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FINAL

SUMMARY REPORT

June 2022 Annual Water Supply Well Monitoring

ILIAMNA, ALASKA

SHANNON & WILSON

October 2022

Shannon & Wilson No: 105201-005

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Submitted To: Alaska Department of Transportation & Public Facilities
PO Box 112506
Juneau, AK 99811-2506
Attn: Sammy Cummings and Spencer Gates

Subject: FINAL SUMMARY REPORT, JUNE 2022 ANNUAL
WATER SUPPLY WELL MONITORING, ILIAMNA, ALASKA

Shannon & Wilson, Inc. (S&W) has prepared this report to summarize the water supply well monitoring efforts performed in June 2022 near the Iliamna Airport in Iliamna, Alaska. The services were conducted on behalf of the Alaska Department of Transportation & Public Facilities (DOT&PF). S&W's scope of services was specified in a proposal dated April 15, 2021, and authorized on June 8, 2021, by the DOT&PF under *Professional Services Agreement Number 25-19-1-013 Per- and Polyfluoroalkyl Substances (PFAS) Related Environmental & Engineering Services.* This report was prepared for the DOT&PF in accordance with the terms and conditions of S&W's contract, relevant Alaska Department of Environmental Conservation guidance documents, and Title 18 of the Alaska Administrative Code Chapter 75.335.

S&W appreciates the opportunity to be of service to the DOT&PF on this project. If there are questions concerning this report, please contact us.

Sincerely,

SHANNON & WILSON, INC.

For Justin Risley

Justin Risley
Engineering Staff
Role: Primary Author

Ashley Jaramillo
Senior Chemist
Role: Project Manager

AMJ:CBD/jkr

CONTENTS

CONTENTS

Exhibits

Tables

Figures

Appendices

ACRONYMS

AAC	Alaska Administrative Code
AFFF	aqueous film forming foam
ARFF	aircraft rescue and firefighting
bgs	below ground surface
°C	degrees Celsius
CSP	Contaminated Sites Program
DEC	Alaska Department of Environmental Conservation
DONA	4,8-dioxa-3H-perfluorononanoic acid
DOT&PF	Alaska Department of Transportation & Public Facilities
EPA	U.S. Environmental Protection Agency
Eurofins	Eurofins Environment Testing America
HFPO-DA	hexafluoropropylene oxide dimer acid
ILI	Iliamna Airport
LDRC	Laboratory Data Review Checklist
LHA	Lifetime Health Advisory
ng/L	nanograms per liter
N-EtFOSAA	N-ethyl perfluorooctane sulfonamidoacetic acid
N-MeFOSAA	N-methyl perfluorooctane sulfonamidoacetic acid
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PFTeA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnA	perfluoroundecanoic acid
ppt	parts per trillion
QA	quality assurance
QC	quality control
S&W	Shannon & Wilson, Inc.
WO	work order
YSI	multiprobe water quality meter
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid

1 INTRODUCTION

Shannon & Wilson, Inc. (S&W) has prepared this summary report to document water supply well sampling efforts near the Iliamna Airport (ILI) in Iliamna, Alaska. This report describes the sampling event conducted by S&W in June 2022. The Alaska Department of Environmental Conservation (DEC) Contaminated Sites Program (CSP) database lists the status of the ILI per- and polyfluoroalkyl substances (PFAS) site as "informational" due to the presence of below-regulatory level PFAS concentrations in water supply well samples collected at and near the ILI (DEC File Number 2560.38.013, Hazard ID 27265).

1.1 Purpose and Objective

The purpose of the services described in this report was to evaluate the potential for human exposure to PFAS-containing groundwater in water supply wells at and near the ILI. S&W's objectives were to collect annual analytical groundwater samples from three previously sampled water supply wells that meet the monitoring criteria discussed in Section 2.7. As described in Section 2.8, we were able to sample only two of these wells. The scope of services implemented to achieve these objectives is defined in Section 1.2 below.

1.2 Scope of Services

S&W's scope of services summarized in this report include an annual water supply well monitoring event and public outreach support. This report includes data from the water supply well monitoring event conducted in June 2022. This project is ongoing; planned future work is summarized in Section 6.

This report was prepared for the exclusive use of the Alaska Department of Transportation & Public Facilities (DOT&PF) and its representatives. This work presents S&W's professional judgment as to the conditions of the site. Information presented here is based on activities S&W performed. This report should not be used for other purposes without S&W's approval or if any of the following occurs:

- Project details change, or new information becomes available, such as revised regulatory levels or the discovery of additional source areas.
- Conditions change due to natural forces or human activity at, under, or adjacent to the project site.
- Assumptions stated in this report have changed.
- If the site ownership or land use has changed.

- Regulations, laws, or cleanup levels change.
- If the site's regulatory status has changed.

If any of these occur, S&W should be retained to review the applicability of our recommendations. This report should not be used for other purposes without S&W's review. If a service is not specifically indicated in this report, do not assume it was performed.

1.3 Site Location

The ILI is located at 1 Airport Road in Iliamna, Alaska. The City of Iliamna is located on the northwest shore of Lake Iliamna. Iliamna is a part of the Lake and Peninsula Borough, which occupies most of the Alaska Peninsula. Iliamna lies approximately 200 miles southwest of Anchorage. The geographic coordinates of the ILI apron are latitude 59.7559° N, longitude -154.9075° W.

1.4 Geology and Hydrology

Iliamna is located on a lake terrace north of Lake Iliamna. Two dominant surficial deposits have been mapped in the Iliamna area, including lake terrace and beach ridge deposits. Volcanic ash and beach sediment are also present within the lake terrace.

Unconfined groundwater in the Iliamna area has been found to range in depth from about 18 feet below ground surface (bgs) to greater than 50 feet bgs.

2 BACKGROUND

This section discusses the previous activities at the ILI.

2.1 Site History

The ILI is a former Title 14, Code of Federal Regulations, Part 139 airport, which required specific certification through the Federal Aviation Administration (FAA). This certification required, among other things, aircraft rescue and firefighting (ARFF) infrastructure and capabilities to ensure safety in air transportation. As part of this certification, Part 139 airports are required to conduct annual training for emergency response situations using aqueous film forming foam (AFFF) and demonstrate compliance with federal regulations. Prior to 2019 these annual training events occurred on the ground surface. The FAA lifted the requirement to use PFAS-containing AFFF during training exercises at the beginning of

2019; alternate FAA-approved testing units have been implemented to test fire apparatus systems without discharging AFFF to the ground surface.

2.2 AFFF Use at the Iliamna Airport

PFAS-containing AFFF has been known to be stored and used for emergency and training purposes at various locations on the ILI property, see Figure 1. We understand there are no longer ARFF vehicles or AFFF at the ILI.

2.3 PFAS Regulatory History

AFFF contains PFAS, a category of persistent organic compounds considered emerging environmental contaminants with evidence that exposure to PFAS can lead to adverse health effects. Perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) are two PFAS commonly found at sites where AFFF has been used. Due to their persistence, toxicity, and bioaccumulative potential, these compounds are of increasing concern to environmental and health agencies. The U.S. Environmental Protection Agency (EPA) published a Lifetime Health Advisory (LHA) level for PFOS and PFOA in drinking water in May 2016 of 70 nanograms per liter (ng/L) for the sum of PFOS and PFOA. The DEC CSP published groundwater cleanup levels for PFOS and PFOA in November 2016 of 400 ng/L for each compound individually. Prior to the publication of these levels, there were no state level cleanup levels established for PFAS.

On August 20, 2018, the DEC CSP published a Technical Memorandum outlining a new action level for the sum of five PFAS (PFOA, PFOS, perfluorohexanesulfonic acid [PFHxS], perfluoroheptanoic acid [PFHpA], and perfluorononanoic acid [PFNA]) in drinking water. The action levels proposed in the August 2018 Technical Memorandum were submitted as proposed regulation. PFAS projects for the State of Alaska adopted the proposed regulatory action level from August 2018 to March 2019, per DEC direction. On April 9, 2019, DEC issued an amendment to its August 20, 2018 Technical Memorandum to align DEC's action level with the EPA LHA of 70 ng/L for the sum of PFOS and PFOA. On October 2, 2019, DEC published a Technical Memorandum amending the April 9, 2019 Technical Memorandum and adding an additional testing requirement to analyze for and report all analytes for the appropriate PFAS analytical method, although the action level remains 70 ng/L for the sum of PFOS and PFOA.

We understand the DEC is currently evaluating the interim PFAS LHAs released by EPA in June 2022 to determine their impact on DOT&PF PFAS projects and other projects in the State of Alaska.

2.4 Contaminants of Concern and Action Levels

The primary contaminants of concern for the ILI PFAS site are PFOS and PFOA. For the purposes of this project, samples were submitted for analytical method EPA Method 537.1 which includes the following list of 18 PFAS, aligning with the DEC's October 2019 Technical Memorandum.

- PFOS
- PFOA
- PFHpA
- PFNA
- PFHxS
- perfluorobutanesulfonic acid (PFBS)
- perfluorodecanoic acid (PFDA)
- perfluorododecanoic acid (PFDoA)
- perfluorohexanoic acid (PFHxA)
- perfluorotetradecanoic acid (PFTeA)
- perfluorotridecanoic acid (PFTrDA)
- perfluoroundecanoic acid (PFUnA)
- hexafluoropropylene oxide dimer acid (HFPO-DA)
- N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)
- N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)
- 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
- 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)
- 4,8-dioxa-3H-perfluorononanoic acid (DONA)

Of these PFAS, only PFOS and PFOA are regulated with numeric action levels or cleanup levels, as summarized in Exhibit 2-1 below.

Exhibit 2-1: Applicable Regulatory Action Levels

Media	Analyte	Action Level
Drinking Water[1]	PFOS + PFOA	70 ng/L
Groundwater[2]	PFOS	400 ng/L
	PFOA	400 ng/L
Soil[3]	PFOS	3.0 µg/kg
	PFOA	1.7 µg/kg

Notes:

1 Drinking water action level reported in the DEC October 2019 Technical Memorandum

2 DEC groundwater cleanup level reported in 18 AAC 75.345, Table C.

3 DEC migration to groundwater soil cleanup levels reported in 18 AAC 75.341, Table B1.

AAC = Alaska Administrative Code, DEC = Alaska Department of Environmental Conservation, PFOA = perfluorooctanoic acid, PFOS = perfluorooctanesulfonic acid; µg/kg = micrograms per kilogram, ng/L = nanograms per liter

2.5 PFAS Discovery at the ILI

In late 2018, as part of a Cooperative Agreement with the EPA, the DEC CSP conducted a limited PFAS Site Discovery Investigation. This included identifying potentially PFAS impacted communities in Alaska, conducting a risk analysis of identified communities, collecting water supply well samples for the analysis of PFAS, and reporting those results. The ILI was identified as a potentially PFAS affected site and DEC staff located and sampled nine water supply wells at and near the ILI in June 2020. None of the water supply wells sampled had PFAS concentrations exceeding the LHA. S&W reviewed the analytical data provided by the DEC and performed an internal quality assurance/quality control (QA/QC) assessment and completed a DEC Laboratory Data Review Checklist (LDRC).

2.6 2020 Water Supply Well Search and Sampling Event

In early November of 2020, S&W began the initial water supply well search and survey at and near the ILI. Based on the information available and in coordination with the DOT&PF and DEC, a well search area was defined prior to the sampling event (Figure 1). Owners/users of the properties identified in the search area were contacted, where practicable, to determine the presence or absence of a water supply well on the property and obtain pertinent information on the well. We identified 16 properties with water supply wells.

In late November 2020, S&W performed the initial sampling event. During this event an attempt was made to contact the owner or occupant of each identified property in the search area. If occupants were not present at the time the property was visited, personalized door tags were left in a location where it would be noticed. We collected samples from 11 water

supply wells from those identified during the well search and survey. Of the 11 wells sampled, three met the criteria (Section 2.7) for annual monitoring, *ILI-001, ILI-006*, and *ILI-013*. Table 1 summarizes the PFAS analytical results from the November 2020 event.

2.6.1 Water Supply Well Categories

Water supply wells were categorized by use as follows based on information provided by the water supply well owner/user.

- Category 1: water supply wells used for drinking or cooking, as reported by owners or occupants.
- Category 2: water supply wells used for dish washing, bathing, and other domestic purposes. Homes or businesses where the occupants report they do not drink the water, but where the water supply wells lead to kitchen or bathroom faucets, are considered possible future drinking water wells.
- Category 3: water supply wells used for vegetable gardening and are not plumbed to indoor faucets or spigots. The well water is not accessed by outdoor plumbing, but the well may be located underneath or inside the structure. These wells are considered non-drinking water wells.
- Category 4: water supply wells used for outdoor purposes only, such as irrigation or vehicle washing. These wells are considered non-drinking water wells.
- Category 5: water supply wells currently not in use. Wells that have been abandoned in place, are inoperable, disconnected, or intended for future use. These wells are considered non-drinking water wells.

Water supply wells are categorized in this manner to facilitate sorting of wells by use and provide s level of priority. Wells in Categories 1 and 2 are given a higher priority with respect to alternative water and additional monitoring.

2.7 Water Supply Well Monitoring Criteria and Schedule

In coordination with the DOT&PF and DEC, S&W established the following annual water supply well monitoring criteria for the ILI the November 2020 sampling event based on DEC guidance documents and technical memorandums.

- Annual Criteria
  - Active category 1 and 2 water supply wells with a maximum combined PFOS and PFOA concentration greater than or equal to 17.5 ng/L during a previous sampling event, per DEC guidance; and

- Active category 1 and 2 water supply wells within 500 lateral feet of water supply wells with a combined PFOS and PFOA concentration greater than or equal to 17.5 ng/L during a previous sampling event.

Lateral distance was measured from the GPS points collected during the November 2020 sampling event.

2.8 June 2021 Annual Water Supply Well Monitoring Event

The first annual monitoring event for the ILI occurred in June 2021. Three wells met the annual sampling criteria; only two of the wells were sampled, *ILI-001* and *ILI-013*. A sample was not collected from well *ILI-006* because the building housing was winterized and not receiving power. PFAS results were reported within annual monitoring criteria (Section 2.7). See Table 2 for 2021 PFAS results.

3 FIELD ACTIVITIES

S&W conducted the second annual water supply well sampling event in June 2022. Rachel Willis, an environmental scientist with Shannon & Wilson's Fairbanks office, collected analytical water samples for this project. Ms. Willis is a State of Alaska Qualified Sampler as defined in 18 Alaska Administrative Code (AAC) 75.333[b] and 18 AAC 78.088[b].

S&W sampled two unique water supply wells in June 2022, *ILI-001* and *ILI-013*. The building housing well *ILI-006* was still winterized and not receiving power; therefore, a sample was not collected during the June 2022 event.

S&W collected water supply well samples from a location in the structure's plumbing upstream of water-treatment systems or water softeners, where possible. For the purposes of this project S&W does not consider small (i.e., less than 18 inches in height) particulate filters to be PFAS treatment systems.

S&W purged the water supply well systems prior to sampling by allowing the water to run until water parameters stabilized and the water appeared clear. Purging for approximately 20 minutes, parameters were collected using a multiprobe water quality meter (YSI). The parameters pH, temperature, and conductivity were recorded approximately once every three minutes until sample collection. The following values were used to indicate stability for a minimum of three consecutive readings: ±0.1 pH, ±0.5 degrees Celsius (°C) temperature, and ±3 percent conductivity (microsiemens per centimeter).

S&W discharged purge water to an indoor sink or to the ground surface. Following parameter stabilization, S&W collected PFAS water samples using laboratory-supplied containers. Copies of the Water Supply Well Sampling Logs are included in Appendix A, Field Forms.

3.1 Sample Custody, Storage, and Transport

Immediately after collection, the sample bottles for each water supply well were placed in Ziploc bags and stored in a designated sample cooler maintained between 0 °C and 6 °C with ice substitute separated from the sample bottles by a liner bag. S&W maintained custody of the samples until submitting them to the laboratory for analysis. Analytical samples and chain-of-custody forms were packaged for shipping in a hard-plastic cooler with an adequate quantity of frozen-ice substitute and packing material to maintain the proper temperature and prevent bottle breakage. S&W field staff applied custody seals to the cooler, which were observed to be intact upon receipt by the laboratory. Field staff shipped sample coolers to Eurofins Environment Testing America (Eurofins) in West Sacramento, California for analysis of PFAS by EPA Method 537.1.

3.2 Special Considerations for PFAS Sampling

S&W field staff took appropriate precautions to prevent cross contamination during sampling, including discontinuing the use of personal protective equipment and field supplies known to contain PFAS, using liner bags to contain samples before and after sample collection, hand washing, and donning a fresh pair of disposable nitrile gloves before sample collection.

3.3 Notification of Results

Following review and validation of the analytical data, S&W prepared an analytical data table for the project team (DOT&PF, DEC, and DOS) and then called property owners and occupants to notify them of the results of the PFAS water testing.

S&W also prepared letters for owners and occupants informing them of the results for the sample collected from their well. These letters were tailored to each property and analytical sample, and included the following information:

- sample name;
- comparison of analytical results to DEC's current action levels;
- description of the project; and

- pages of the Eurofins laboratory report that apply to the owner or occupant's water supply well sample, including other PFAS results.

Where requested, S&W emailed result letters to owners and/or occupants.

Appendix B includes the result notification letter template and other information provided to well owners/users in June 2022.

3.4 Public Information

The DOT&PF hosts a webpage (https://dot.alaska.gov/airportwater/) describing the PFAS testing project. The webpage includes simplified regional results maps, a project summary, list of contacts, and links to additional resources. The map is updated after each sampling event following the receipt of analytical data.

3.5 Deviations

In general, S&W conducted the work in accordance with the sampling procedures noted above, and based on ongoing discussion with DEC and DOT&PF. There are no deviations from the procedures described in Section 3.

4 ANALYTICAL RESULTS

Table 3 summarizes the PFAS concentrations for samples collected from water supply wells during the June 2022 sampling event. Samples were submitted for analysis by EPA Method 537.1. None of the samples exceeded the LHA of 70 ng/L for the sum of PFOS and PFOA. However, PFAS results were within annual monitoring criteria (Section 2.7).

The Eurofins work order (WO) is followed by the LDRC in Appendix C. The highest reported water supply well PFAS analytical results for all wells sampled to date are shown on Figure 1. The results for the June 2022 event are shown in Figure 2.

5 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC procedures assist in producing data of acceptable quality and reliability. S&W reviewed the analytical results provided by Eurofins for laboratory QC samples and conducted our own QA assessment for this project in accordance with the DEC approved Data-Validation Program Plan included as a part of the GWP. S&W completed an LDRC for

the PFAS WO. This LDRC is included in Appendix C after the corresponding analytical report.

By working in accordance with the proposed scope of services, S&W considers the samples collected to be representative of site conditions at the locations and times they were obtained. The quality of the analytical data for this project does not appear to have been compromised, and those results affected by QC anomalies were qualified with appropriate flags, as needed. See Appendix D for our QA/QC summary of the analytical data.

6 FUTURE WORK

S&W submitted a proposal to DOT&PF for an annual PFAS water supply well sampling event to be completed in June 2023.

7 RECOMMENDATIONS

Based on the previously completed work, S&W recommends the DOT&PF continue to:

- re-evaluate sample results for impacted properties following updates to DEC action levels;
- attempt to sample wells meeting the sampling criteria; and
- work with the DEC and the Alaska Department of Health to continue educating the public regarding the potential health effects of exposure to PFAS containing water, as new information becomes available.

The information included in this report is based on limited sampling and should be considered representative of the times and locations at which the sampling occurred. Regulatory agencies may reach different conclusions than S&W. *Important Information about your Environmental Report* has been prepared and included as an Appendix to assist you and others in understanding the use and limitations of this report.

8 REFERENCES

Alaska Department of Environmental Conservation (DEC), 2017, Site characterization work plan and reporting guidance for investigation of contaminated sites: Juneau, Alaska, DEC Division of Spill Prevention and Response, Contaminated Sites Program, March, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.

Alaska Department of Environmental Conservation (DEC), 2019a, 18 AAC 75, Oil and other hazardous substances pollution control: Juneau, Alaska, Alaska Administrative Code (AAC), Title 18, Chapter 75, January available: http://dec.alaska.gov/commish/regulations/.

Alaska Department of Environmental Conservation (DEC), 2019b, 18 AAC 75.341, Soil cleanup levels: Juneau, Alaska, Alaska Administrative Code (AAC), Title 18, Chapter 75, Section 341, January, available: http://dec.alaska.gov/commish/regulations/.

Alaska Department of Environmental Conservation (DEC), 2019c, 18 AAC 80, Drinking water: Juneau, Alaska, Alaska Administrative Code (AAC), Title 18, Chapter 80, May, available: http://dec.alaska.gov/eh/dw/regulations.

Alaska Department of Environmental Conservation (DEC), 2019d, Field sampling guidance for contaminated sites and leaking underground storage tanks: Juneau, Alaska, DEC Division of Spill Prevention and Response, Contaminated Sites Program, October, available: http://dec.alaska.gov/spar/csp/guidance_forms/csguidance.htm.

Alaska Department of Environmental Conservation (DEC), 2019e, Technical memorandum - action levels for PFAS in water and guidance on sampling groundwater and drinking water (updated): Juneau, Alaska, DEC Division of Spill Prevention and Response Contaminated Sites Program and Division of Environmental Health Drinking Water Program, 4 p., October 2.

U.S. Environmental Protection Agency (EPA), 2016, Drinking water health advisory for perfluorooctanoic acid (PFOA): Washington, D.C., U.S. EPA Office of Water, Health and Ecological Criteria Division, EPA 822-R-16-005, May, available: https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf

Hall, J.D., 1995, Overview of environmental and hydrogeologic conditions at Iliamna, Alaska: U.S. Geological Survey Open-File Report 95-346, 66 p.

Table 1 — November 2020 Initial PFAS Sampling Event Results

Analyte	EPA LHA	Units	ILI-001	ILI-003	ILI-004		ILI-006	ILI-008	ILI-009		ILI-012	ILI-013	ILI-023	ILI-030	ILI-031
			ILI-001	*ILI-003*	*ILI-004*	*ILI-904*	*ILI-006*	*ILI-008*	*ILI-009*	*ILI-909*	*ILI-012*	*ILI-013*	*ILI-023*	*ILI-030*	*ILI-031*
Perfluorohexanesulfonic acid (PFHxS)	N/A	ng/L	21	<1.9	18	19	15	0.86 J	30	29	19	30	<1.9	<1.9	<1.9
Perfluorohexanoic acid (PFHxA)	N/A	ng/L	3.9	<1.9	2.9	3.3	4.0	<1.9	1.4 J	1.4 J	3.1	4.5	<1.9	<1.9	<1.9
Perfluoroheptanoic acid (PFHpA)	N/A	ng/L	0.67 J	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	0.57 J	<1.9	<1.9	<1.9
Perfluorononanoic acid (PFNA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Perfluorobutanesulfonic acid (PFBS)	N/A	ng/L	6.1	<1.9	4.8	4.7	5.2	<1.9	6.6	6.7	4.9	8.0	<1.9	<1.9	<1.9
Perfluorodecanoic acid (PFDA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Perfluoroundecanoic acid (PFUnA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Perfluorododecanoic acid (PFDoA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Perfluorotridecanoic acid (PFTrDA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Perfluorotetradecanoic acid (PFTeA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Hexafluoropropylene oxide dimer acid (HFPO-DA)	N/A	ng/L	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9
Perfluorooctanesulfonic acid (PFOS)	70†	ng/L	15	<1.9	16	16	10	<1.9	18	18	16	25	<1.9	<1.9	<1.9
Perfluorooctanoic acid (PFOA)		ng/L	0.51 J	<1.9	0.69 J	0.74 J	0.60 J	<1.9	<1.9	<1.9	0.69 J	0.98 J	<1.9	<1.9	<1.9
LHA Combined (PFOS + PFOA)	70†	ng/L	16 J	—	17 J	17 J	11 J	—	18 ‡	18 ‡	17 J	26 J	—	—	—

Notes: Sample *ILI-904* and sample *ILI-909* are field duplicate samples of *ILI-004* and of *ILI-009* , respectively.

Results reported from Eurofins Environment Testing America work order 320-66626-1.

† EPA LHA level of 70 ppt for PFOS and PFOA combined is referenced.

‡ Minimum concentration, the LHA combined concentration includes one or more result that is not detected greater than the MDL.

N/A No applicable regulatory limit exists for the associated analyte.

— The sum of non-detected values cannot be calculated.

< Analyte not detected; listed as less than the limit of quantitation unless otherwise flagged due to quality-control failures.

J Estimated concentration, detected greater than the MDL and less than the reporting limit. Flag applied by the laboratory.

EPA = United States Environmental Protection Agency; MDL = method detection limit; PFAS = per- and poly-fluoroalkyl substances; ng/L = nanograms per liter

Table 2 - Annual Water Supply Well Historical Analytical PFAS Results

Analyte	EPA LHA	Units	June 2021			
			ILI-001		ILI-007	ILI-013
			ILI-001	*ILI-901*	*ILI-007*	*ILI-013*
Perfluorohexanesulfonic acid (PFHxS)	-	ng/L	20 J*	20 J*	0.62 J	27 J*
Perfluorohexanoic acid (PFHxA)	-	ng/L	7.3 J*	6.9 J*	<1.9	4.6 J*
Perfluoroheptanoic acid (PFHpA)	-	ng/L	0.92 J*	0.89 J*	<1.9	0.63 J*
Perfluorononanoic acid (PFNA)	-	ng/L	<1.8 J*	<1.8 J*	0.38 J	<1.9 J*
Perfluorobutanesulfonic acid (PFBS)	-	ng/L	5.4 J*	5.3 J*	<1.9	7.3 J*
Perfluorodecanoic acid (PFDA)	-	ng/L	<1.8 J*	<1.8 J*	<1.9	<1.9 J*
Perfluoroundecanoic acid (PFUnA)	-	ng/L	<1.8 J*	<1.8 J*	<1.9	<1.9 J*
Perfluorododecanoic acid (PFDoA)	-	ng/L	<1.8 J*	<1.8 J*	<1.9	<1.9 J*
Perfluorotridecanoic acid (PFTrDA)	-	ng/L	<1.8 J*	<1.8 J*	<1.9	<1.9 J*
Perfluorotetradecanoic acid (PFTeA)	-	ng/L	<1.8 J*	<1.8 J*	<1.9	<1.9 J*
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	ng/L	<4.6 J*	<4.6 J*	<4.8	<4.7 J*
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	ng/L	<4.6 J*	<4.6 J*	<4.8	<4.7 J*
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	ng/L	<1.8 J*	<1.8 J*	<1.9	<1.9 J*
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	ng/L	<1.8 J*	<1.8 J*	<1.9	<1.9 J*
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	ng/L	<1.8 J*	<1.8 J*	<1.9	<1.9 J*
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	ng/L	<3.7 J*	<3.7 J*	<3.8	<3.7 J*
Perfluorooctanesulfonic acid (PFOS)	70†	ng/L	17 J*	17 J*	<1.9	29 J*
Perfluorooctanoic acid (PFOA)		ng/L	1.3 J*	1.2 J*	<1.9	1.3 J*
LHA Combined (PFOS + PFOA)	70†	ng/L	18 J*	18 J*	n/a	30 J*

Notes:
Sample *ILI-901* is a field-duplicate of sample *ILI-001* .
Results reported from Eurofins Environment Testing America work order 320-74692-1.

† EPA LHA level is 70 ppt for PFOS and PFOA

< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.

J Estimated concentration, detected greater than the MDL and less than the RL. Flag applied by the laboratory.

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

EPA = Environmental Protection Agency; LHA = Lifetime Health Advisory; n/a = not applicable; ppt = parts per trillion

Table 3 - June 2022 Water Supply Well PFAS Analytical Results

Analyte	EPA LHA	Units	ILI-001		ILI-013
			ILI-001	*ILI-101*	*ILI-013*
Perfluorohexanesulfonic acid (PFHxS)	N/A	ng/L	19	21	28
Perfluorohexanoic acid (PFHxA)	N/A	ng/L	5.3	5.2	4.8
Perfluoroheptanoic acid (PFHpA)	N/A	ng/L	0.53 J	0.52 J	0.60 J
Perfluorononanoic acid (PFNA)	N/A	ng/L	<1.9	<1.8	<1.9
Perfluorobutanesulfonic acid (PFBS)	N/A	ng/L	6.8	7.1	9.1
Perfluorodecanoic acid (PFDA)	N/A	ng/L	<1.9	<1.8	<1.9
Perfluoroundecanoic acid (PFUnA)	N/A	ng/L	<1.9	<1.8	<1.9
Perfluorododecanoic acid (PFDoA)	N/A	ng/L	<1.9	<1.8	<1.9
Perfluorotridecanoic acid (PFTrDA)	N/A	ng/L	<1.9	<1.8	<1.9
Perfluorotetradecanoic acid (PFTeA)	N/A	ng/L	<1.9	<1.8	<1.9
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	N/A	ng/L	<1.9	<1.8	<1.9
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	N/A	ng/L	<1.9	<1.8	<1.9
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	N/A	ng/L	<1.9	<1.8	<1.9
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	N/A	ng/L	<1.9	<1.8	<1.9
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	N/A	ng/L	<1.9	<1.8	<1.9
Hexafluoropropylene oxide dimer acid (HFPO-DA)	N/A	ng/L	<1.9	<1.8	<1.9
Perfluorooctanesulfonic acid (PFOS)	70†	ng/L	11	12	24
Perfluorooctanoic acid (PFOA)		ng/L	0.77 J	0.65 J	1.1 J
LHA Combined (PFOS + PFOA)	70†	ng/L	12 J	13 J	25 J

Notes: Sample *ILI-101* is a field duplicate sample of *ILI-001* .

Results reported from Eurofins Environment Testing America work order 320-88822-1.

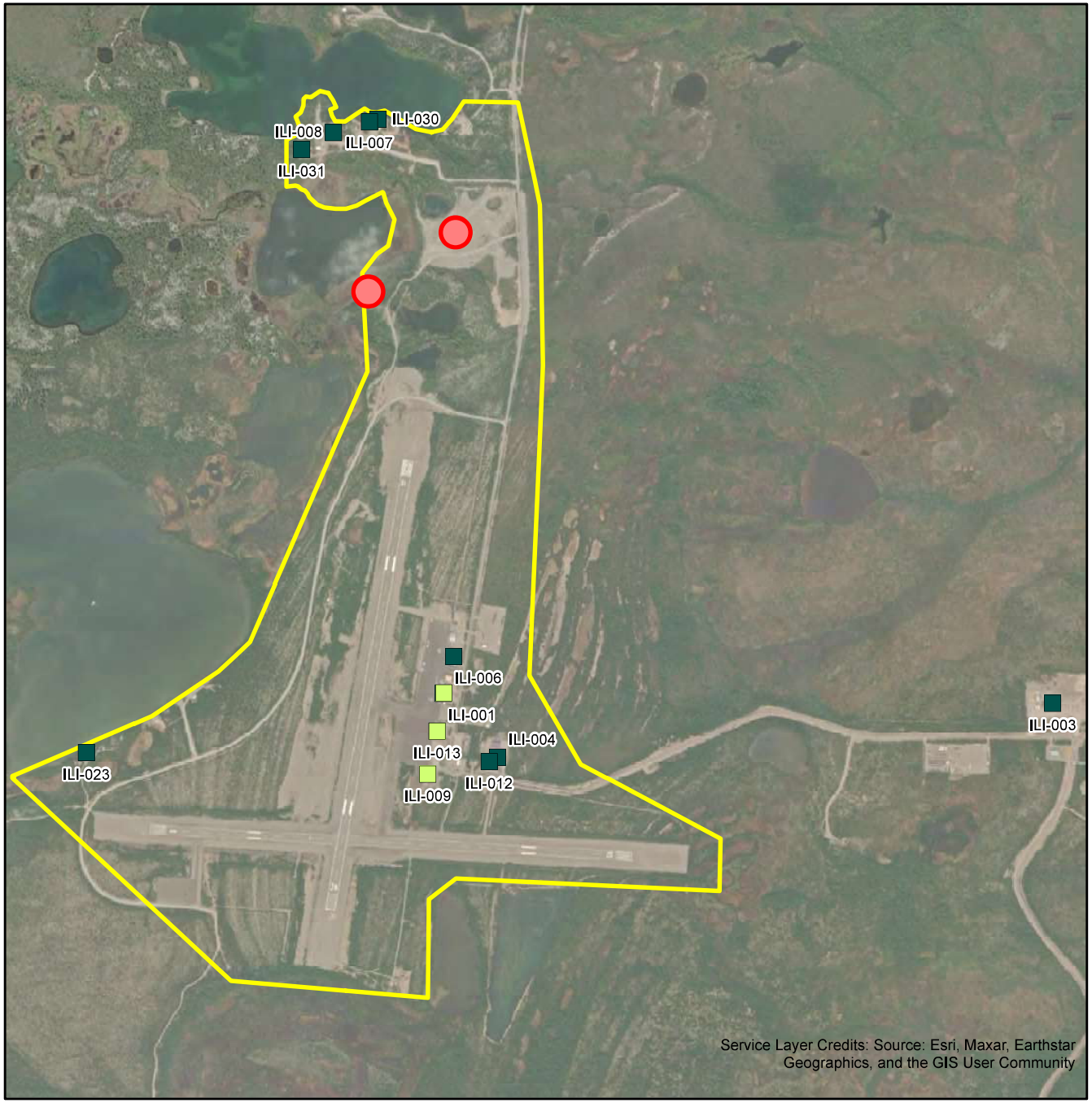
† EPA LHA level of 70 ppt for PFOS and PFOA combined is referenced.

N/A No applicable regulatory limit exists for the associated analyte.

< Analyte was not detected; reported as <Reporting Limit (RL).

J Estimated concentration, detected greater than the MDL and less than the RL. Flag applied by the laboratory.

EPA = United States Environmental Protection Agency; MDL = method detection limit; PFAS = per- and poly-fluoroalkyl substances; ng/L = nanograms per liter



LEGEND

Sum of PFOS and PFOA:

- ≤ 17 parts per trillion (ppt)
- 18 to 69 ppt
- ≥ 70 ppt
- Well Search Area
- Past Aqueous Film Forming Foam (AFFF) Use

0 0.25 0.5

Miles

N

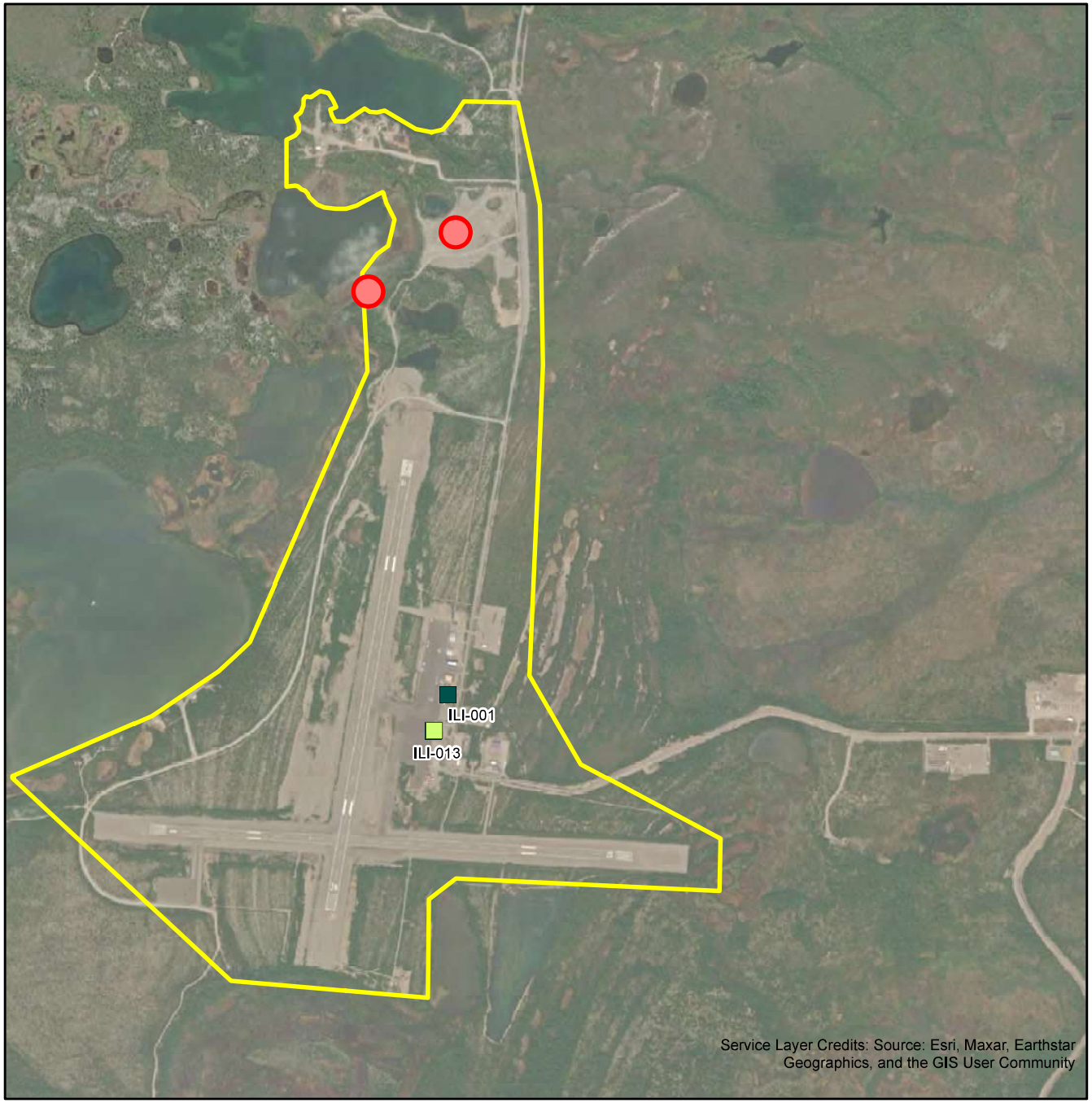
Iliamna Airport
Iliamna, Alaska

HIGHEST WATER SUPPLY WELL ANALYTICAL RESULTS THROUGH JUNE 2022

October 2022 105201-005

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1



LEGEND

Sum of PFOS and PFOA:

- ≤ 17 parts per trillion (ppt)
- 18 to 69 ppt
- ≥ 70 ppt
- Well Search Area
- Past Aqueous Film Forming Foam (AFFF) Use

N

0 0.25 0.5

Miles

Iliamna Airport
Iliamna, Alaska

JUNE 2022 WATER SUPPLY
WELL ANALYTICAL RESULTS

October 2022 105201-005

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure **2**

APPENDIX A: FIELD FORMS

Appendix A

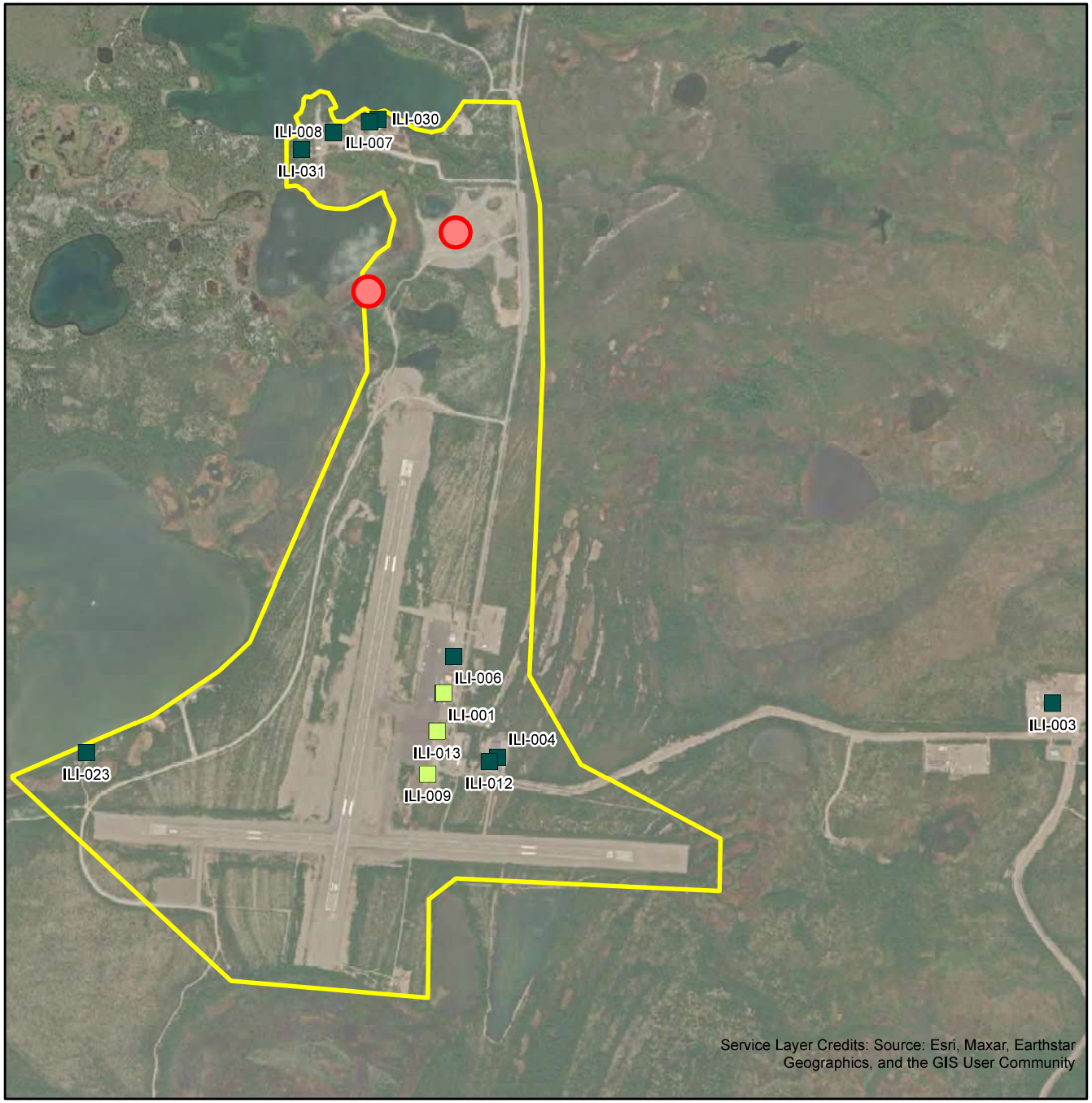
Field Forms - **REDACTED FOR PRIVACY**

APPENDIX B: PUBLIC INFORMATION

Appendix B

Public Information

CONTENTS



LEGEND

Sum of PFOS and PFOA:

- ≤ 17 parts per trillion (ppt)
- 18 to 69 ppt
- ≥ 70 ppt
- Well Search Area
- Past Aqueous Film Forming Foam (AFFF) Use

0 0.25 0.5

Miles

N

Iliamna Airport
Iliamna, Alaska

HIGHEST WATER SUPPLY WELL ANALYTICAL RESULTS JUNE 2022

June 2022 105201-005

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Transportation and Public Facilities

DIVISION OF STATEWIDE AVIATION

P.O. Box 196900, 99519-6900
4111 Aviation Avenue, 99502
Anchorage, AK
Main: 907.269.0730
Fax: 907.269.0489
dot.state.ak.us

PFAS Fact Sheet – Iliamna Airport

October 2020

Per- and polyfluoroalkyl substances (PFAS) are a group of manmade chemicals used for a wide variety of residential, commercial, and industrial uses. PFAS are considered emerging environmental contaminants and the health effects are not well known. PFAS are used in a large number of consumer products ranging from fabric waterproofing compounds, non-stick cookware, stain resistant carpeting, some food packaging and firefighting foams.

The presumed source of PFAS in groundwater in your community is the use of a fire-fighting foam called aqueous film forming foam (AFFF). Airport firefighters used the foam to extinguish petroleum fires during training exercises and emergency events.

The Alaska Department of Transportation & Public Facilities (DOT&PF) has hired Shannon & Wilson to test water supply wells near the airport for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and other PFAS compounds. Much of the well search area is served by the Nome Joint Utility System and may not have wells.

The U.S. Environmental Protection Agency (EPA) lifetime health advisory (LHA) level for drinking water is **70 parts per trillion** for the sum of PFOS and PFOA, two compounds within the PFAS family.

We advise residents with test results above this level not to use their water for drinking or cooking. If your well is considered affected, you can continue to shower, clean, and do laundry.

Test results are typically available within three to four weeks of sample collection. If your well is found to have PFAS above the EPA LHA, DOT&PF will assist with access to an alternate source of drinking water.

Website: www.dot.alaska.gov/airportwater/

For questions about well testing:
Shannon & Wilson, Inc.
Ashley Jaramillo, Project Manager
Office Phone: 907-458-3118
Email: amj@shanwil.com

For regulatory questions:
Alaska Dept. of Environmental Conservation
Bill O'Connell, Contaminated Sites Program
Phone: 907-269-3057
Email: bill.oconnell@alaska.gov

For questions about PFAS and health effects:
Alaska Dept. of Health & Social Services
Sarah Yoder, Public Health Specialist
Phone: 907-269-8054
Email: sarah.yoder@alaska.gov

To file an insurance claim:
Division of Risk Management
Ken Simpson, Claims Administrator
Phone: 907-465-2183
Email: ken.simpson@alaska.gov

For questions about fire training & other inquiries:
DOT&PF – Statewide Aviation
Sammy Cummings, PFAS Program Manager
Phone: 907-888-5671
Email: airportwater@alaska.gov

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

June 21, 2022

Full Name/s
Mailing Address
City, AK xxxxx

RE: RESULTS OF JUNE 2022 PFAS WATER SUPPLY WELL SAMPLING, ILIAMNA AIRPORT

Thank you for participating in our water supply well sampling program to evaluate the potential presence of per- and polyfluoroalkyl substances (PFAS) in groundwater near the Iliamna Airport. Shannon & Wilson, Inc. collected a water sample on June X, 2022, from your water supply well. Enclosed are the analytical results for the sample from your water supply well. We have prepared an identical letter for your tenant/s NAME.

The well-water sample was analyzed for perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), and other PFAS compounds. We compare these concentrations to the U.S. Environmental Protection Agency's (EPA) health advisory level for drinking water. The lifetime health advisory level is 70 parts per trillion (ppt) for the sum of PFOS and PFOA. Please note that these units are equivalent to nanograms per liter (ng/L).

Results of the analysis conducted by Eurofins TestAmerica Laboratories, Inc. indicate that PFOS was not/was detected at X ppt, and PFOA was not/was detected at X ppt in the water sample from your well. The sum of these PFOS and PFOA concentrations is less than/greater than the lifetime health advisory level. The portions of the original laboratory report that apply to your well (sample number *XXXXXX* and field-duplicate sample *XXXXXX*) are enclosed for your records.

The Alaska Department of Transportation and Public Facilities (DOT&PF) will provide an alternate source of drinking water to the occupants of homes and businesses whose well water exceeds the health advisory level, and who use their water for drinking or cooking.

We have sampled over 10 water supply wells near the Iliamna Airport on behalf of DOT&PF. Please see the enclosed PFAS fact sheet for a link to the DOT&PF project website. As requests

2355 HILL ROAD
FAIRBANKS, ALASKA 99709-5326
907-479-0600 • FAX 907-479-5691

are received we will update the website map. Feel free to contact us if you have questions regarding your results.

Sincerely,

SHANNON & WILSON, INC.

Kristen Freiburger
Associate

Enc: Select Pages of Eurofins TestAmerica Laboratory Report No. 320-88822-1
PFAS Fact Sheet - Iliamna Airport

2355 HILL ROAD
FAIRBANKS, ALASKA 99709-5326
907-479-0600 • FAX 907-479-5691

APPENDIX C: ANALYTICAL DATA AND LDRC

Appendix C

Analytical Data and LDRC

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-88822-1
Client Project/Site: Iliamna DOT PFAS

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Ashley Jaramillo

Authorized for release by:
6/16/2022 3:57:24 PM

David Alltucker, Project Manager I
(916)374-4383
David.Alltucker@et.eurofinsus.com

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Qualifiers

LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 320-88822-1

Laboratory: Eurofins Sacramento

Narrative

Job Narrative
320-88822-1

Receipt
The samples were received on 6/9/2022 11:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.8º C.

LCMS
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Client Sample ID: ILI-001 — Lab Sample ID: 320-88822-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	5.3		1.9	0.48	ng/L	1	537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.53		1.9	0.48	ng/L	1	537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.77		1.9	0.48	ng/L	1	537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	6.8		1.9	0.48	ng/L	1	537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	19		1.9	0.48	ng/L	1	537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	11		1.9	0.48	ng/L	1	537.1 DW	Total/NA

Client Sample ID: ILI-101 — Lab Sample ID: 320-88822-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	5.2		1.8	0.46	ng/L	1	537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.52		1.8	0.46	ng/L	1	537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	0.65		1.8	0.46	ng/L	1	537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	7.1		1.8	0.46	ng/L	1	537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	21		1.8	0.46	ng/L	1	537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	12		1.8	0.46	ng/L	1	537.1 DW	Total/NA

Client Sample ID: ILI-013 — Lab Sample ID: 320-88822-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.8		1.9	0.47	ng/L	1	537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.60		1.9	0.47	ng/L	1	537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	1.1		1.9	0.47	ng/L	1	537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	9.1		1.9	0.47	ng/L	1	537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	28		1.9	0.47	ng/L	1	537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	24		1.9	0.47	ng/L	1	537.1 DW	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Client Sample ID: ILI-001
Date Collected: 06/01/22 17:44
Date Received: 06/09/22 12:44

Lab Sample ID: 320-88822-1
Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**5.3**		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluoroheptanoic acid (PFHpA)	**0.53**	**J**	1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorooctanoic acid (PFOA)	**0.77**	**J**	1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorobutanesulfonic acid (PFBS)	**6.8**		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorohexanesulfonic acid (PFHxS)	**19**		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Perfluorooctanesulfonic acid (PFOS)	**11**		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.48	ng/L		06/13/22 05:47	06/14/22 23:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*99*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:02*	*1*
13C2 PFDA	*100*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:02*	*1*
d5-NEtFOSAA	*96*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:02*	*1*
13C3 HFPO-DA	*91*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:02*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Client Sample ID: ILI-101
Date Collected: 06/01/22 17:34
Date Received: 06/09/22 12:44

Lab Sample ID: 320-88822-2
Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**5.2**		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluoroheptanoic acid (PFHpA)	**0.52**	**J**	1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorooctanoic acid (PFOA)	**0.65**	**J**	1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorobutanesulfonic acid (PFBS)	**7.1**		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorohexanesulfonic acid (PFHxS)	**21**		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Perfluorooctanesulfonic acid (PFOS)	**12**		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.46	ng/L		06/13/22 05:47	06/14/22 23:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:10*	*1*
13C2 PFDA	*88*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:10*	*1*
d5-NEtFOSAA	*91*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:10*	*1*
13C3 HFPO-DA	*88*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:10*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Client Sample ID: ILI-013
Date Collected: 06/01/22 18:08
Date Received: 06/09/22 12:44

Lab Sample ID: 320-88822-3
Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**4.8**		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluoroheptanoic acid (PFHpA)	**0.60**	**J**	1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorooctanoic acid (PFOA)	**1.1**	**J**	1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorobutanesulfonic acid (PFBS)	**9.1**		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorohexanesulfonic acid (PFHxS)	**28**		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Perfluorooctanesulfonic acid (PFOS)	**24**		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.47	ng/L		06/13/22 05:47	06/14/22 23:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*98*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:18*	*1*
13C2 PFDA	*104*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:18*	*1*
d5-NEtFOSAA	*101*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:18*	*1*
13C3 HFPO-DA	*92*		*70 - 130*	*06/13/22 05:47*	*06/14/22 23:18*	*1*

Surrogate Summary

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		PFHxA	PFDA	d5NEFOS	HFPODA
Lab Sample ID	Client Sample ID	(70-130)	(70-130)	(70-130)	(70-130)
320-88822-1	ILI-001	99	100	96	91
320-88822-2	ILI-101	89	88	91	88
320-88822-3	ILI-013	98	104	101	92
LCS 320-594941/2-A	Lab Control Sample	94	100	86	91
LCSD 320-594941/21-A	Lab Control Sample Dup	93	98	78	95
MB 320-594941/1-A	Method Blank	89	90	82	82

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-594941/1-A
Matrix: Water
Analysis Batch: 595491

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 594941

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.50	ng/L		06/13/22 05:47	06/14/22 22:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*70 - 130*	*06/13/22 05:47*	*06/14/22 22:40*	
13C2 PFDA	*90*		*70 - 130*	*06/13/22 05:47*	*06/14/22 22:40*	
d5-NEtFOSAA	*82*		*70 - 130*	*06/13/22 05:47*	*06/14/22 22:40*	
13C3 HFPO-DA	*82*		*70 - 130*	*06/13/22 05:47*	*06/14/22 22:40*	

Lab Sample ID: LCS 320-594941/2-A
Matrix: Water
Analysis Batch: 595645

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 594941

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	160	153		ng/L		95	70 - 130
Perfluoroheptanoic acid (PFHpA)	160	156		ng/L		97	70 - 130
Perfluorooctanoic acid (PFOA)	160	159		ng/L		99	70 - 130
Perfluorononanoic acid (PFNA)	160	157		ng/L		98	70 - 130
Perfluorodecanoic acid (PFDA)	160	161		ng/L		100	70 - 130
Perfluoroundecanoic acid (PFUnA)	160	149		ng/L		93	70 - 130
Perfluorododecanoic acid (PFDoA)	160	159		ng/L		99	70 - 130
Perfluorotridecanoic acid (PFTriA)	160	156		ng/L		98	70 - 130
Perfluorotetradecanoic acid (PFTeA)	160	146		ng/L		91	70 - 130
Perfluorobutanesulfonic acid (PFBS)	141	156		ng/L		110	70 - 130

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCS 320-594941/2-A
Matrix: Water
Analysis Batch: 595645

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 594941

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Perfluorohexanesulfonic acid (PFHxS)			146	153		ng/L		105	70 - 130		
Perfluorooctanesulfonic acid (PFOS)			148	144		ng/L		97	70 - 130		
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			160	156		ng/L		98	70 - 130		
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			160	143		ng/L		89	70 - 130		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O			149	163		ng/L		109	70 - 130		
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF			151	148		ng/L		98	70 - 130		
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			160	150		ng/L		94	70 - 130		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			151	143		ng/L		95	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*94*		*70 - 130*
13C2 PFDA	*100*		*70 - 130*
d5-NEtFOSAA	*86*		*70 - 130*
13C3 HFPO-DA	*91*		*70 - 130*

Lab Sample ID: LCSD 320-594941/21-A
Matrix: Water
Analysis Batch: 595491

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 594941

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)			160	150		ng/L		94	70 - 130	2	30
Perfluoroheptanoic acid (PFHpA)			160	144		ng/L		90	70 - 130	8	30
Perfluorooctanoic acid (PFOA)			160	154		ng/L		96	70 - 130	3	30
Perfluorononanoic acid (PFNA)			160	152		ng/L		95	70 - 130	3	30
Perfluorodecanoic acid (PFDA)			160	160		ng/L		100	70 - 130	0	30
Perfluoroundecanoic acid (PFUnA)			160	142		ng/L		89	70 - 130	5	30
Perfluorododecanoic acid (PFDoA)			160	150		ng/L		94	70 - 130	5	30
Perfluorotridecanoic acid (PFTriA)			160	153		ng/L		95	70 - 130	2	30
Perfluorotetradecanoic acid (PFTeA)			160	145		ng/L		90	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)			141	160		ng/L		113	70 - 130	3	30
Perfluorohexanesulfonic acid (PFHxS)			146	160		ng/L		110	70 - 130	4	30
Perfluorooctanesulfonic acid (PFOS)			148	144		ng/L		97	70 - 130	0	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			160	151		ng/L		94	70 - 130	4	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			160	138		ng/L		86	70 - 130	3	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O			149	172		ng/L		115	70 - 130	6	30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCSD 320-594941/21-A
Matrix: Water
Analysis Batch: 595491

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 594941

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF			151	160		ng/L		106	70 - 130	8	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			160	153		ng/L		95	70 - 130	2	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			151	150		ng/L		99	70 - 130	5	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*93*		*70 - 130*
13C2 PFDA	*98*		*70 - 130*
d5-NEtFOSAA	*78*		*70 - 130*
13C3 HFPO-DA	*95*		*70 - 130*

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

LCMS

Prep Batch: 594941

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88822-1	ILI-001	Total/NA	Water	537.1 DW	
320-88822-2	ILI-101	Total/NA	Water	537.1 DW	
320-88822-3	ILI-013	Total/NA	Water	537.1 DW	
MB 320-594941/1-A	Method Blank	Total/NA	Water	537.1 DW	
LCS 320-594941/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	
LCSD 320-594941/21-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	

Analysis Batch: 595491

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88822-1	ILI-001	Total/NA	Water	537.1 DW	594941
320-88822-2	ILI-101	Total/NA	Water	537.1 DW	594941
320-88822-3	ILI-013	Total/NA	Water	537.1 DW	594941
MB 320-594941/1-A	Method Blank	Total/NA	Water	537.1 DW	594941
LCSD 320-594941/21-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	594941

Analysis Batch: 595645

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 320-594941/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	594941

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Client Sample ID: ILI-001
Date Collected: 06/01/22 17:44
Date Received: 06/09/22 12:44

Lab Sample ID: 320-88822-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			263.1 mL	1.0 mL	594941	06/13/22 05:47	HK	TAL SAC
Total/NA	Analysis	537.1 DW		1			595491	06/14/22 23:02	D1R	TAL SAC

Client Sample ID: ILI-101
Date Collected: 06/01/22 17:34
Date Received: 06/09/22 12:44

Lab Sample ID: 320-88822-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			273.4 mL	1.0 mL	594941	06/13/22 05:47	HK	TAL SAC
Total/NA	Analysis	537.1 DW		1			595491	06/14/22 23:10	D1R	TAL SAC

Client Sample ID: ILI-013
Date Collected: 06/01/22 18:08
Date Received: 06/09/22 12:44

Lab Sample ID: 320-88822-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			264 mL	1.0 mL	594941	06/13/22 05:47	HK	TAL SAC
Total/NA	Analysis	537.1 DW		1			595491	06/14/22 23:18	D1R	TAL SAC

Laboratory References:

TAL SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Laboratory: Eurofins Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
537.1 DW	537.1 DW	Water	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF
537.1 DW	537.1 DW	Water	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
537.1 DW	537.1 DW	Water	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O
537.1 DW	537.1 DW	Water	Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)
537.1 DW	537.1 DW	Water	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)
537.1 DW	537.1 DW	Water	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)
537.1 DW	537.1 DW	Water	Perfluorobutanesulfonic acid (PFBS)
537.1 DW	537.1 DW	Water	Perfluorodecanoic acid (PFDA)
537.1 DW	537.1 DW	Water	Perfluorododecanoic acid (PFDoA)
537.1 DW	537.1 DW	Water	Perfluoroheptanoic acid (PFHpA)
537.1 DW	537.1 DW	Water	Perfluorohexanesulfonic acid (PFHxS)
537.1 DW	537.1 DW	Water	Perfluorohexanoic acid (PFHxA)
537.1 DW	537.1 DW	Water	Perfluorononanoic acid (PFNA)
537.1 DW	537.1 DW	Water	Perfluorooctanesulfonic acid (PFOS)
537.1 DW	537.1 DW	Water	Perfluorooctanoic acid (PFOA)
537.1 DW	537.1 DW	Water	Perfluorotetradecanoic acid (PFTeA)
537.1 DW	537.1 DW	Water	Perfluorotridecanoic acid (PFTriA)
537.1 DW	537.1 DW	Water	Perfluoroundecanoic acid (PFUnA)

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Method	Method Description	Protocol	Laboratory
537.1 DW	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Iliamna DOT PFAS

Job ID: 320-88822-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-88822-1	ILI-001	Water	06/01/22 17:44	06/09/22 12:44
320-88822-2	ILI-101	Water	06/01/22 17:34	06/09/22 12:44
320-88822-3	ILI-013	Water	06/01/22 18:08	06/09/22 12:44

CHAIN-OF-CUSTODY RECORD

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Page 1 of 1

Laboratory Eurofins Test America
Attn: David Althacker

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No:

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS +Hexane (537.1)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
ILI-001		1744	6/1/22	X	2	Drinking Water
ILI-101		1734	↓	X	2	↓
ILI-013		1808	↓	X	2	↓

320-88822 Chain of Custody

Project Information	
Number:	105201-005
Name:	Iliamna DOT PFAS
Contact:	A. Jaramillo
Ongoing Project?	Yes [X] No [ ]
Sampler:	RLW

Sample Receipt	
Total No. of Containers:	6
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	

Notes:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1400	Signature: Time:	Signature: Time:
Printed Name: Rachel Willis Date: 6/8/22	Printed Name: Date:	Printed Name: Date:
Company: Shannon + Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 11:15	Signature: Time:	Signature: Time:
Printed Name: Juan Guzman Date: 6/9/22	Printed Name: Date:	Printed Name: Date:
Company: EETSAL	Company:	Company:

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

1, 8

No. 36392

6/16/2022

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-88822-1

Login Number: 88822
List Number: 1
Creator: Alltucker, David R

List Source: Eurofins Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	seals
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Data Review Checklist

Completed By:

Kristen Freiburger

Title:

Associate; Environmental Chemist

Date:

June 17, 2022

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins TestAmerica (TestAmerica)

Laboratory Report Number:

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

ADEC File Number:

2560.38.13 (informational)

Hazard Identification Number:

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

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

1. Laboratory

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

   Yes☐ No☒ N/A☐ Comments:

   The DEC certified Eurofins TestAmerica of West Sacramento, CA for the analysis of per- and polyfluoroalkyl substances (PFAS) on February 11, 2021 by LCMSMS compliant with QSM Version 5.3 Table B-15. These reported analytes were included in the DEC's Contaminated Sites Laboratory Approval 17-020. We note the laboratory used a similar method (EPA 537.1) to analyze these samples; the laboratory has not been approved for this method by DEC.

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

   Yes☐ No☐ N/A☒ Comments:

   Samples were not transferred or sub-contracted to a network or alternate laboratory.

2. Chain of Custody (CoC)

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

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☒ No☐ N/A☐ Comments:

3. Laboratory Sample Receipt Documentation

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

   Yes☒ No☐ N/A☐ Comments:

   The temperature of the cooler at sample receipt was 1.8º C.

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

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

Yes☒ No☐ N/A☐ Comments:

Samples were properly preserved with Trizma.

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

Yes☒ No☐ N/A☐ Comments:

The laboratory noted the samples arrived in good condition.

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

Yes☐ No☐ N/A☒ Comments:

No sample discrepancies were observed by the laboratory at sample login.

e. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

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

Yes☐ No☐ N/A☒ Comments:

The laboratory notes there were no analytical or quality issues to note.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions required.

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

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

Comments:

The laboratory does not note an effect on the data quality or usability in the case narrative. Please review the following sections for our assessment of the data.

5. Samples Results

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

Yes☒ No☐ N/A☐ Comments:

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

Soils were not requested as a part of this sample data group.

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

Yes☒ No☐ N/A☐ Comments:

Non-detect results were below the current EPA LHAs, where applicable.

e. Data quality or usability affected?

Data quality and usability were not affected.

6. QC Samples

a. Method Blank

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

Yes☒ No☐ N/A☐ Comments:

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

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

Yes☒ No☐ N/A☐ Comments:

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

Comments:

Not applicable, no analytes were detected in the method blank sample associated with this work order.

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

Yes☐ No☐ N/A☒ Comments:

See above.

v. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

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

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

Yes☒ No☐ N/A☐ Comments:

A LCS and LCSD were reported for PFAS analysis by EPA 537.1.

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

Yes☐ No☐ N/A☒ Comments:

Metals/Inorganics analyses were not requested as a part of this SDG.

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

Yes☒ No☐ N/A☐ Comments:

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

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

Yes☒ No☐ N/A☐ Comments:

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

Comments:

Not applicable, LCS/LCSD precision and accuracy results were within acceptable quality control criteria.

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

Yes☐ No☐ N/A☒ Comments:

No flagging required, see above.

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

Comments:

Data quality and usability were not affected.

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

Note: Leave blank if not required for project

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

Yes☐ No☒ N/A☐ Comments:

Batch precision and accuracy were evaluated using the LCS/LCSD.

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

Yes☐ No☐ N/A☒ Comments:

Metals/Inorganics analyses were not requested as a part of this SDG.

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

Yes☐ No☐ N/A☒ Comments:

See above.

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

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

Yes☐ No☐ N/A☒ Comments:

See above.

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

Comments:

N/A; see above.

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

Yes☐ No☐ N/A☒ Comments:

See above.

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

Comments:

Data quality and usability were not affected.

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

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

Yes☒ No☐ N/A☐ Comments:

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

Yes☒ No☐ N/A☐ Comments:

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

Yes☐ No☐ N/A☒ Comments:

No sample results had failed IDA recoveries, data flagging not required.

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

iv. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

e. Trip Blanks

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

Yes☐ No☐ N/A☒ Comments:

No trip blank sample included. PFAS is not a volatile analysis and does not required a trip blank sample.

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

Yes☐ No☐ N/A☒ Comments:

See above.

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

Yes☐ No☐ N/A☒ Comments:

See above.

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

Comments:

Not applicable, see above.

v. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

f. Field Duplicate

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

Yes☒ No☐ N/A☐ Comments:

Sample *ILI-101* is the field duplicate sample for *ILI-001.*

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

RPDs were below the DQO, where calculable.

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

Comments:

Data quality and usability were not affected.

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

Yes☐ No☐ N/A☒ Comments:

Samples were collected using single use equipment. Equipment blanks not required.

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

Yes☐ No☐ N/A☒ Comments:

See above.

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

Comments:

Not applicable, see above.

iii. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

320-88822-1

Laboratory Report Date:

June 16, 2022

CS Site Name:

ADOT&PF Iliamna Airport Sitewide PFAS

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

   a. Defined and appropriate?

      Yes☐ No☐ N/A☒ Comments:

APPENDIX D: QUALITY ASSURANCE AND QUALITY CONTROL

Appendix D

Quality Assurance and Quality Control Summary

CONTENTS

COC	chain-of-custody
°C	degrees Celsius
DQO	data quality objectives
GWP	General Work Plan
EPA	U.S. Environmental Protection Agency
Eurofins TestAmerica	Eurofins Environment Testing America
IDA	isotope dilution analyte
ILI	Iliamna Airport
LCS	laboratory control samples
LCSD	laboratory control sample duplicate
LDRC	Laboratory Data Review Checklist
QA	quality assurance
QC	quality control
RL	reporting limit
RPD	relative percent difference
S&W	Shannon & Wilson, Inc.
WO	work order

APPENDIX D: QUALITY ASSURANCE AND QUALITY CONTROL

D.1 INTRODUCTION

This quality assurance (QA)/quality control (QC) summary outlines the technical review of analytical results generated in support of water supply well sample collection at the Iliamna Airport (ILI) in June 2022.

S&W reviewed project and QC analytical data to assess whether the data met the designated quality objectives and were acceptable for project use. The project data were reviewed for deviations to the requirements presented in the DOT&PF Statewide PFAS General Work Plan (GWP). The review included evaluation of the following: sample collection and handling, holding times, blanks (to assess contamination), project sample and laboratory quality control sample duplicates (to assess precision), and laboratory control samples (LCSs) and sample surrogate recoveries (to assess accuracy). Calibration curves and continuing calibration verification recoveries are not reviewed unless a QC discrepancy was noted by the laboratory in a case narrative. QC deviations that do not impact data quality (e.g., high LCS recovery associated with non-detect results), are not discussed. Additional details of data quality descriptions are reported in the DEC Laboratory Data Review Checklists (LDRCs), which are included in Appendix C following the laboratory report.

Water supply well results and reporting limits (RLs) for non-detect results were compared to the U.S. Environmental Protection Agency (EPA) Lifetime Health Advisory of 70 nanograms per liter for the sum PFOS and PFOA.

D.1.1 Analytical Methods and Data Quality Objectives

The analytical methods and associated data quality objectives (DQOs) used for this review were established in the GWP and the Data-Validation Program Plan. The DQOs represent the minimum acceptable QC limits and goals for analytical measurements and are used as comparison criteria during data quality review to determine both the quality and usability of the analytical data.

The six DQOs used for this review were accuracy, precision, representativeness, comparability, sensitivity, and completeness.

- Accuracy measures the correctness, or the closeness, between the true value and the quantity detected. It is measured by calculating the percent recovery of known concentrations of spiked compounds that were introduced into the appropriate sample matrix. Surrogate and LCS recoveries were used to measure accuracy for this project.
- Precision measures the reproducibility of repetitive measurements. It is measured by calculating the relative percent difference (RPD) between duplicate samples. Laboratory

duplicate samples, field duplicate samples, and LCS and laboratory control sample duplicate (LCSD) pairs were used to measure precision for this project. LCS/LCSD precision criteria are defined in the laboratory report and field duplicate precision criteria are defined in the DEC LDRC (water: ≤30%).

- Representativeness describes the degree to which data accurately and precisely represents site characteristics. This is addressed in more detail in the following section(s).
- Comparability describes whether two data sets can be considered equivalent with respect to the project goal. This is addressed in more detail in the following section(s).
- Sensitivity describes the lowest concentration that the analytical method can reliably quantitate and is evaluated by verifying that the detected results and/or limits of detection meet the project-specific cleanup levels and/or screening levels.
- Completeness describes the amount of valid data obtained from the sampling event(s). It is calculated as the percentage of valid measurements compared to the total number of measurements. The completeness goal for this project was set at 90 percent.

In addition to these criteria for the six DQOs described above, sample collection and handling procedures and blank samples were reviewed to ensure overall data quality. Sample collection forms were reviewed to verify that representative samples were collected. Sample handling was reviewed to assess parameters such as chain-of-custody (COC) documentation, the use of appropriate sample containers and preservatives, shipment cooler temperature, and method-specified sample holding times. Each of these parameters contributes to the general representativeness and comparability of the project data. The combination of evaluations of the above-mentioned parameters will lead to a determination of the overall project data completeness.

D.1.2 Summary of Groundwater Samples

A total of three groundwater samples were collected by S&W from water supply wells at and near the ILI in June of 2022 (including a field duplicate).

Each project and quality control sample was analyzed by Eurofins Environment Testing America Laboratory of West Sacramento, California (Eurofins). Eurofins was certified for the analysis of PFAS on February 11, 2021 by compliance with LCMS-MS Quality Systems Manual (QSM) Version 5.3 Table B-15. The reported analytes were included in the DEC's Contaminated Sites Laboratory Approval 17-020. Prior to February 11, 2021, Eurofins TestAmerica was certified for the analysis of PFOS and PFOA only by Method 537. We note the laboratory used a similar method (EPA 537.1) to analyze these samples; the laboratory has not been approved for this method by DEC. We do not believe that this has any effect on data quality.

Groundwater samples were shipped via Alaska Airlines Goldstreak service from Fairbanks to the laboratory in West Sacramento, California. The laboratory report was assigned work order (WO) number 320-88822-1.

The laboratory report and associated DEC LDRC are included in Appendix C.

D.2 WATER SUPPLY WELL DATA QUALITY REVIEW

This section presents the findings of our data quality review and the resulting data qualifications for water supply well samples. See the associated LDRCs in Appendix C for more detailed data quality descriptions.

D.2.1 Sample Collection

Water supply well sample collection forms were reviewed to ensure that parameters met the stabilization guide identified in the GWP and DEC Field Sampling Guidance. Samples met stabilization criteria.

D.2.2 Sample Handling

Evaluation of proper sample handling procedures includes verification of the following: correct COC documentation, appropriate sample containers and preservatives, cooler temperatures maintained within the DEC-recommended temperature range (0 to 6 degrees Celsius [°C]), and sample analyses performed within method-specified holding times.

No sample handling discrepancies were noted upon receipt at the laboratory.

D.2.3 Method Blanks

Method blanks were utilized to detect potential laboratory cross-contamination of project samples. Samples are considered affected if they are detected within ten times the concentration of the detection in the method blank. Samples were analyzed in every batch, as required. No analytes were detected which resulted in the qualification of data. See the associated DEC LDRC checklist for a more detailed discussion.

D.2.4 Laboratory Control Samples

LCS/LCSD samples were prepared by adding spike compounds to blank, PFAS-free samples in order to assess laboratory extraction and instrumentation performance. An LCS/LCSD pair was reported in the WO.

The LCS/LCSD recoveries and/or RPDs were within laboratory and project limits and did not result in qualification of the data.

D.2.5 Isotope Dilution Analyte Recovery

Isotope dilution analyte (IDA) compounds were added to project samples by the laboratory prior to analysis, in accordance with method requirements. IDA recoveries were then calculated as percentages and reported by the laboratory as a measure of analytical extraction efficiency. IDA recoveries were inside the established control limits and resulted in no qualification of the data.

D.2.6 Field Duplicates

One field duplicate sample was collected and submitted to the laboratory as a blind sample. Field duplicate samples were collected at a minimum frequency of 10 percent. Field duplicates met the GWP guidelines of 30% for water samples and are considered comparable, where calculable.

D.2.7 Analytical Sensitivity

Analytical sensitivity was evaluated to verify that the RLs met the applicable regulatory levels for non-detect results. Analytes met the minimum required detection level for each compound for the WO.

D.2.8 Summary of Qualified Results

Overall, the review process deemed the water supply well project data acceptable for use. We did not reject any analytical results due to failures with laboratory QC samples, sample handling, or other issues. A summary of qualified flags can be found in the associated analytical summary tables, as applicable.

D.2.9 Completeness

No data were rejected pursuant to the data quality review, and the data may be used, as qualified, for the purposes of the June 2022 Water Supply Well Monitoring Summary Report.

IMPORTANT INFORMATION

Important Information

About Your Environmental Report

IMPORTANT INFORMATION

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

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

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

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

SUBSURFACE CONDITIONS CAN CHANGE.

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

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

IMPORTANT INFORMATION

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

IMPORTANT INFORMATION

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