



November 18, 2024

Jake Matter, Environmental Manager
Fairbanks International Airport
6450 Airport Way
Fairbanks, Alaska 99709

RE: FINAL 2024 FAIRBANKS INTERNATIONAL AIRPORT FIRE TRAINING PIT
INSTITUTIONAL CONTROL DOCUMENTATION, FAIRBANKS, ALASKA

Shannon & Wilson, Inc. (S&W) has prepared this letter report to document the Fairbanks International Airport (FAI) former Fire Training Pit (FTP) institutional control (IC) compliance between July 2023 and July 2024. The FAI is located in Fairbanks, Alaska. These services were conducted on behalf of the Alaska Department of Transportation & Public Facilities (DOT&PF), under Notice to Proceed P4-11-23 and in accordance with DOT&PF's Professional Services Agreement Number 25-19-1-013 *Per- and Polyfluoroalkyl Substance (PFAS) Related Environmental & Engineering Services*.

INTRODUCTION

The former FTP is located south-southwest of the FAI runway 2R-20L (Figure 1). The geographic coordinates of the former FTP are latitude 64.7992, longitude -147.8808. The FAI former FTP was constructed in 1992 and 1993 as a 205-foot diameter basin built on a primary 80-mil high density polyethylene liner, containing well-drained fill material, and surrounded by shallow soil berms. The FAI Aircraft Rescue and Firefighting (ARFF) program used PFAS-containing aqueous film forming foam (AFFF) at and adjacent to the former FTP from 1993 to 2017 for fire training and testing activities. The former FTP is an active, Alaska Department of Environmental Conservation (DEC) listed contaminated site due to PFAS and historic fuel contamination (File Number 100.38.070, Hazard ID 1071).

BACKGROUND

To address known PFAS and hydrocarbon contamination at and adjacent to the former FTP, S&W prepared our 2019 *FAI FTP Fire Training Pit Corrective Action Work Plan REV2* (Work Plan). The primary corrective action described in the Work Plan was to cap the former FTP. The purpose of this cap is to prevent direct human and environmental exposure to the FTP contents, and to limit water infiltration into the FTP that has historically required annual or

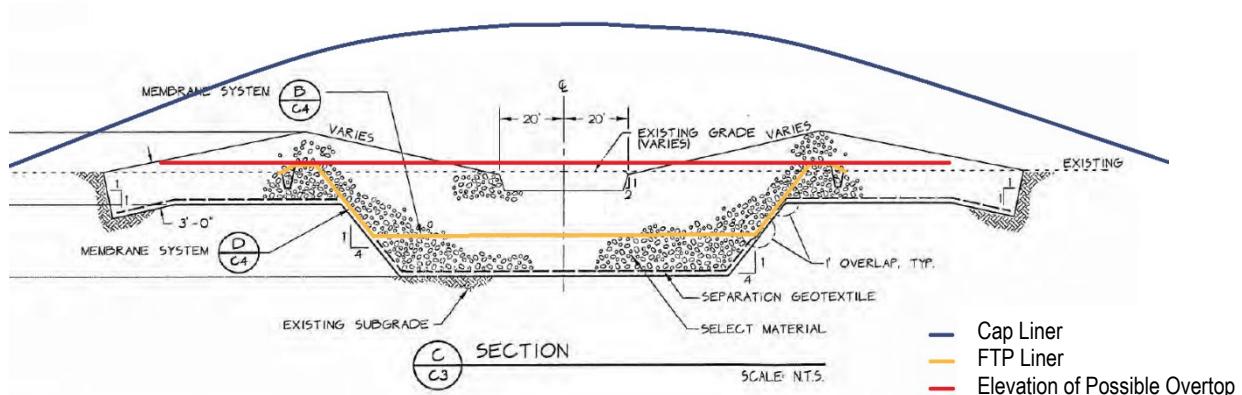
biennial pumping and offsite treatment. The secondary corrective action was the placement of ICs on the former FTP to address long-term monitoring and maintenance of the FTP cap.

Cap Construction

In 2019, S&W, their contractors, and FAI Maintenance & Operations (M&O) personnel designed and began construction of the cap to be placed over the FTP. Cap construction was completed in June 2020. The cap consists of a geotextile placed directly on top of the FTP contents, followed by gravel fill, a 40-mil fortified polyolefin alloy geomembrane, a layer of silty soil, topsoil, and hydroseed/vegetation. Exhibit 1, below, presents a generalized cross-section of the FTP, showing the installed cap liner (blue line) with respect to the original existing FTP liner (orange line).

Exhibit 1: FTP Schematic

Note: Schematic is exaggerated vertically, not to scale.



In the Fall of 2020, FAI M&O staff installed a bilge level switch 12 inches from the bottom of the former FTP sump located inside the original southwestern berm of the FTP. The sump monitoring device connects to a strobe warning light placed outside the sump. The warning light is visible to FAI Operations staff during daily rounds and is used to monitor former FTP water levels.

INSTITUTIONAL CONTROLS

DEC's Work Plan approval requested an additional submittal to describe long-term monitoring and maintenance of the FTP cap. S&W submitted the *Revised FTP Cap Institutional Controls (ICs) Addendum* (Addendum) to the Work Plan in July 2020. The Work

Plan along with the Addendum outlined the following ICs for the former FTP. ICs are discussed in the subsequent sections.

- Control access to the former FTP.
- Review and plot groundwater and surface level data.
- Establish flooding response measures.
- Perform FTP cap assessments.
- Monitor groundwater adjacent to the former FTP.
- Document monitoring well condition and perform maintenance as necessary.
- Document ICs for the reporting period (July 2023 through July 2024) in a summary report.

Control Access

The former FTP is located within a restricted area of the FAI. The FAI badging process prompts internal review and coordination which allows for dissemination of appropriate information, e.g. this area's restrictions. A fence separates the southwest portion of the FAI from the public roads that encircle the airport (Airport Perimeter and Airport Industrial Roads). The FTP area can be accessed by non-FAI personnel who have been briefed by FAI Operations staff, using a locked gate off Airport Perimeter Road.

The FAI has noted the former FTP on the internal FAI Information Map to inform FAI staff the area is closed, and to prohibit excavation, drilling, or other soil-disturbing activities within the cap boundaries. The Information Map is maintained by FAI Engineering in AutoCAD and is universally available in PDF format for reference by FAI staff.

The former FTP is no longer used for ARFF training or other activities. Airport Police and Fire have communicated at shift briefings that this location is out of service and no longer to be used for any airport purposes.

Although the cap was designed to accommodate infrequent traffic by vehicles and heavy equipment, the FAI anticipates access will be limited to snow plowing and brush clearing. The FTP cap boundary is demarcated with a semi-permanent, removable barrier to prevent unintentional vehicle traffic.

Although not specified in the Work Plan or Addendum, the IC of controlling access to the former FTP should be conducted for the lifetime of the cap, or until DEC determines the ICs

are no longer warranted. No access breaches or anomalies were identified during the reporting period.

Groundwater and Surface Water Elevation Data

S&W began monitoring groundwater and surface-water levels near the capped FTP during our 2019 corrective action effort. Field staff measured groundwater levels manually during the September and October 2019 monitoring-well sampling events. On October 15, 2019, field staff installed a pressure transducer in monitoring well MW-9701-12 to log groundwater levels approximately 30 feet west of the edge of the FTP cap (Figure 2).

In February 2021, the automated pressure transducer was transferred to monitoring well MW-1901-15. Groundwater elevation measurements continued to also be collected during monitoring well sampling events. Per the Addendum this IC was to occur for three years, which passed in 2023. The last groundwater and surface water elevation data was reported was for the July 2022 through June 2023 reporting period. No episodes of flooding conditions occurred during groundwater and surface water elevation monitoring. We considered this IC has been satisfied.

Flooding Response Measures

The FTP sump bilge monitoring system is inspected monthly by FAI M&O to ensure it is in proper working order and to allow for the correction of discrepancies between automated readings and physical observations. Should the FAI encounter over 12 inches of water in the FTP sump, FAI will coordinate with DEC to develop a plan for water removal and treatment.

If flooding conditions occur in the FTP vicinity, FAI personnel may use sandbags to divert flood water away from the FTP, pump surface water into temporary storage tanks or unflooded surface water bodies, and/or other flood control techniques, as appropriate. If the FTP sump warning light is activated, FAI M&O staff will inspect the monitoring system to confirm the depth of water in the FTP sump. If they conclude extreme flooding conditions have resulted in surface water or groundwater overtopping the FTP liner and entering the lined area, the FAI will consider pumping the water into temporary onsite storage tanks, collecting analytical water samples, transporting it offsite for treatment, or other mitigation measures.

Although not specified in the Work Plan or Addendum, monthly monitoring system inspections should occur for the lifetime of the cap, or until DEC determines the IC is no

longer warranted. No flooding conditions were observed during inspections conducted for the reporting period.

Cap Assessments

The FAI Environmental Manager or M&O personnel will visually inspect the sump and cap on a quarterly basis. The quarterly inspection is included in the FAI Environmental master calendar and a standing M&O Work Order is generated. The assessment checklist notes the presence or absence of water in the sump, and documents signs of erosion, slope stability, vegetation cover, animal burrows, and exposed geomembrane or woody vegetation, if present. Inspection checklists are to be submitted with the summary report.

Although not specified in the Work Plan or Addendum, quarterly cap assessments should occur for the lifetime of the cap or until DEC determines the IC is no longer warranted.

Due to a transition of the FAI Environmental Manager position, the inspection was only completed once during the reporting period. The FAI Environmental Manager conducted one cap inspection in June of 2024. The inspection checklist is attached.

Groundwater Monitoring

S&W sampled the monitoring wells upgradient (MW-1902-15) and downgradient (MW-1901-15) of the former FTP (Figure 2) quarterly for one calendar year. Sampling occurred in June and October 2020 and January and March 2021. Groundwater samples were submitted for analysis for diesel range organics (DRO), volatile organic compounds (VOCs), and per- and polyfluoroalkyl substances (PFAS) to monitor the integrity of the existing FTP liner. For the second calendar year, S&W sampled the monitoring wells upgradient and down gradient in October and January 2021 for PFAS, and in April 2022 for PFAS, VOCs, and DRO. The sampling frequency was subsequently reduced to annual for PFAS in 2023.

In July of 2023, FAI requested S&W to also include sampling of the Don Bennett Range monitoring wells DBR-MW01 and DBR-MW02 (Figure 3) during the monitoring events for the FTP monitoring wells. These wells were installed for monitoring a PFAS release at the Don Bennett Range.

For the reporting period S&W sampled the monitoring wells upgradient and down gradient of the FTP in July 2024 for PFAS. S&W also sampled monitoring wells DBR-MW01 and DBR-MW02 for PFAS. Concentrations of PFOS and PFOA did not exceed DEC groundwater

cleanup levels (CULs) in the monitoring wells sampled during this assessment period. An analytical results table is attached (Table 1).

Per the most recent Work Plan Addendum, moving forward the former FTP upgradient and downgradient wells will be sampled for PFAS biennially in even-numbered years (i.e., 2024, 2026, etc.). FAI has also requested to continue sampling of the Don Bennett Range wells DBR-MW01 and DBR-MW02 (Figure 3) during the monitoring events for the FTP monitoring wells.

Monitoring Well Condition and Maintenance

Monitoring well inspections are conducted on the two FTP monitoring wells nests (MW-1901 and MW-1902) and the Don Bennett Range wells (DBR-MW01 and DBR-MW02) during the monitoring well sampling event. Frost jacking was noted on MW-1902-15 during the July 2024 event and the casing was cut down by 0.33 ft. For MW-1902-80 it was noted that the concrete monument has frost jacked a few inches and the PVC casing is leaning against the metal casing, however the PVC casing is fully functional. For MW-1902-150, it was noted that the concrete monument has frost jacked several inches. As of July 2024, each monitoring well inspected fully functional and no major repairs are needed. Monitoring well maintenance should continue to occur during monitoring well sampling events.

Reporting

IC documentation for the active ICs will continue with summary reports accompanying the biennial monitoring events. This report serves as the documentation of ICs required for the reporting period.

RECOMMENDATIONS

Based on requests from FAI, field activity observations, and our Addendum and Work Plan we recommend the following:

- Continue controlling access to the former FTP for the lifetime of the cap, or until DEC determines the IC is no longer warranted.
- Continue to conduct monthly FTP monitoring system inspections for the lifetime of the cap, or until DEC determines the IC is no longer warranted.
- Continue to conduct quarterly cap assessments for the lifetime of the cap or until DEC determines the IC is no longer warranted.

- Sample the former FTP upgradient and downgradient wells and the Don Bennett Range wells biennially for PFAS in the summer of even-numbered years (i.e., 2024, 2026, etc.).

CLOSURE

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 is included, to assist you and others in understanding the use and limitations of this report.

We appreciate the opportunity to continue assisting with this project. If there are any questions, please do not hesitate to contact me at 907-251-7534.

Sincerely,

SHANNON & WILSON

Ashley Jaramillo
Project Manager/Senior Chemist

Enc. Table 1 - July 2024 DBR & FTP MW Sampling Analytical Results
Figure 1 – Vicinity Map
Figure 2 – FTP Monitoring Wells
Figure 3 - Don Bennett Range Monitoring Well Locations
June 2024 FAI Fire Training Pit Institutional Control Checklist
Important Information

Table 1 - July 2024 DBR & FTP MW Sampling Analytical Results

			Sample ID	DBR-MW01	DBR-MW02	MW-1901-15	MW-1901-40	MW-2001-40	MW-1901-80	MW-1901-150
			Collection Date	7/25/2024	7/25/2024	7/24/2024	7/24/2024	7/24/2024	7/24/2024	7/24/2024
			Sample Type	Project Sample	Project Sample	Project Sample	Field Duplicate Pair		Project Sample	Project Sample
Method	Analyte	DEC Regulatory Limit	Units	Result	Result	Result	Result	Result	Result	Result
EPA 537(Mod) (PFAS)	Perfluorooctanesulfonic acid (PFOS)	400	ng/L	75	31	40	190	180	0.71 J	< 1.6
	Perfluorooctanoic acid (PFOA)	400	ng/L	21	8.6	31	75	80	< 1.8	< 1.6
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	N/A	ng/L	< 3.4	< 3.4	< 3.5	< 3.4	< 3.4	< 3.5	< 3.3
	Perfluorobutanesulfonic acid (PFBS)	N/A	ng/L	170	21	130	520	560	0.25 J	< 1.6
	Perfluorodecanoic acid (PFDA)	N/A	ng/L	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.8	< 1.6
	Perfluorododecanoic acid (PFDoA)	N/A	ng/L	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.8	< 1.6
	Perfluoroheptanoic acid (PFHpA)	N/A	ng/L	12	2.5	18	71	70	< 1.8	< 1.6
	Perfluorohexanesulfonic acid (PFHxS)	N/A	ng/L	470	100	490	1200	1300	1.2 J	0.94 J
	Perfluorohexanoic acid (PFHxA)	N/A	ng/L	140	35	180	690	700	< 1.8	< 1.6
	Perfluorononanoic acid (PFNA)	N/A	ng/L	1.0 J	1.6 J	7.4	3.9	3.9 J*	< 1.8	< 1.6
	Perfluorotetradecanoic acid (PFTeA)	N/A	ng/L	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.8	< 1.6
	Perfluorotridecanoic acid (PFTrDA)	N/A	ng/L	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.8	< 1.6
	Perfluoroundecanoic acid (PFUnA)	N/A	ng/L	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.8	< 1.6
	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	N/A	ng/L	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.8	< 1.6
	11-Chloroeicosfluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	N/A	ng/L	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.8	< 1.6
	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	N/A	ng/L	< 1.7	< 1.7	< 1.8	< 1.7	< 1.7	< 1.8	< 1.6
	N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	N/A	ng/L	< 4.3	< 4.2	< 4.4	< 4.2	< 4.2	< 4.4	< 4.1
	N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	N/A	ng/L	< 4.3	< 4.2	< 4.4	< 4.2	< 4.2	< 4.4	< 4.1

Notes: Results reported from Eurofins Environment Testing work order 320-114204-1.

Regulatory limits from 18 AAC 75.345 Table C - Groundwater Cleanup Levels.

DEC Alaska Department of Environmental Conservation

PFAS per- and poly-fluoroalkyl substances

DBR Don Bennett Range

FTP Fire Training Pit

RL reporting limit

DL detection limit

ng/L nanograms per liter

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

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

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

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

Table 1 - July 2024 DBR & FTP MW Sampling Analytical Results

			Sample ID	MW-1902-15	MW-1902-40	MW-1902-80	MW-1902-150	DBR-MW01-EB	MW-1901-150 FB
			Collection Date	7/25/2024	7/25/2024	7/25/2024	7/25/2024	7/25/2024	7/24/2024
			Sample Type	Project Sample	Project Sample	Project Sample	Project Sample	Equipment Blank	Field Blank
Method	Analyte	DEC Regulatory Limit	Units	Result	Result	Result	Result	Result	Result
EPA 537(Mod) (PFAS)	Perfluorooctanesulfonic acid (PFOS)	400	ng/L	9.0	1.6	0.53 J	0.53 J	< 1.7	< 1.7
	Perfluorooctanoic acid (PFOA)	400	ng/L	2.9	< 1.6	< 1.7	< 1.6	< 1.7	< 1.7
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	N/A	ng/L	< 3.4	< 3.3	< 3.3	< 3.3	< 3.4	< 3.4
	Perfluorobutanesulfonic acid (PFBS)	N/A	ng/L	3.2	0.34 J	< 1.7	< 1.6	< 1.7	< 1.7
	Perfluorodecanoic acid (PFDA)	N/A	ng/L	< 1.7	< 1.6	< 1.7	< 1.6	< 1.7	< 1.7
	Perfluorododecanoic acid (PFDoA)	N/A	ng/L	< 1.7	< 1.6	< 1.7	< 1.6	< 1.7	< 1.7
	Perfluoroheptanoic acid (PFHpA)	N/A	ng/L	1.0 J	< 1.6	< 1.7	< 1.6	< 1.7	< 1.7
	Perfluorohexanesulfonic acid (PFHxS)	N/A	ng/L	24	1.6	0.85 J	0.90 J	< 1.7	< 1.7
	Perfluorohexanoic acid (PFHxA)	N/A	ng/L	5.9	< 1.6	< 1.7	< 1.6	< 1.7	< 1.7
	Perfluorononanoic acid (PFNA)	N/A	ng/L	1.0 J	< 1.6	< 1.7	< 1.6	< 1.7	< 1.7
	Perfluorotetradecanoic acid (PFTeA)	N/A	ng/L	< 1.7	< 1.6	< 1.7	< 1.6	< 1.7	< 1.7
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	4,8-Dioxa-3H-perfluorononanoic acid (DONA)	N/A	ng/L	< 1.7	< 1.6	< 1.7	< 1.6	< 1.7	< 1.7
	N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	N/A	ng/L	< 4.2	< 4.1	< 4.2	< 4.1	< 4.2	< 4.3
	N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	N/A	ng/L	< 4.2	< 4.1	< 4.2	< 4.1	< 4.2	< 4.3

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DEC Alaska Department of Environmental Conservation

PFAS per- and poly-fluoroalkyl substances

DBR Don Bennett Range

FTP Fire Training Pit

RL reporting limit

DL detection limit

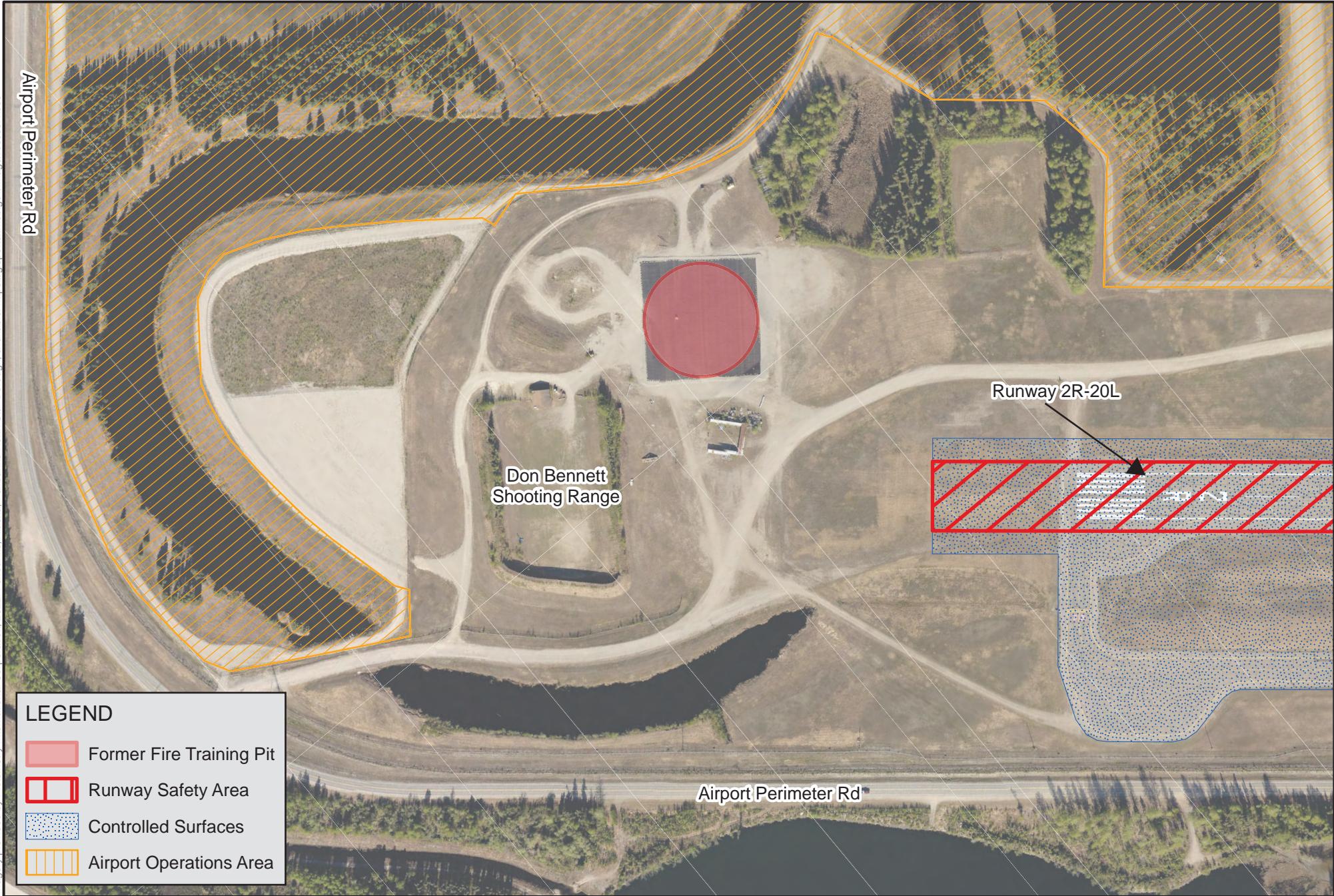
ng/L nanograms per liter

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

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

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

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

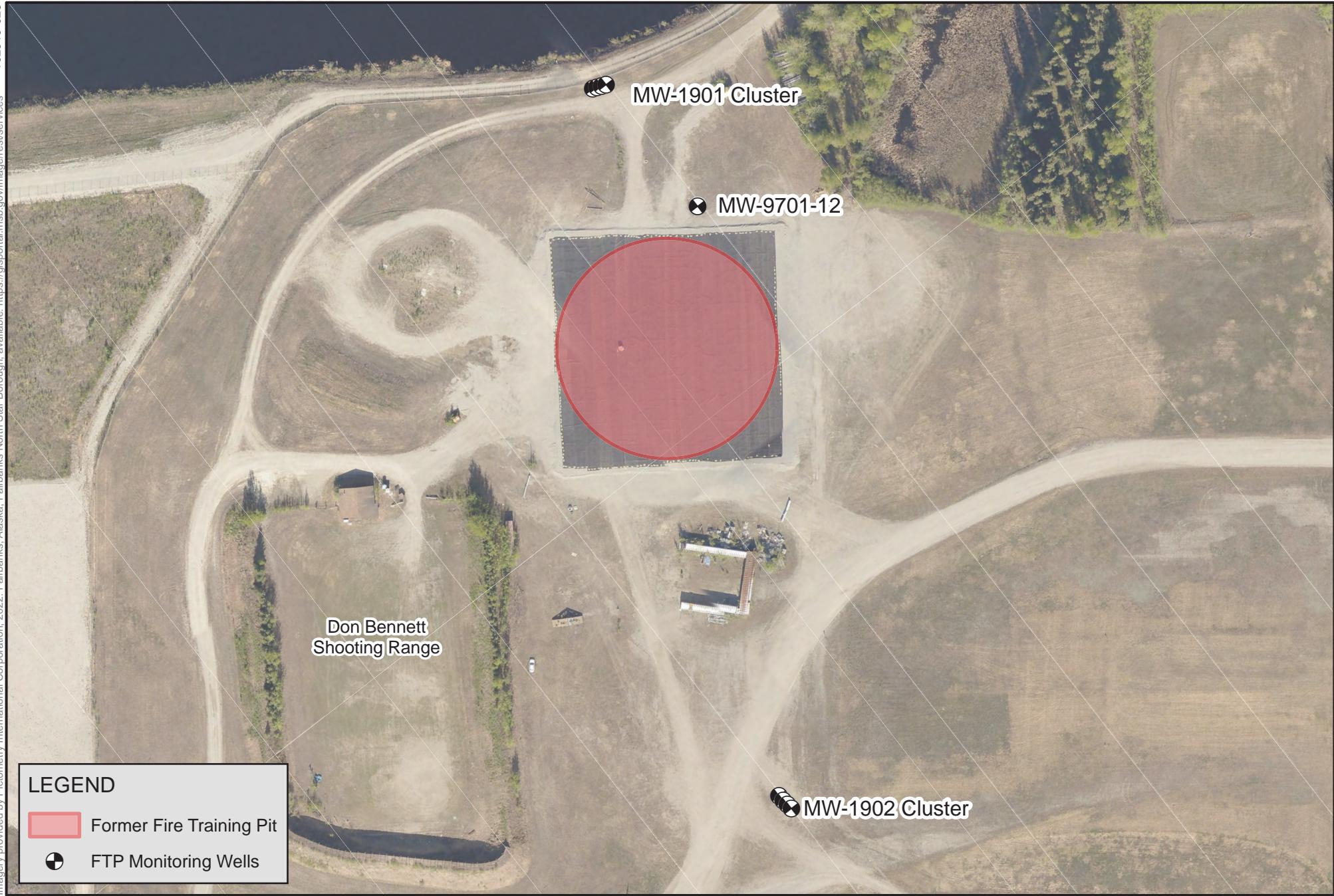


0 100 200 400
Feet

November 2024

VICINITY MAP

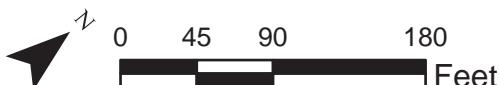
Figure 1

**Notes:**

1. Monitoring well clusters MW-1901 and MW-1902 have well depths from 15 feet to 150 feet bgs.
bgs = below ground surface

November 2024

FTP MONITORING WELLS**Figure 2**

**Notes:**

1. Monitoring well locations are approximate.
2. Information from Brice Environmental 2022 Sample Locations and Results, Figure 4-1; January 2023

November 2024
**DON BENNETT RANGE MONITORING
WELL LOCATIONS**
Figure 3



FAI Fire Training Pit

Institutional Controls Checklist

Date: 6/17/24

Name: Jake Matter

Sump:

- ✓ 1. Presence or absence of water in the sump: Present
- ✓ 2. How much water?
 - a. 28 inches from bottom of sump.
 - b. Did you measure from: Top of sump
- ✓ 3. Where was the float sensor or bilge level switch at the time of inspection? Sensor mounted to bar at top of sump hole
- ✓ 4. What was the condition of the sensor and alarm? Seemed to be in good condition, could not access sump for closer observation

Document Signs of:

- ✓ 1. Is there any visible signs of erosion: Yes- Small rill on south west side
- ✓ 2. Slope Stability:
 - ✓ a. Are there visible cracks? Circle one: No
 - ✓ b. Did there appear to be moisture changes? Circle one: No
 - ✓ c. Is there leaning or turned vegetation? Circle one: No
- ✓ 3. Is there vegetation cover? Circle one: Yes- mixture of bushes and grasses, Spotty areas on top of dead grass,
- ✓ 4. Are there any visible animal burrows? Circle one: Yes 1 small burrow at North side
- ✓ 5. Does the geomembrane appear to be exposed? Circle one: No
- ✓ 6. Is there exposed woody vegetation? Circle one: No
- ✓ 7. Are there any other irregularities? Yes- previously mentioned tire tracks are still visible but don't seem to have changed since 21 & 22 inspections

FAI Fire Training Pit

Institutional Controls Checklist

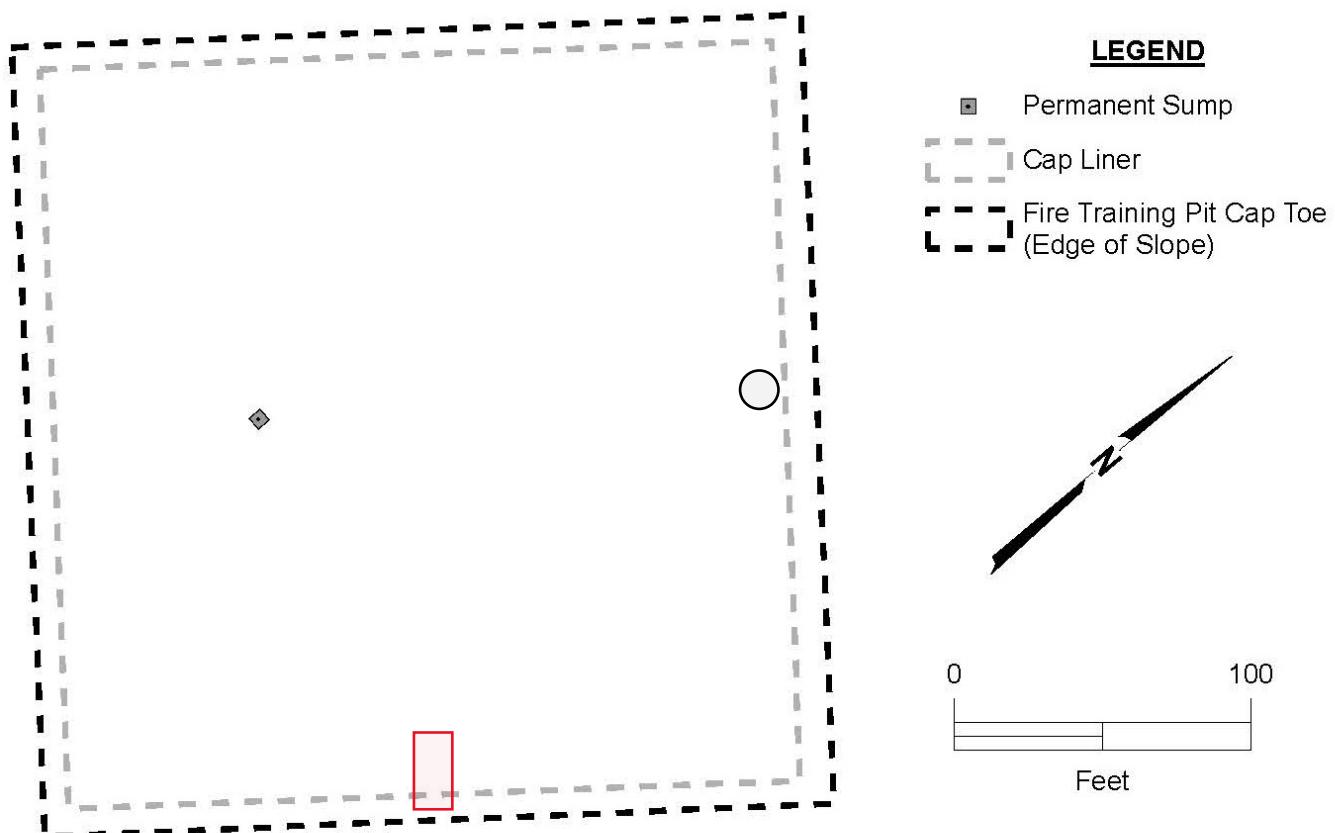
- ✓ 8. If you answered "yes" attach photos of your observations.
- ✓ 9. Attach two photos of the cap from different angles.

If answered "yes" to any of the above, indicate locations and provide additional detail on reverse.

Date:

6/17/2024

Cap Sketch: Circle indicates Burrow, Red square indicates rills



FAI Fire Training Pit

Institutional Controls Checklist



Rills On Western side

FAI Fire Training Pit

Institutional Controls Checklist



Old tire tracks noted from 21/22 insectcions

FAI Fire Training Pit

Institutional Controls Checklist



Small Animal Burrow at top of sloped edge on northern side

FAI Fire Training Pit

Institutional Controls Checklist



FTP cap viewed from base of hill at south side



View of Cap from southeast approach road

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

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

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

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

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

SUBSURFACE CONDITIONS CAN CHANGE.

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

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

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

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

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

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

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

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

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

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

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

READ RESPONSIBILITY CLAUSES CLOSELY.

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

**The preceding paragraphs are based on information provided by the Geoprofessional Business Association
(<https://www.geoprofessional.org>)**