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REVISION 01

GENERAL WORK PLAN ADDENDUM
DOT&PF Statewide PFAS
Addendum 002-GST-00 Gustavus
Well Monitoring
GUSTAVUS, ALASKA

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Submitted To: Alaska Department of Transportation & Public Facilities
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Attn: Ms. Samantha Cummings

Subject: REVISION 01 GENERAL WORK PLAN ADDENDUM, DOT&PF STATEWIDE
PFAS
ADDENDUM 002-GST-00 GUSTAVUS WELL MONITORING, GUSTAVUS,
ALASKA

Shannon & Wilson prepared this Work Plan Addendum on behalf of the Alaska Department of Transportation & Public Facilities (DOT&PF). This Addendum is a supplement to the *Revision 1 - DOT&PF Statewide PFAS General Work Plan (GWP)*, submitted July 2020. The services proposed in this GWP Addendum, 002-GST-00, describes the DOT&PF planned activities for continued site characterization associated with the per- and polyfluorinated substances (PFAS) contamination originating from the Gustavus Airport (GST).

The scope of services outlined in this Addendum was specified in the proposal dated June 18, 2020 and authorized on July 27, 2020 by DOT&PF under Professional Services Agreement Number 25-19-013 *Per- and Polyfluorinated Substances (PFAS) Related Environmental & Engineering Services*. Funding to implement this Work Plan Addendum was also authorized on July 27, 2020 and will be conducted following the Alaska Department of Environmental Conservation (DEC) approval.

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Important Information

ACRONYMS

AAC	Alaska Administrative Code
AFFF	aqueous film forming foam
BTEX	benzene, toluene, ethylbenzene, and total xylenes
COPC	contaminant of potential concern
CSM	Conceptual Site Model
DEC	Alaska Department of Environmental Conservation
DOA	Alaska Department of Administration
DOT&PF	Alaska Department of Transportation & Public Facilities
DRM	Alaska Department of Risk Management
DRO	diesel range organics
DVPP	Data-Validation Program Plan
EPA	U.S. Environmental Protection Agency
GAC	granular activated carbon
GRO	gasoline range organics
GST	Gustavus Airport Terminal
GWP	General Work Plan
IDW	investigative-derived waste
LHA	lifetime health advisory
LOD	limit of detection
ng/L	nanograms per liter
NPS	National Park Service
PAH	polycyclic aromatic hydrocarbons
PFAS	per- and polyfluoroalkyl substances
PFHpA	perfluoroheptanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PPE	personal protective equipment
POC	point of contact
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RL	reporting limit
RRO	residual range organics
SIM	selective ion monitoring
SSHP	Site Safety and Health Plan
µg/L	micrograms per liter

1 INTRODUCTION

This Addendum, 002-GST-00, is a supplement to the *Revision 1 - DOT&PF Statewide PFAS General Work Plan (GWP)*. This Addendum, in collaboration with the GWP, provides guidance for per- and polyfluoroalkyl substances (PFAS) site characterization activities near the Gustavus Airport (GST) in Gustavus, Alaska (Figure 1). The field activities described in this Addendum include sampling existing water supply wells and groundwater monitoring wells on and off the GST property.

Shannon & Wilson prepared the GWP and this Addendum in 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, with the addition of our Site Safety and Health Plan (SSHP). If additional site characterization activities are required that are not covered in the GWP or deviations are made to the GWP, they will be described in this Addendum.

Exhibit 1-1: Airport Information

Airport Name:	Gustavus Airport
Airport Code:	GST
DEC File No. / Hazard ID:	1507.38.017 / 26904
Airport Address:	1 Airport Way, Gustavus, AK 99826
DOT&PF Region:	Southcoast
DOT&PF Regional POC:	Marcus Zimmerman
DOT&PF PFAS POC:	Sammy Cummings
Airport Type:	Current Part 139 Airport
Airport Coordinates (Lat/Long):	58.4252, -135.7074

POC = point of contact, DEC = Alaska Department of Environmental Conservation, DOT&PF = Alaska Department of Transportation and Public Facilities

1.1 Background

General background information relating to sites covered under the GWP is included in Section 1.1 of the GWP. Background information specific to the GST is detailed below.

The GST terminal is located at 1 Airport Way in Gustavus, Alaska. The property is owned by the Alaska Department of Transportation and Public Facilities (DOT&PF), who also owns multiple adjacent parcels. The geographic coordinates of the GST terminal are latitude 58.4252, longitude -135.7074.

The DOT&PF Crash and Fire Rescue program used aqueous film forming foam (AFFF) for training, systems testing, and emergency response at the GST for many years. Areas of known and potential use are shown as AFFF sites on Figure 1. The precise timeline and locations of AFFF use at the GST are unknown.

1.1.1 Previous Investigations

On May 4, 2018 DEC informed DOT&PF the airport terminal well and National Park Service (NPS) Water System well serving the school were at risk for PFAS contamination. On June 27, 2018, DOT&PF sampled both drinking-water supply wells for the presence of PFAS. The analytical results were received on July 30, 2018. The airport terminal well contained levels of PFAS exceeding the Environmental Protection Agency's (EPA's) Lifetime Health Advisory (LHA) level of 70 nanograms per liter (ng/L) for the sum of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). The NPS well had detections of several PFAS, with concentrations of PFOS and PFOA less than the EPA's LHA level. DOT&PF and the Alaska Department of Administration (DOA) Division of Risk Management (DRM) contacted Shannon & Wilson regarding the Gustavus results. Shannon & Wilson began water supply well search and sampling efforts in August 2018.

Per DEC guidance, the initial response and water supply well sampling in Gustavus referenced the former sum of five PFAS action level of 70 ng/L for sum of PFOS, PFOA, perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), and perfluorononanoic acid (PFNA) for the purposes of assessing drinking-water well contamination. Water supply wells used for drinking and/or cooking with concentrations for the sum of five PFAS exceeding 65 ng/L were provided with an alternative drinking-water source. Sampling events that occurred after April 9, 2019 referenced the EPA LHA. An additional summary of changes to action levels and regulatory requirements is described in section 1.1 of the GWP.

Since August 2018, Shannon & Wilson has collected samples from a total of 113 water supply wells over several visits to Gustavus to analyze for PFAS analytes. Five surface-water samples were also collected during the August 2018 and September 2018 sampling events. In addition, Shannon & Wilson participated in several State of Alaska public-outreach meetings to inform residents about the project.

Water supply well sample concentrations for the sum of PFOS and PFOA have ranged from not detected to 6,110 ng/L for wells associated with the GST PFAS project. Water supply well sampling areas were expanded until PFAS concentrations in wells along the edges of the sampling areas were found to be below the applicable DEC regulatory levels. Water supply well depths are generally between 15 to 25 feet bgs, based on information provided

by the residents and the former local driller. Shannon & Wilson were not able to obtain well-drilling or construction logs to confirm these depths.

Shannon & Wilson performed initial site characterization work at GST in October 2019.

These activities included:

- installation, development and sampling of 15 monitoring wells;
- sampling of eight temporary well points;
- collection of 29 onsite surface soil samples and nine subsurface soil samples from onsite borings;
- collection of 13 sediment samples and 10 surface water samples from onsite and offsite locations; and
- a groundwater elevation survey based on data collected from the monitoring wells and temporary well points.

1.2 Project Objectives and Scope

The first objective of the activities outlined in this Addendum is to continue to monitor the potential for human exposure to PFAS-containing water in water supply wells. This will be achieved through sampling category 1 and category 2 (Section 3.1.2 of GWP) water supply wells that meet the following sampling criteria:

Quarterly

- maximum combined PFOS and PFOA concentration greater than or equal to 35 ng/L but less than the LHA during a previous sampling event; or
- within 500 lateral feet of a water supply well meeting the monitoring criteria.

Annually

- maximum combined PFOS and PFOA concentration greater than or equal to 17.5 ng/L but less than the LHA during a previous sampling event; or
- within 500 lateral feet of a water supply well meeting the monitoring criteria.
- Additionally, the annual sampling event will include sample collection at the following locations: PW-32, PW-47, PW-61, PW-74, PW-207, PW-230, PW-240, PW-241, PW-414 and PW-438, based on recommendations presented in Shannon & Wilson's December 2018 to November 2019 Water Supply Sampling report dated August 2020.

Quarterly sampling events will include quarter 1 (Q1) to occur between January and March, quarter 2 (Q2) to occur between April and June, and quarter 4 (Q4) to occur between

October and December. The annual sampling event will be conducted during quarter 3 (Q3) to occur between July and September.

DOT&PF and Shannon & Wilson will continue to discuss monitoring frequency in Gustavus with DEC. The September 2020 event will be completed as an annual event.

Locations with detections exceeding the applicable action levels are excluded from monitoring events and herein referred to as “affected” locations. Please note that location PW-006 and subsequently PW-003 and PW-074 (within 500 lateral feet of PW-006) are excluded from sampling criteria due to contamination from a secondary source not associated with the GST plume.

The second objective is to evaluate the changes to groundwater concentrations in the area of the GST. This objective will be achieved by collecting groundwater samples from monitoring wells installed in 2019 on a quarterly schedule for a minimum of a year. Following the completion of four quarterly sampling events, Shannon & Wilson will review and validate the analytical results and prepare a final report for DOT&PF and DEC review.

2 SITE AND PROJECT DESCRIPTION

The following sections provide a site and project description.

2.1 Site Location and Boundaries

The GST terminal is located at 1 Airport Way in Gustavus, Alaska. The property is owned by the DOT&PF, who also owns multiple adjacent parcels. Figure 1 shows the property boundaries for land owned by the DOT&PF. The geographic coordinates of the GST terminal are latitude 58.4252, longitude -135.7074.

2.2 Potential Sources of Contamination

General information regarding potential sources of contamination at DOT&PF sites is provided in Section 2.1 of the GWP. Specific potential sources of contamination at the GST to be investigated as a part of this Addendum are listed below.

- Fire training areas where diesel fuel and AFFF were used;
- AFFF-equipment testing areas; and
- AFFF storage areas.

2.3 Contaminants of Potential Concern and Regulatory Levels

General information regarding contaminants of potential concern (COPCs) and regulatory levels is included in Section 2.2 of the GWP. The primary COPCs for the GST site are PFAS. The secondary COPCs for onsite monitoring wells located in former AFFF training areas are benzene, toluene, ethylbenzene, and total xylenes (BTEX), gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), and polycyclic aromatic hydrocarbons (PAHS), as defined in Appendix F of the October 2019 DEC *Field Sampling Guidance*. Diesel fuel was used during training exercises as an ignition/fuel source. The current cleanup levels and analytical reporting limits for these site COPCs are summarized below in Exhibit 2-1.

To evaluate analytical data, groundwater samples will be compared to Alaska's 18 Alaska Administrative Code (AAC) 75.341 *Table C, Groundwater Human Health Cleanup Level* and the EPA LHA (for PFAS). The current cleanup levels and analytical reporting limits for the site COPCs are summarized below in Exhibit 2-1.

Exhibit 2-1: COPCs, Regulatory and Laboratory Reporting Limits

Method	Analyte	Regulatory Water Limit ^a (µg/L)	Laboratory LOD/RL ^b Water (µg/L)
PFAS Analytes			
537.1 ^c	PFOS	0.40	0.00200
	PFOA	0.40	0.00200
537.1 ^d	PFOS/PFOA Total	0.070	0.00200
Petroleum Analytes			
AK101	GRO	2,200	50
AK102	DRO	1,500	300
AK103	RRO	1,100	250
EPA 8021B (BTEX)	Benzene	4.6	0.2
	Toluene	1,100	0.5
	Ethylbenzene	15	0.5
	Xylenes Total	190	1.5
PAH Analytes			
EPA 8270D-SIM (PAH)	1-Methylnaphthalene	11	0.025
	2-Methylnaphthalene	36	0.025
	Acenaphthene	530	0.025
	Acenaphthylene	260	0.025
	Anthracene	43	0.025
	Benzo(a)anthracene	0.30	0.025
	Benzo[a]pyrene	0.25	0.01
	Benzo[b]fluoranthene	2.5	0.025
	Benzo[g,h,i]perylene	0.26	0.025
	Benzo[k]fluoranthene	0.80	0.025
	Chrysene	2.0	0.025
	Dibenzo[a,h]anthracene	0.25	0.01
	Fluoranthene	260	0.025
	Fluorene	290	0.025
	Indeno [1,2,3-c,d] pyrene	0.19	0.025
	Naphthalene	1.7	0.05
	Phenanthrene	170	0.025
Pyrene	120	0.025	

Notes:

- a. 18 AAC 75 Table C. Groundwater Cleanup Levels.
- b. LODs from SGS North America, Inc. for petroleum and PAH analyses, RLs from Eurofins TestAmerica, Inc. for PFAS analyses.
- c. All available PFAS analytes will be requested for analytical reports. However, only PFOS and PFOA have DEC Cleanup Levels. Value will be referenced for monitoring well samples.
- d. All available PFAS analytes will be requested or analytical reports. However, only PFOS and PFOA have DEC Action Levels. Value will be referenced for water supply wells.

BTEX = benzene, toluene, ethylbenzene, and total xylenes; DRO = diesel range organics, EPA = U.S. Environmental Protection Agency, GRO = gasoline range organics, LOD = limit of detection, µg/L = microgram per liter, 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

2.4 Conceptual Site Model

Shannon & Wilson revisited the preliminary conceptual site model (CSM) presented in our first work plan, titled *Work Plan – Revision 1, Gustavus Airport PFAS Site Characterization*. A copy of the most recent version of the CSM is provided as Appendix A and was also provided in Shannon & Wilson’s April 2020 *Revision 1 – Gustavus PFAS 2019 Site Characterization* report.

2.5 Description of Potential Receptors

The CSM considers commercial/industrial workers, site visitors, construction workers, subsistence hunters and consumers, farmers/gardeners, and residents to be current or future potential receptors.

2.5.1 Potential Exposure Pathways

Potential human exposure pathways include inhalation of fugitive dust; direct contact with contaminated sediment; and incidental soil and groundwater ingestion. Additionally, ingestion of wild and farmed foods may be a human exposure pathway as PFOS and PFOA are bioaccumulative (DEC; 2017).

2.5.2 Soil

Incidental ingestion may be a potential direct-contact exposure pathway for soil. Direct contact with the contaminated surface and subsurface soil at the site is unlikely at present. However, future excavation at the site may result in ingestion of soil by commercial workers, site visitors, residents, or construction workers. Contaminated surface soil can become entrained in fugitive dust, which could be a current exposure pathway for site workers, visitors, and nearby residents.

2.5.3 Groundwater

Ingestion of groundwater is an exposure pathway, as several water supply wells near the GST have been found to have PFAS contamination that exceeds state regulatory levels. Water supply wells near the GST are generally shallow, at about 15 – 25 feet bgs. Shannon & Wilson understands setting wells in a deeper, uncontaminated aquifer is not an option in Gustavus. Groundwater may also be used to water edible vegetation (i.e. gardens).

2.5.4 Surface Water and Biota

Surface water, while unlikely to be an exposure pathway because PFAS is not readily absorbed through the skin, is contributing to groundwater contamination by moving

contaminants off-site. Animals are known to use the area where a previous surface-water sample showed contamination (Figure 2). Due to the bioaccumulative risk of PFAS, biota is considered a potential pathway for exposure. Our site assessment activities are not designed to assess the biota exposure pathway. However, we understand the State of Alaska is conducting sampling at various PFAS sites to investigate this pathway.

2.6 Site Safety and Health Plans

Shannon & Wilson’s SSHP will be used by staff to protect the health and safety of field personnel from physical and chemical hazards associated with work at the GST. The SSHP is provided in Appendix B.

2.7 Project Team

Chris Darrah will be Shannon & Wilson’s Principal-in-Charge and Kristen Freiburger will serve as the Project Manager. Shannon & Wilson’s project team also includes other State of Alaska Qualified Environmental Professionals to support the various field and reporting tasks required to achieve the project objectives. The project team and their associated responsibilities are summarized in Exhibit 2-2 below.

Exhibit 2-2: Project Team

Affiliation	Responsibility	Representative	Contact Number
DOT&PF	Client – Regional POC	Marcus Zimmerman	(907) 465-4655
	Client – Statewide PFAS POC	Sammy Cummings	(907) 888-5671
DEC	Regulatory agency POC	Erin Gleason	(907) 269-7556
Shannon & Wilson	Principal-in-charge	Christopher Darrah	(907) 458-3143
	Project Manager	Kristen Freiburger	(907) 458-3146
Eurofins/ TestAmerica, Inc	PFAS analytical laboratory services	David Alltucker	(916) 374-4383
SGS North America, Inc.	Petroleum analytical laboratory services	Jennifer Dawkins	(907) 474-8656

POC = point of contact

2.8 Project Schedule and Submittals

Section 2.5 of the GWP provides general information regarding project schedules (i.e. the general order of occurrence of site characterization activities) and associated submittals.

Upon DEC approval for the proposed scope of services outlined in this Addendum, Shannon & Wilson will coordinate with DOT&PF staff to collect samples of groundwater. Field activities are anticipated to occur during September 2020, following an expedited DEC

review period. Laboratory analysis will be requested on a standard 14-day turn-around time. After four consecutive sampling events have been completed, a Summary Report will be prepared documenting the results of the water supply well and monitoring well sampling events. The report will include summarized field observations, analytical results and discussion, data quality and control summary, field photographs, figures, description of deviations from the approved Addendum, if any, and conclusions and recommendations. The report will also include an updated conceptual site model.

Following each water supply well sampling event, Shannon & Wilson will provide DOT&PF and DEC a data summary within 48 hours (2 business days) and a map and validated table of results within 72 hours (3 business days) of the receipt of water supply well data. In coordination with DOT&PF, Shannon & Wilson will prepare and mail a results letter detailing the analytical results, and other information deemed pertinent to include to water supply well owners/users.

3 SAMPLING AND ANALYSIS PLAN

This section describes the analytical sampling approach for investigating contamination associated with the GST. A general Sampling and Analysis Plan is included as Section 4 of the GWP.

A DEC qualified sampler will collect and handle the samples for projects covered under this Addendum and collect required quality control (QC) samples in accordance with DEC's *Field Sampling Guidance*. Field personnel will document field activities with field notes and photographs, using the applicable field forms (Appendix B of GWP), as detailed in Section 4.2 below.

Analytical laboratories and methods employed as a part of this Addendum are identified in Section 3.4. Sample containers, preservation methods, and holding times are included in Section 3.5. Sample custody, storage, and transport will be followed as described in Section 3.6. Equipment decontamination procedures are outlined in Section 3.7. Investigative derived waste (IDW) management is described in Section 3.8.

3.1 Water Supply Well and Monitoring Well Groundwater Sampling

Monitoring well groundwater sampling is described in Section 4.6 of the GWP. Water supply well groundwater sampling is described in section 4.1 of the GWP.

3.1.1 Monitoring Well Sampling

Monitoring well sampling procedures are described in Section 4.6.3 of the GWP. A Proactive™ submersible water pump (or similar) with new, PFAS-free tubing will be used to collect groundwater samples from each monitoring well. Purge water will be treated and disposed of in accordance with Section 3.8.

3.1.2 Water Supply Well Sampling

Water supply well sampling is described in section 4.1 of the GWP. Purge water will be discharged to an indoor sink leading to a septic system or to the ground surface.

3.2 Analytical Sample Summary

An analytical sample summary is presented in Exhibit 3-1 below.

Exhibit 3-1: Analytical Sample Summary for Water Supply and Monitoring Wells

Number of Samples	Matrix	PFAS (537.1)	GRO (AK101)	DRO (AK102)	RRO (AK103)	BTEX (EPA 8021B)	PAH (EPA 8270D-SIM)
Annual	Groundwater	46 + 11 QC	2 + 2 QC	2 + 2 QC	2 + 2 QC	2 + 2 QC	2 + 2 QC
Quarterly	Groundwater	32 + 9 QC	2 + 2 QC	2 + 2 QC			

Notes:

QC samples include field duplicates and equipment blanks

BTEX = benzene, toluene, ethylbenzene, and total xylenes; 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

3.3 Special Considerations for PFAS Sampling

Special considerations for PFAS sampling are outlined in Section 4.10 of the GWP.

3.4 Analytical Laboratories and Methods

Samples for the analysis of BTEX, GRO, DRO and PAH analytes will be submitted to SGS North America, Inc. of Anchorage, Alaska. Samples for the analysis of PFAS will be submitted to Eurofins TestAmerica, Inc. Laboratory 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 537.1 method. Other analytical samples will be submitted for the analyses listed in Exhibit 3-2.

3.5 Sample Containers, Preservation, and Holding Times

General information regarding sample containers, preservation, and holding times is provided in Exhibit 3-2, below, for the analytical methods employed for this project.

Exhibit 3-2: Sample Containers, Preservation, and Holding Time Requirements

Analyte	Method	Media	Container and Sample Volume	Preservation	Holding Time
PFAS	EPA 537.1	Groundwater	2 x 250-mL HDPE bottles	0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
GRO	AK101	Groundwater	3 x 40-mL VOA vials (no headspace)	HCl to <4 0 °C to 6 °C	14 days to extraction, analyzed within 40 days of extraction
DRO	AK102	Groundwater	2 x 250-mL amber glass	HCl to <4 0 °C to 6 °C	7 days to extraction, analyzed within 40 days of extraction
RRO	AK103	Groundwater	2 x 250-mL amber glass	HCl to <4 0 °C to 6 °C	7 days to extraction, analyzed within 40 days of extraction
BTEX	EPA 8021B	Groundwater	3 x 40-mL VOA vials (no headspace)	HCl to <4 0 °C to 6 °C	14 days
PAHs	EPA 8270D-SIM	Groundwater	2 x 250-mL amber glass	0 °C to 6 °C	7 days to extraction, analyzed within 40 days of extraction

NOTES:

BTEX = benzene, toluene, ethylbenzene, and total xylenes; °C = degrees Celsius, DRO = diesel range organics, EPA = U.S. Environmental Protection Agency, GRO = gasoline range organics, HDPE = high density polyethylene, HCl = hydrochloric acid, mL = milliliter, oz = ounce, PAH = polynuclear aromatic hydrocarbons, PFAS = per- and polyfluoroalkyl substances, RRO = residual range organics, SIM = selective ion monitoring, VOA = volatile organic analysis

3.6 Sample Custody, Storage, and Transport

Sample custody, storage, and transport procedures are described in Section 4.13 of the GWP.

3.7 Equipment Decontamination

Equipment decontamination procedures are described in Section 4.14 of the GWP.

3.8 Investigative-Derived Waste Management

Field activities may generate IDW in the form of purge wastewater and rinsate from equipment decontamination from monitoring well sampling. Purge water from monitoring wells will be treated with granular activated carbon (GAC) and disposed of to the ground surface. An effluent sample will be collected following the completion of the sampling event. Purge water will not be discharged within 100 feet of surface water (18 AAC 72.020(b)).

Purge water from water supply well samples will be purged to the ground surface at the property or septic system. Other IDW will primarily consist of disposable sampling equipment (nitrile gloves, pump tubing, etc.). These items will be disposed of at the Gustavus Landfill.

3.9 Deviations from the General Work Plan

No deviations to the GWP are planned at this time. Any deviations to this plan that occur during the sampling events will be documented in the summary report.

4 QUALITY ASSURANCE PROJECT PLAN

The quality assurance project plan (QAPP) is intended to guide activities during assessment and review of resulting data. Shannon & Wilson will be responsible for conducting data reduction, evaluation, and reporting under this QAPP. A general QAPP is provided as Section 5 of the GWP. Additionally, a Data-Validation Program Plan (DVPP) which describes the procedures for qualifying analytical data in a consistent manner, has been prepared, and is included as Appendix C to the GWP. The following sections describe specific procedures to be followed during sampling at the GST, assuring sampling and documentation are effective, laboratory data are usable, and the information acquired is of high quality and reliable.

4.1 Quality Assurance Objectives

Data quality objectives are detailed in Section 5.1 of the GWP. Numeric quality assurance (QA) objectives for this project are presented in Exhibit 4-1 below.

Exhibit 4-1: Quality Assurance Objectives for Analytical Samples¹

Analyte	Method	Matrix	Precision	Accuracy	Completeness
PFAS	EPA 537.1 ²	Water	±30%	(analyte dependent)	85%
GRO	AK101	Water	±30%	60-120%	85%
DRO	AK102	Water	±30%	60-120%	85%
RRO	AK103	Water	±30%	60-120%	85%
BTEX	8021B	Water	±30%	(analyte dependent)	85%
PAHs	8270D-SIM	Water	±30%	(analyte dependent)	85%

NOTES:

¹ The primary COPCs are PFAS, specifically PFOS and PFOA, for projects conducted under this GWP Addendum. However, Appendix F of DEC's *Field Sampling Guidance* (DEC 2019) identifies the following additional COPCs for sites associated with fire training facilities, fires, and facilities where AFFF was used: GRO, DRO, RRO, BTEX, and PAHs.

BTEX = benzene, toluene, ethylbenzene, and xylenes; 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

4.2 Field Documentation

Field documentation is described in Section 5.2 of the GWP. Field forms to be used for this project are included in Appendix B of GWP.

4.3 Field Instrument Calibration

Field instrument calibration is discussed in Section 5.3 of the GWP.

4.4 Field Quality Control Samples

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

4.4.1 Field Duplicate Sample

Field duplicate sample collection procedures are described in Section 5.4.1 of the GWP. Refer to Exhibit 3-1 for number of field duplicates for each matrix.

4.4.2 Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike and matrix spike duplicate samples will not be collected for this project. However, the laboratories may report these QC samples collected from projects not associated with this Addendum to meet their reporting requirements.

4.4.3 Trip Blank Samples

Trip blank samples are described in Section 5.4.3 of the GWP.

4.4.4 Equipment Blank Samples

Equipment blank sample collection procedures are described in Section 5.4.4 of the GWP.

4.4.5 Field Blank Samples

Field blank sample collection procedures are described in Section 5.4.5 of the GWP.

4.4.6 Temperature Blank Samples

Temperature blanks are described in Section 5.4.6 of the GWP.

4.5 Laboratory Quality Control Samples

Laboratory quality control samples are described in Section 5.5 of the GWP.

4.6 Laboratory Data Deliverables

Laboratory data deliverables are described in Section 5.6 of the GWP.

4.7 Data Reduction, Evaluation, and Reporting

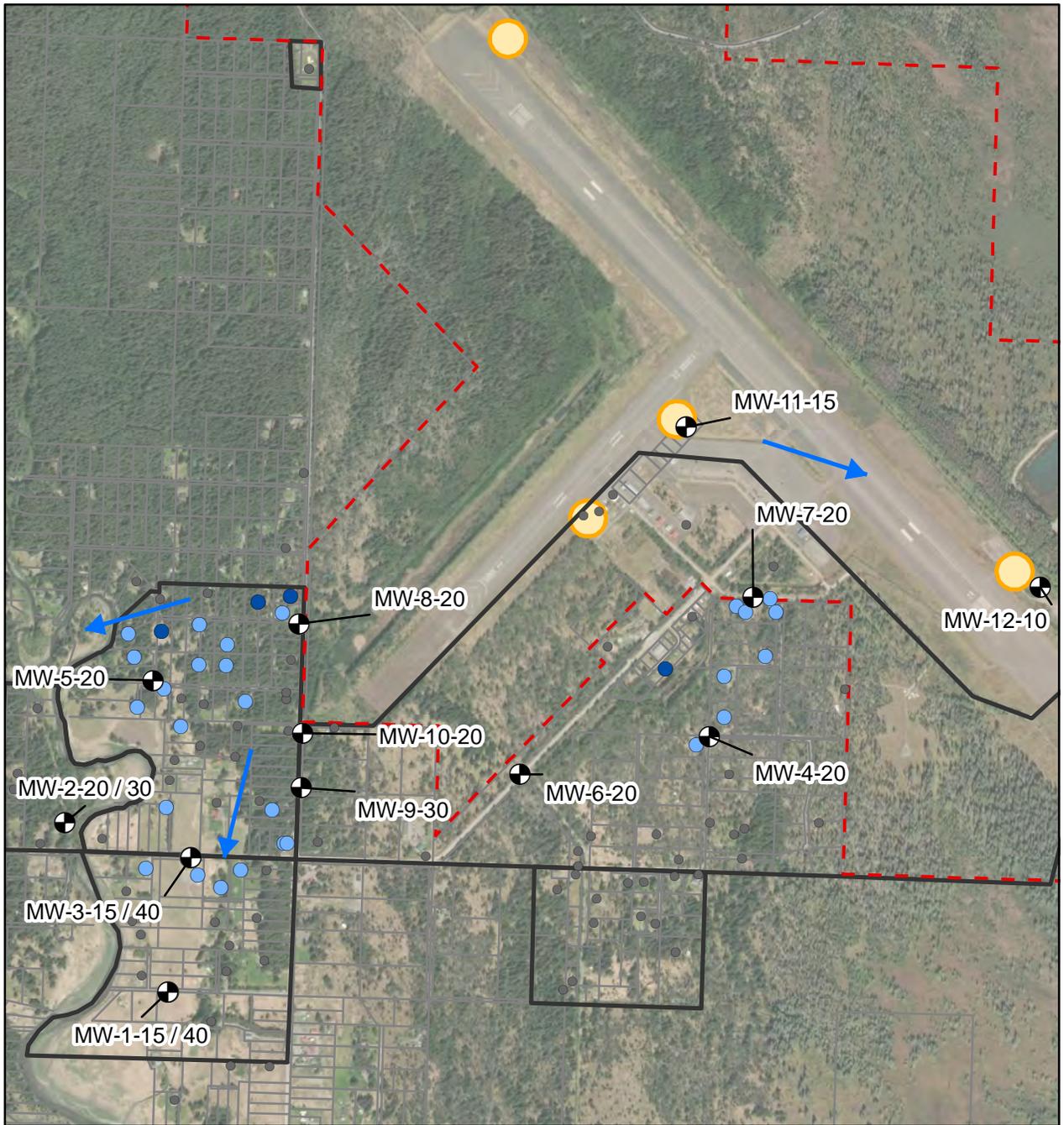
Data reduction, evaluation, and reporting are discussed in Section 5.7 of the GWP.

5 REFERENCES

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- Shannon & Wilson, Inc., 2020, Summary report, December 2018 to November 2019 Water Supply Sampling, Gustavus, Alaska: Report prepared by Shannon & Wilson, Inc., Fairbanks, Alaska, 102599-001, for Alaska Department of Transportation and Public Facilities, Juneau, Alaska, August.



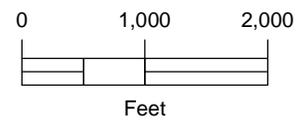
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

Well Monitoring Network

- Annually
- Quarterly
- Not In Network
- ⊕ Monitoring Well

- - - Airport Property Boundary
- ▭ Well Search Areas
- AFFF Sites
- Property Lines
- ← EPA Calculated Hydraulic Gradient



DOT&PF Statewide PFAS
Addendum 002-GST-00
Gustavus, Alaska

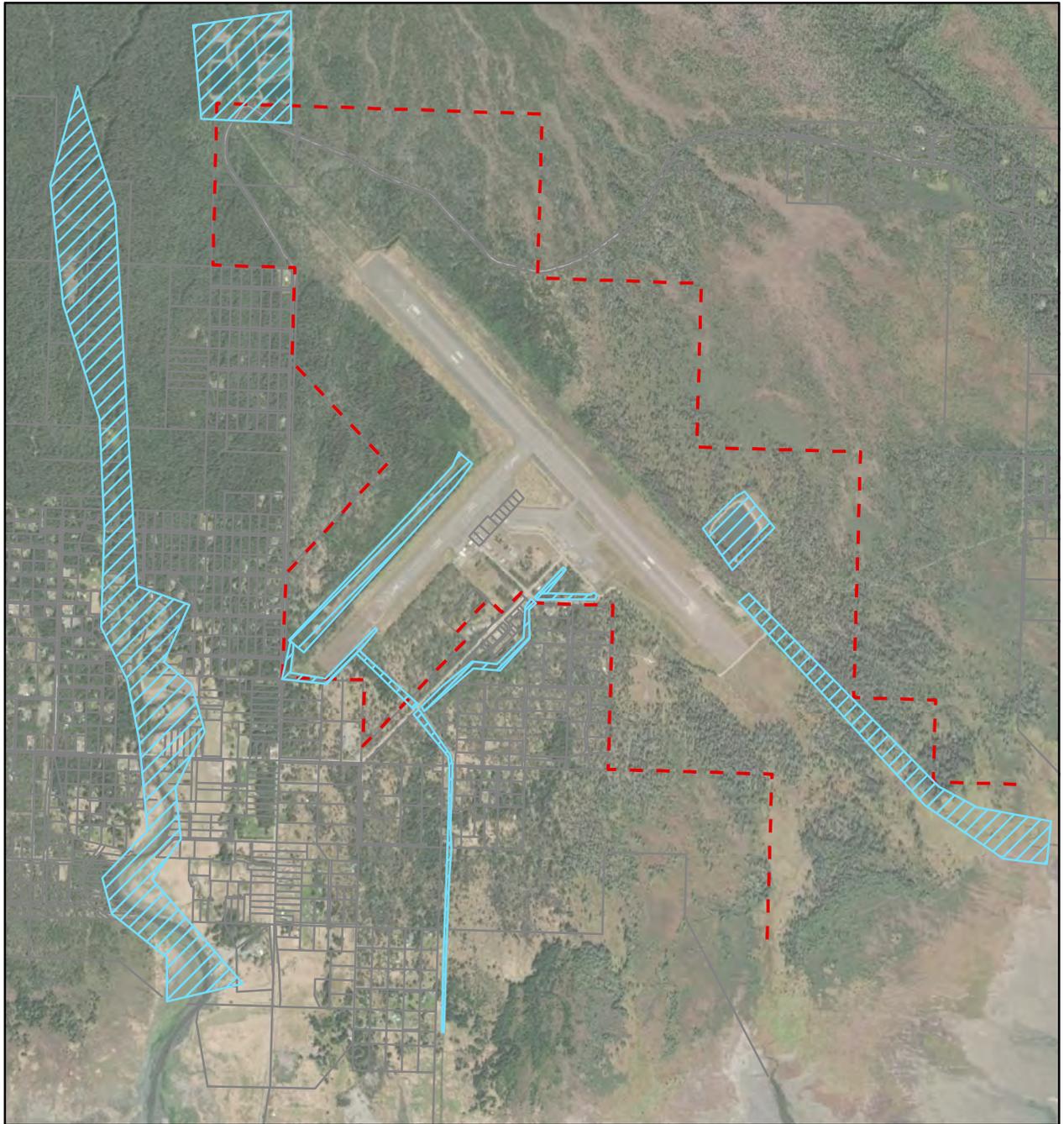
SITE MAP

August 2020

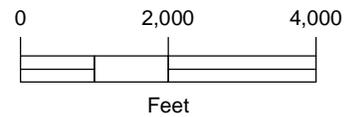
102599-011

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1



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



LEGEND

-  Surface Water Body in Project Area
-  Property Lines
-  Airport Property Boundary



DOT7PF Statewide PFAS
Addendum 002-GST-00
Gustavus, Alaska

**SURFACE WATER BODIES
IN PROJECT AREA
ACCESSIBLE TO WILDLIFE**

August 2020

102599-011

Note: Wildlife is prevalent throughout the site.
Highlighted portions include select known waterbodies/drainages.

Appendix A

Conceptual Site Model

Scoping and Graphics Forms

CONTENTS

- Human Health Conceptual Site Model Scoping Form
- Human Health Conceptual Site Model Graphic Form

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

Site Name:

File Number:

Completed by:

Introduction

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

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

1. General Information:

Sources *(check potential sources at the site)*

- | | |
|--|--|
| <input type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input checked="" type="checkbox"/> Other: <input type="text" value="Fire-training activities"/> |

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

- | | |
|---------------------------------|--|
| <input type="checkbox"/> Spills | <input checked="" type="checkbox"/> Direct discharge |
| <input type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input type="checkbox"/> Other: <input type="text"/> |

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

- | | |
|---|--|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input checked="" type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs) | <input checked="" type="checkbox"/> Surface water |
| <input type="checkbox"/> Air | <input checked="" type="checkbox"/> Biota |
| <input checked="" type="checkbox"/> Sediment | <input type="checkbox"/> Other: <input type="text"/> |

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

- | | |
|---|---|
| <input checked="" type="checkbox"/> Residents (adult or child) | <input checked="" type="checkbox"/> Site visitor |
| <input checked="" type="checkbox"/> Commercial or industrial worker | <input checked="" type="checkbox"/> Trespasser |
| <input checked="" type="checkbox"/> Construction worker | <input checked="" type="checkbox"/> Recreational user |
| <input checked="" type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input checked="" type="checkbox"/> Farmer |
| <input checked="" type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input type="checkbox"/> Other: <input type="text"/> |

* bgs - below ground surface

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

a) Direct Contact -

1. Incidental Soil Ingestion

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

If the box is checked, label this pathway complete:

Complete

Comments:

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:

Incomplete

Comments:

We note PFOS and PFOA are present on the Appendix B guidance document; however, according to the Alaska Department of Health and Social Services, PFOS and PFOA are not appreciably absorbed through the skin. We therefore consider dermal exposure to these compounds to be insignificant.

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:

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:

This pathway is considered complete due to surface-water influence on drinking-water wells in the affected area.

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:

Complete

Comments:

c) Inhalation-

1. Inhalation of Outdoor Air

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

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

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

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:

Incomplete

Comments:

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 - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

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

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



Comments:

Several surface soil samples were above current cleanup levels.

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:

Several surface, subsurface and sediment analytical samples were above current cleanup levels.

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: Gustavus Airport Terminal

Completed By: Craig Beebe; Shannon & Wilson, Inc.

Date Completed: 4/11/19; updated January 10, 2020

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 type="checkbox"/> Volatilization <i>check air</i> <input checked="" type="checkbox"/> Runoff or erosion <i>check surface water</i> <input checked="" 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 type="checkbox"/> Volatilization <i>check air</i> <input checked="" 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 checked="" type="checkbox"/> Flow to surface water body <i>check surface water</i> <input checked="" type="checkbox"/> Flow to sediment <i>check sediment</i> <input checked="" type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Surface Water	<input checked="" type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input checked="" type="checkbox"/> Sedimentation <i>check sediment</i> <input checked="" type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Sediment	<input checked="" type="checkbox"/> Direct release to sediment <i>check sediment</i> <input checked="" type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input checked="" type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Exposure Media	(4) Exposure Pathway/Route	(5) Current & Future Receptors							
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input type="checkbox"/> Dermal Absorption of Contaminants from Soil <input checked="" type="checkbox"/> Inhalation of Fugitive Dust	C/F	C/F	C/F	C/F		F		
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	C/F	C/F	C/F	C/F	C/F			
<input type="checkbox"/> air	<input type="checkbox"/> Inhalation of Outdoor Air <input type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust								
<input checked="" type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water								
<input checked="" type="checkbox"/> sediment	<input checked="" type="checkbox"/> Direct Contact with Sediment	C/F	C/F	C/F	C/F	C/F	C/F		
<input checked="" type="checkbox"/> biota	<input checked="" type="checkbox"/> Ingestion of Wild or Farmed Foods	C/F	C/F	C/F	C/F		F		

Revised, 10/01/2010

Appendix B

Site Safety and Health Plan

CONTENTS

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 - B.1.1 Chemical-Exposure Hazards 1
 - B.1.2 Physical Hazards 1
 - B.1.2.1 Temperature Stress 2
 - B.1.2.1 Lifting Hazards 2
 - B.1.2.2 Slips, Trips, and Falls 2
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 - B.2.1 Assignment of Responsibilities 3
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- B.5. Accidents and Emergencies 5
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ATTACHMENTS:

COVID-19 Safety Plan Attachment and Cleaning JHA

COVID-19 Residential Sampling Safety Plan

SITE SAFETY AND HEALTH PLAN

Shannon & Wilson prepared this SSHP for the well monitoring site characterization and water supply well sampling activities at and near the GST. 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.

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 also 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 complete 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.

B.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.

B.1.1 Chemical-Exposure Hazards

Contaminated soil and water may be encountered during site exploration activities. PFAS 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. Field personnel will not require respiratory protection based on the current understanding of site conditions and scope of services.

B.1.2 Physical Hazards

Primary physical hazards associated with site characterization activities include drilling equipment; temperature stress; lifting, slipping, tripping, falling; and risk of eye injuries. In addition, wildlife may be a hazard in forested areas around the airport. 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.

B.1.2.1 Temperature Stress

Wearing PPE may put a worker at risk of developing heat stress; however, since the field screening activities will be conducted in Level D PPE the risk of heat stress is considered low. 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.

B.1.2.1 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.

B.1.2.2 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 so 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 personal protective equipment (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.

B.1.2.3 Insects and Animals

During the summer months in Alaska, 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 and bears are also commonly seen in Alaska. If a large animal approaches the site, workers should keep their distance or seek shelter in their vehicles.

B.1.2.4 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.

B.1.3 Other Hazards

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.

B.2. PERSONAL RESPONSIBILITIES, TRAINING, AND MEDICAL SURVEILLANCE

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

B.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:

- 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.

B.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.

B.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).

B.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;
- hearing protection;
- gloves; and,
- hard hat.

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

B.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.

B.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 Gustavus Clinic, located at 42 Dolly Varden Road in Gustavus, Alaska. The telephone number for the Gustavus Clinic is (907) 697-3008. Field phones will be kept easily accessible in the case of an emergency.

Exhibit B-1: Map Showing Gustavus Clinic.



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.

B.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.

B.7. COVID SPECIFIC REQUIREMENTS

Shannon & Wilson has produced guidance documents for conducting field work during the outbreak of the coronavirus disease (COVID-19). These guidance documents are included as an attachment to this appendix. Additionally, DOT&PF has provided guidance to their contractors for work conducted for the State of Alaska during the COVID-19 outbreak. This information is located at the following link: <http://dot.alaska.gov/2020>.

SITE SAFETY AND HEALTH PLAN PERSONAL ACKNOWLEDGEMENT FORM

DOT&PF STATEWIDE GENERAL WORK PLAN
ADDENDUM 002-GST-00: GUSTAVUS WELL MONITORING

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

Representing

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.

Important Information

About Your Geotechnical/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