

SUBMITTED TO:  
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International Airport  
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GENERAL WORK PLAN ADDENDUM  
DOT&PF Statewide PFAS  
Addendum 033-ANC-01  
Water Supply Well Search Work Plan  
ANCHORAGE, ALASKA

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Submitted To: Ted Stevens Anchorage International Airport  
P.O. Box 196960  
Anchorage, Alaska 99519  
Attn: Scott Lytle

Subject: GENERAL WORK PLAN ADDENDUM, DOT&PF STATEWIDE PFAS  
ADDENDUM 033-ANC-01  
WATER SUPPLY WELL SEARCH WORK PLAN, ANCHORAGE, ALASKA

Shannon & Wilson prepared this Work Plan Addendum on behalf of the Alaska Department of Transportation & Public Facilities (DOT&PF), Ted Stevens Anchorage International Airport (ANC). This Addendum is a supplement to the *DOT&PF Statewide PFAS General Work Plan Revision 1 (GWP)*, submitted July 2020. The services proposed in this GWP Addendum, 033-ANC-01, describe the plan for initial water supply well search activities associated with per- and polyfluorinated substances (PFAS) at ANC.

The scope of services was specified in our proposal dated October 22, 2020, authorized on October 27, 2020 by NTP P12-1 under Professional Services Agreement Number 25-19-1-013 *Per- and Polyfluorinated Substances (PFAS) Related Environmental & Engineering Services*. Funding to implement this GWP Addendum will be requested following Alaska Department of Environmental Conservation (DEC) review and approval.

This GWP Addendum was prepared and reviewed by:



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Environmental Scientist



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Senior Associate

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## ACRONYMS

AAC	Alaska Administrative Code
ADNR	Alaska Department of Natural Resources
ANC	Ted Stevens Anchorage International Airport
ANGB	Air National Guard Base
AFFF	aqueous film forming foam
ARFF	Aircraft Rescue and Firefighting
ANGB	Air National Guard Base
AWWU	Anchorage Water and Wastewater Utility
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
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
FAA	Federal Aviation Administration
GRO	gasoline range organics
GWP	General Work Plan
LHA	Lifetime Health Advisory
MOA	Municipality of Anchorage
mg/kg	milligram per kilogram
ng/L	nanograms per liter
PAH	polycyclic aromatic hydrocarbons
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
POC	point of contact
RRO	residual range organics
µg/L	microgram per liter
USGS	U.S. Geological Survey
VOCs	Volatile Organic Compounds
WELTS	Well Log Tracking System

# 1 INTRODUCTION

This Addendum, 033-ANC-01, is a supplement to the *DOT&PF Statewide PFAS General Work Plan Revision 1 (GWP)*. In collaboration with the GWP, this Addendum provides guidance for per- and polyfluoroalkyl substances (PFAS) water supply well search activities at and near the Ted Stevens Anchorage International Airport (ANC) in Anchorage, Alaska (Figure 1, Exhibit 1-1).

Shannon & Wilson prepared the GWP and this Addendum 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. If additional activities are required that are not covered in the GWP or are deviations from the GWP, they will be described in this Addendum. Exhibit 1-1 below provides site specific information associated with the ANC.

## Exhibit 1-1: Airport Information

Airport Name:	Anchorage Airport
Airport Code:	ANC
DEC File No. / Hazard ID:	2100.38.028.038 <sup>1</sup> ; 2100.38.028.39 <sup>1,2</sup> ; 2100.38.028.05 <sup>1,2</sup> / 27120; 27137; 3155
Airport Address:	5000 West International Airport Road, Anchorage, Alaska 99502
DOT&PF Regional POC:	Scott Lytle and Kenton Curtis
DOT&PF PFAS POC:	Sammy Cummings
Airport Type:	Current Part 139 Airport
Airport Coordinates (Lat/Long):	61.1769, -149.9891

NOTES:

1 Sitewide PFAS CSP Site

2 Information status only CSP Site

CSP = Contaminated Sites Program, DEC = Alaska Department of Environmental Conservation, DOT&PF = Alaska Department of Transportation & Public Facilities, PFAS = per- and polyfluoroalkyl substances, POC = point of contact

## 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 ANC is detailed below.

### 1.1.1 Previous Investigations

The use of aqueous film forming foam (AFFF) as a fire retardant at ANC resulted in preliminary investigative sampling of PFAS in 2016. According to the DEC contaminated

sites database, PFAS contamination is present at the Aircraft Rescue and Fire Fighting (ARFF) Building (also known as the Police and Fire Building or Safety Building). Perfluorooctanesulfonic acid (PFOS) was reported at 23,000 nanograms per liter (ng/L) in shallow groundwater, 6,600 ng/L in surface water, and 0.18 milligram per kilogram (mg/kg) in soil.

Part 139 Airports are required to conduct annual AFFF systems testing to maintain their certification through the Federal Aviation Administration (FAA). Prior to 2019, FAA inspections required the release of AFFF to the ground surface. AFFF has been used at the ANC for decades and is used by most of the aircraft hangars on airport property. The Anchorage International Airport Police and Fire Department have occasionally used AFFF during fire training and prevention activities conducted once or twice a year at a location south of east-west runway 07R/25L. AFFF has also been used for certification purposes by spraying into the snow dump area to the north of the ARFF facility, at the end of DeHavilland Road. AFFF has been released in various locations on a few occasions for emergency response incidents at the ANC. Areas of known and potential use are shown on Figure 1. The precise timeline and locations of all potential AFFF releases are unknown.

### 1.1.2 Geology

The ANC is located in southcentral Alaska, along the eastern shore of Upper Cook Inlet. This area consists primarily of broad outwash plains, flood plains, stream terraces, and tidal plains. Most landforms in the area have been influenced by glaciations and many are mantled by loess deposits. Soil parent materials include sandy and gravelly glacial outwash, and loamy and gravelly glacial drift. The tidal plains along Cook Inlet consist of silty and clayey sediments. Poorly drained bogs and fens occupy broad depressions and occur throughout the ANC.

Sediments known as the Bootlegger Cove formation underlie most of the area at depths between 0 and 200 feet below ground surface (bgs). These sediments are mostly silt with up to 5 percent clay minerals. During development of the ANC area beginning in the 1950s, low-lying lands were drained and filled for commercial and residential use. The ANC is located in a natural lowland area with elevations generally less than 200 feet above mean sea level and containing numerous lakes and muskegs. (DOT&PF, 2020)

### 1.1.3 Groundwater and Drinking Water

According to the August 2004 *Final Airport-Wide Risk Management Plan* prepared by Shaw Environmental, Inc., three distinct water bearing zone area present within the ANC. A deep aquifer, greater than 150 feet bgs, an upper aquifer from 50 feet to 70 feet bgs, and a series of

shallow discontinuous aquifers that in some locations reach the ground surface. Groundwater flow direction varies throughout the ANC relative to topography and proximity to lakes, but it generally flows to the northwest toward Cook Inlet (USGS, 1995; DOT&PF, 2020). In 2001, the DEC approved a Section 350 determination for the upper unconfined aquifer at ANC in the airside and commercial zones, which includes the majority of the ANC property.

The Anchorage Water and Wastewater Utility (AWWU) supplies the majority of Anchorage and ANC vicinity (DEC Public Water System ID No. 2210906). AWWU sources their water primarily from Eklutna Lake, located in the Chugach Mountain Range Valley, about 25 miles northeast of Anchorage. The Ship Creek headwaters at Ship Lake and several groundwater wells are used as a secondary water source for Anchorage (AWWU, 2020).

## 1.2 Project Objectives and Scope

The project objective is to begin planning water supply well sampling to determine the extent of PFAS contamination in drinking water wells near the ANC.

The scope for this initial water supply well search effort includes:

- conducting a limited water supply well search to confirm municipal water is the source of drinking water near the ANC; and
- Reporting the results of our findings in a summary report to be submitted to DOT&PF and DEC.

The proposed search area for the limited water supply well search is presented in Figure 1.

## 2 SITE AND PROJECT DESCRIPTION

The following sections provide site and project descriptions.

### 2.1 Site Location and Boundaries

The ANC is located at 5000 West International Airport Road in Anchorage, Alaska. The airport is southwest of downtown Anchorage and east of Cook Inlet. Runways 25L-7R and 25R-7L run east-west on the southern portion of ANC. Runway 15-33 runs northwest-southeast in the central portion of the ANC. Figure 1 shows the property boundaries for land owned by the DOT&PF. The geographic coordinates of the ANC terminal are latitude 61.1759, longitude -149.9901.



The Former Kulis Air National Guard Base (ANGB) Alaska is located along the southern boundary of the ANC (see Figure 1). During previous investigation activities of AFFF releases at the Kulis ANGB conducted by the U.S. Air Force in 2016 and 2017, PFOS and perfluorooctanoic acid (PFOA) were detected in groundwater at concentrations above the DEC Human Health Groundwater Cleanup Levels (CULs) (DEC, 2016). As a result, the U.S. Air Force scheduled water well survey and sampling activities of a residential area, east of the former Kulis ANGB in 2020 (AFCEC/CIBW, 2020). The well survey area is shown on Figure 1. The survey was scheduled for 2020, but postponed due to COVID-19. The survey has been tentatively rescheduled for 2021. The Kulis ANGB well survey area will not be included as part of the water well search activities outlined in this plan.

## 2.2 Potential Sources of PFAS Contamination

General information regarding potential sources of contamination at DOT&PF sites to be covered under the GWP is included in Section 2.1 of the GWP. This well survey project does not include researching potential sources of PFAS contamination, associated with ANC or off-site parcels. Specific potential sources of PFAS contamination at the ANC are listed below.

- fire training areas where AFFF was believed to have been used;
- identified areas of historic AFFF releases shown on Figure 1;
- FAA required AFFF systems testing areas at various, unknown locations along the ANC runways; and
- AFFF storage areas including DOT&PF's ARFF building.

## 2.3 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 Conceptual Site Model Graphic Form and Human Health Conceptual Site Model Scoping Form was completed as part of the August 2004 Management Plan.

Limited analytical data is available regarding the potential PFAS-affected media at and near the ANC. The CSM will be revised over the course of the project. According to the 2004 CSM, the potentially affected media include surface and subsurface soil, air, groundwater, surface water sediment, and biota.

## 2.4 Project Team

Chris Darrah is Shannon & Wilson’s Principal-in-Charge and Kristen Freiburger is Project Manager for the DOT&PF Statewide PFAS contract. Dan McMahon will serve as the Environmental Lead for the ANC site and be Shannon & Wilson’s primary point of contact (POC). 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 2-1: Project Team**

Affiliation	Responsibility	Representative	Contact Number
DOT&PF	Client – Regional POC, Engineering	Scott Lytle	(907) 266-2129
	Client – Regional POC, Environmental	Kenton Curtis	(907) 266-2832
	Client – Statewide PFAS POC	Sammy Cummings	(907) 888-5671
DEC	Regulatory agency POC	Robert Burgess	(907) 451-2153
Shannon & Wilson	Principal-in-charge	Chris Darrah	(907) 458-3143
	Statewide Project Manager	Kristen Freiburger	(907) 458-3146
	Environmental Lead POC	Dan McMahon	(907) 433-3223

POC = point of contact

## 2.5 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.

Once DEC approval is received for the proposed scope of services outlined in this Addendum, Shannon & Wilson will begin the water supply well search activities, which are tentatively scheduled for April 2021. 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, and the Municipality of Anchorage (MOA) regarding the COVID-19 pandemic.

The report will include summarized field observations, figures showing water supply wells, description of deviations from the approved Addendum, if any, and conclusions and recommendations. The report will also include an updated CSM, and a discussion of the documented wells, including the well depths and whether the well is completed within the deep, upper, or shallow aquifer.

The anticipated schedule is outlined below:

- DEC comments addressed; approval received – April 2021
- Addendum implementation (well search activities) – May 2021
- Draft Report Submittal – June 2021
- Final Report Submittal – within 30 days of receiving DEC comments on the Draft Report

### 3 WATER SUPPLY WELL SEARCH

General information regarding water supply well search activities are described in Section 3.1 of the GWP. Shannon & Wilson will conduct a water supply well search for the area presented in Figure 1. AWWU water utility maps will be reviewed, along with the MOA Assessor's office real estate and personal property tax records for the Municipality of Anchorage to determine which parcels are connected to municipal water services. Shannon & Wilson will request additional records from the MOA and AWWU to confirm municipal water is the source of drinking water at properties within 0.25 mile of the ANC property boundary (Figure 1). These properties will be compared to well data obtained from the United States Geologic Survey (USGS), the Alaska Department of Natural Resources (ADNR) Well Log Tracking System (WELTS) database, and ANC to determine potential well locations.

After reviewing available utility-connection and property-ownership records, Shannon & Wilson will prepare detailed maps for the well search field effort. Field staff will visit parcels in the well search area to match utility-connection records with developed structures. If the well search identifies homes or businesses that are not connected to the AWWU water system, field staff will make a reasonable attempt to contact the owners or occupants to inquire about their water source. Site visits or telephone calls will be made to each likely well location to verify the property's water supply. Using a Water Supply Well Inventory Survey Form (Appendix B of the GWP), Shannon & Wilson will verify the presence or absence of a water supply well on the property and obtain pertinent well related information. Please note, not approaching properties identified by AWWU could result in missing secondary water supply wells used for industrial or non-potable purposes.

## 4 REFERENCES

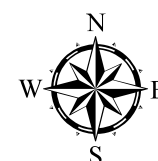
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**Legend**

- Ted Stevens Anchorage International Airport Property Boundary
- Historic AFFF Releases
- Former Kulis Air National Guard Base
- Former Kulis Air National Guard Base Water Well Study Area
- Ted Stevens Anchorage International Airport Water Supply Well Search Area



Ted Stevens Anchorage International Airport  
Anchorage, Alaska

**SITE PLAN**

April 2021

106189-001

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

**FIG. 1**

# 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**