sometimes*	No
Runny nose	Rare	Common	Sometimes	Common
Sneezing	No	Common	No	Common

\*Sometimes for children

Sources: CDC, WHO, American College of Allergy, Asthma and Immunology

BUSINESS INSIDER

## GUIDANCE FOR RESIDENTIAL WATER SAMPLING DURING THE COVID-19 PANDEMIC

This document provides guidance to Shannon & Wilson, Inc. employees conducting residential water sampling during the outbreak of the coronavirus disease (COVID-19). COVID-19 is a respiratory illness primarily spread by person-to-person contact and airborne particulate matter. Residential sampling requires special considerations due to the nature of the work, where Shannon & Wilson sampling staff enter people's properties and homes in order to collect a water sample. During these sampling events, staff may enter a property owner's or occupant's self-isolation area and may be in close proximity to those persons. In order to slow the spread of COVID-19, Shannon & Wilson has implemented practices to protect both staff and the resident. Shannon & Wilson project managers (PMs) and staff shall stay informed with local, state and federal COVID-19 health mandates as well as client-specified requirements and guidelines. Shannon & Wilson field personnel shall adhere to these guidelines.

Shannon & Wilson project staff will work closely with our clients prior to the planned sampling event to determine if a project should be considered essential work. For field work where travel to communities other than Fairbanks occurs, PMs and project staff will check for local health mandates or recommendations to ensure the community is open to outside essential-business travel before scheduling the sampling event. PMs and staff should also verify the availability of, and additional precautions required by, hotels and other businesses we may rely on during our travels (i.e. restaurants, grocery stores, car rental facilities, hardware stores, etc.).

Prior to scheduling travel, PMs or field staff will contact local government or tribal leadership to assist in determining whether members of the community would be willing to allow staff into their homes to collect samples during this time. Shannon & Wilson staff will not travel to rural communities until we receive permission from the local and/or tribal government. PMs will document the permission and save to the project file.

Where possible, staff will contact individual residents prior to the planned sampling event to determine if they are agreeable to staff entering their premises during the COVID-19 outbreak. Staff are not permitted to collect samples where either the owner or occupant refuses access. During the initial conversation, staff will ask a series of questions to determine if the environment is safe for our staff to enter. Where contact information is not available, staff will publicize the sampling event prior to arrival using available avenues.



Notification tools may include public notices, radio and other news outlets, email list serves, social media posts, and speaking with key community members.

Below is a list of questions staff will ask residents during the initial scheduling of the sampling appointment, and prior to entering the premises.

- Are you feeling sick?
- Has anyone in the household or recent guests experienced symptoms of COVID-19?
- Has anyone in the household or recent guests traveled outside of Alaska within the last 14 days, or are fulfilling a mandated quarantine?
- Have you been in contact with anyone who has been diagnosed with COVID-19 or experiencing symptoms of COVID-19 within the last 14 days?

If the answer is “yes” to any of these questions, sampling at that residence will not occur inside the home. If sampling is to occur on that day, it must be conducted from an outside spigot. If an outside spigot is not available for sampling, a sample will not be collected at that time. Sampling may also occur after a 14-day period has passed and the answer to the questions are no longer “yes”.

While in the community, staff will minimize our exposure and contact, limiting activities to essential business and the outdoors. As a result, we will not hold or join public meetings.

Below are guidelines for traveling to other communities and sampling residential water wells.

- Follow Shannon & Wilson’s *COVID-19 Best Practices and Guidelines and Proper Disinfection of Vehicles, Shared Equipment, and Common Surfaces* plans.
- Follow local, state, federal and client COVID-19 screening guidelines prior to traveling. DO NOT travel if you don’t meet the screening criteria.
- Follow airline-specified requirements for travel.
- While in the field, check body temperature daily before reporting to work. If you have an elevated temperature (greater than 100.4 °F), contact your supervisor or project PM immediately.
- Do not enter occupant property without consent. Let occupant know it is ok to not give permission.



- Wear mask or cloth covering at all times while on occupants' premises and during travel. The sampler will also have a respirator available to wear and use their discretion on when to use it, such as if they are indoors for five minutes or more with someone not wearing a face covering. Prior to wearing the respirator inside the building, the sampler will explain this option to the resident to ease potential fears.
- Cold knocking may be necessary (i.e., initial well searches, no contact information for new occupants, etc.), and require our staff to visit a property without the occupants prior knowledge. Staff will knock on the door, and then back up a minimum of 6 feet from the door. Staff will be wearing a mask and gloves to knock on doors.
- Initial conversations are to be held outside. During this time the sampler will discuss safety for both occupant and sampler. Ask where the nearest sampling point is and explain that for everyone's well-being it is best staff only go a necessary minimal distance into the home.
- The sampler will purge well and sample from an outside spigot, where possible. Inside samples should only be collected where an outside spigot is not available. Field staff will minimize their time spent indoors.
- Request the occupant wear a mask while staff is on the premises. If the occupant refuses, the continuation for sampling at that residence will be at the discretion of the sampling staff. It is likely our staff will not collect a sample in these situations. Staff will arrive at the site with individually pre-packaged masks for residents to wear if they do not already have one.
- Wear nitrile gloves at all times while on the premises. A new pair of gloves should be put on prior to initiating any contact with a residence.
- Ask that occupants stay at least 6 feet away at a minimum. If a resident does not maintain 6 feet distance, our staff have the discretion to leave the premises and not collect a sample at that time.
- Avoid any person to person contact and maintain 6 feet distance from people.
- Ask residents the questions on the questionnaire, don't pass them the paper and ask them fill it out. Staff will not share pens or pass paperwork back and forth during the appointment. However, we will provide copies of paper documents to residents for their reference, where necessary (fact sheets, project contact information, etc.). We will not accept back any paperwork once it has been handled by a resident.



- Wipe down surfaces with a disinfectant prior to and after touching them.
- Only take minimum required sampling equipment into the residence. This will reduce the amount of equipment required to be disinfected and disinfectant supplies.
- Disinfect equipment between residences.
- Don't throw nitrile glove or other refuse in the resident's trash. Keep a closed trash collection point with the sampling equipment and regularly dispose of contents at an approved site such as a dumpster or landfill.

This document is supplemental to our site specific health and safety plan (SSHSP). The guidelines and emergency response plan in the SSHSP should be followed as well as the guidelines outlined in this document.

#### **Additional Information**

Additional information regarding what to do if you are experiencing symptoms you suspect are related to COVID-19 can be found on the following websites:

<https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/index.html>

Alaska Department of Health and Social Services COVID-19 website:

<http://dhss.alaska.gov/dph/Epi/id/Pages/COVID-19/default.aspx>.

Alaska Office of the Governor website: <https://gov.alaska.gov/>.

Current information related to COVID-19 in Alaska is available by phone at 211 or 1-800-478-2221 from 7am to 8 pm 7 days a week.

Appendix B

# Conceptual Site Model

## CONTENTS

- Scoping Form
- Graphic Form

# Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

**Site Name:** Aircraft Rescue and Fire Fighting Building, Cordova Airport, Cordova AK

**File Number:** n/a

**Completed by:** Rachel Willis. Updated 2/2/2021.

### Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

*General Instructions: Follow the italicized instructions in each section below.*

### 1. General Information:

**Sources** *(check potential sources at the site)*

- USTs
- ASTs
- Dispensers/fuel loading racks
- Drums
- Vehicles
- Landfills
- Transformers
- Other:

**Release Mechanisms** *(check potential release mechanisms at the site)*

- Spills
- Leaks
- Direct discharge
- Burning
- Other:

**Impacted Media** *(check potentially-impacted media at the site)*

- Surface soil (0-2 feet bgs\*)
- Subsurface soil (>2 feet bgs)
- Air
- Sediment
- Groundwater
- Surface water
- Biota
- Other:

**Receptors** *(check receptors that could be affected by contamination at the site)*

- Residents (adult or child)
- Commercial or industrial worker
- Construction worker
- Subsistence harvester (i.e. gathers wild foods)
- Subsistence consumer (i.e. eats wild foods)
- Site visitor
- Trespasser
- Recreational user
- Farmer
- Other:

\* bgs - below ground surface



**2. Exposure Pathways:** *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

*If the box is checked, label this pathway complete:*

Complete

Comments:

Contamination of hazardous materials may be present in the surface soil. Contamination may be brought to the surface during construction activities.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

Water for the airport structures is provided by an existing well. Contaminants do not exceed regulatory levels in groundwater, but soil contaminants may migrate to groundwater in the future.

## 2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

## 3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

*If all of the boxes are checked, label this pathway complete:*

Incomplete

Comments:

We suspect that the contamination has not spread beyond the airport property boundary. The airport property is developed and restricted-access.

### c) Inhalation-

#### 1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Complete

Comments:

Volatile contaminants of potential concern include constituents of heating oil. Excavation activities could unearth the contaminated soil, which would affect outdoor air quality. Demolition of the structures could mobilize asbestos dust, which could affect indoor and outdoor air quality.

## 2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)



Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?



*If both boxes are checked, label this pathway complete:*

Complete

Comments:

Contaminants may be present in the soil or groundwater.

**3. Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

**Dermal Exposure to Contaminants in Groundwater and Surface Water**

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**Inhalation of Volatile Compounds in Tap Water**

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM<sub>10</sub>). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

*Check the box if further evaluation of this pathway is needed:*



Comments:

One surface soil sample collected from localized surface soil staining has results above cleanup level for GRO and DRO. These particles may be dispersed in the wind.

## Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

*Check the box if further evaluation of this pathway is needed:*



Comments:

**4. Other Comments** *(Provide other comments as necessary to support the information provided in this form.)*

[Empty rectangular box for providing other comments]

# HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Aircraft Rescue and Fire Fighting Building, Cordova Airport

Completed By: Rachel Willis

Date Completed: Updated 2/2/2021,

**Instructions:** Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Media	(2) Transport Mechanisms
<input checked="" type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to subsurface <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input checked="" type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Ground-water	<input checked="" type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Check all exposure media identified in (2).

Exposure Media

soil

groundwater

air

surface water

sediment

biota

(4) Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.

Exposure Pathway/Route

Incidental Soil Ingestion

Dermal Absorption of Contaminants from Soil

Inhalation of Fugitive Dust

Ingestion of Groundwater

Dermal Absorption of Contaminants in Groundwater

Inhalation of Volatile Compounds in Tap Water

Inhalation of Outdoor Air

Inhalation of Indoor Air

Inhalation of Fugitive Dust

Ingestion of Surface Water

Dermal Absorption of Contaminants in Surface Water

Inhalation of Volatile Compounds in Tap Water

Direct Contact with Sediment

Ingestion of Wild or Farmed Foods

(5) Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.

**Current & Future Receptors**

	Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> Incidental Soil Ingestion	C/F	C/F	F				
<input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil	C/F	C/F	F				
<input checked="" type="checkbox"/> Inhalation of Fugitive Dust	F	F	F				
<input checked="" type="checkbox"/> Ingestion of Groundwater	C/F	C/F	F				
<input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Groundwater	C/F	C/F	F				
<input checked="" type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	F	F	F				
<input checked="" type="checkbox"/> Inhalation of Outdoor Air	C/F	C/F	C/F				
<input checked="" type="checkbox"/> Inhalation of Indoor Air	C/F	C/F	C/F				
<input checked="" type="checkbox"/> Inhalation of Fugitive Dust	C/F	C/F	C/F				
<input checked="" type="checkbox"/> Ingestion of Surface Water	C/F	C/F	C/F				
<input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Surface Water	C/F	C/F	C/F				
<input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

## Appendix C

# Field Forms

### CONTENTS

- Field Activities Log
- Log of Boring
- Soil Sample Collection Log
- Chain of Custody Form





# FIELD LOG OF BORING

DRILL COMPANY/DRILLER: _____ DRILL RIG EQUIPMENT: _____ DRILLING METHOD: _____ HAMMER TYPE: _____ ROD TYPE/DIA.: _____ HAMMER WEIGHT: _____ HAMMER DROP: _____ CASING SIZE/TYPE: _____ HOLE SIZE: _____	JOB NO: _____ BORING NO: _____ JOB NAME: _____ LOGGED BY: _____ LOCATION: _____ ELEV.: _____ START DATE: _____ END DATE: _____ WEATHER DURING DRILLING: _____
--	--

**SAMPLE DATA**

TIME DATE	SAMP. NO. TYPE	FROM DEPTH TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	FIELD CLASSIFICATION
									[density/consistency; color; slightly, minor, MAJOR, then trace constituents; moisture; structure; other; USCS classification (geology)]

<b>SUMMARY FIELD LOG OF BORING</b>			
DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		

COMMENTS (i.e. materials used, visitors, problems, etc.):  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

<b>GROUNDWATER DATA</b>		
WATER DEPTH	TIME	DATE

**SUMMARY OF TIME AND FOOTAGE**

FOOTAGE \_\_\_\_\_ SAMPLES: \_\_\_\_\_ Attempted  
 DRILLED: \_\_\_\_\_ Recovered

DRILL/SAMPLE \_\_\_\_\_ hrs. STANDBY: \_\_\_\_\_ hrs.  
 SETUP/CLEANUP: \_\_\_\_\_ hrs. WELL INSTALL: \_\_\_\_\_ hrs.

OTHER: \_\_\_\_\_

BORING: \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_



# CHAIN-OF-CUSTODY RECORD

Laboratory \_\_\_\_\_

Attn: \_\_\_\_\_

400 N. 34th Street, Suite 100  
Seattle, WA 98103  
(206) 632-8020

2043 Westport Center Drive  
St. Louis, MO 63146-3564  
(314) 699-9660

303 Wellsian Way  
Richland, WA 99352  
(509) 946-6309

2355 Hill Road  
Fairbanks, AK 99709  
(907) 479-0600

5430 Fairbanks Street, Suite 3  
Anchorage, AK 99518  
(907) 561-2120

2255 S.W. Canyon Road  
Portland, OR 97201-2498  
(503) 223-6147

1200 17th Street, Suite 1024  
Denver, Co 80202  
(303) 825-3800

**Analysis Parameters/Sample Container Description**  
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Analysis Parameters/Sample Container Description (include preservative if used)						Remarks/Matrix
				Comp.	Grab					

Project Information		Sample Receipt	
Project Number:		Total Number of Containers	
Project Name:		COC Seals/Intact? Y/N/NA	
Contact:		Received Good Cond./Cold	
Ongoing Project? Yes <input type="checkbox"/> No <input type="checkbox"/>		Delivery Method:	
Sampler:		(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	
Special Instructions:	

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report  
 Yellow - w/shipment - for consignee files  
 Pink - Shannon & Wilson - Job File

Relinquished By: 1.		Relinquished By: 2.		Relinquished By: 3.	
Signature:	Time: _____	Signature:	Time: _____	Signature:	Time: _____
Printed Name:	Date: _____	Printed Name:	Date: _____	Printed Name:	Date: _____
Company:		Company:		Company:	
Received By: 1.		Received By: 2.		Received By: 3.	
Signature:	Time: _____	Signature:	Time: _____	Signature:	Time: _____
Printed Name:	Date: _____	Printed Name:	Date: _____	Printed Name:	Date: _____
Company:		Company:		Company:	

# Important Information

About Your Environmental Report

IMPORTANT INFORMATION

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

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

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

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

#### SUBSURFACE CONDITIONS CAN CHANGE.

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

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

#### MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

#### A REPORT'S CONCLUSIONS ARE PRELIMINARY.

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

#### THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

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

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

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

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

#### READ RESPONSIBILITY CLAUSES CLOSELY.

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

to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

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

IMPORTANT INFORMATION