

January 15, 2021

Sammy Cummings and Angie Spear  
Fairbanks International Airport  
6450 Airport Way, Suite 1  
Fairbanks, Alaska 99709

RE: BLOCK 4 LOT 2 SOIL SAMPLING DATA REPORT, FAIRBANKS INTERNATIONAL AIRPORT, FAIRBANKS, ALASKA

Shannon & Wilson, Inc. has prepared this letter report to document soil sample collection at the future [REDACTED] hangar site at lease lot Block 4, Lot 2 of the Fairbanks International Airport (FAI) in Fairbanks, Alaska. This final report supersedes the draft submitted on August 21, 2020. Figure 1 shows the location of the [REDACTED] hangar site on FAI property. The effort summarized herein was conducted by Shannon & Wilson on behalf of the FAI under Alaska Department of Transportation and Public Facilities (DOT&PF) Professional Services Agreement Number 25-19-1-013. This sampling effort was authorized by Notice to Proceed 4-13, issued on July 23, 2020.

The FAI is listed by the Alaska Department of Environmental Conservation (DEC) as an active contaminated site due to the presence of per- and polyfluoroalkyl substances (PFAS) in groundwater and surface water (File Number 100.38.277, Hazard ID 26816).

## BACKGROUND

[REDACTED] plans to build the hangar during the 2020 and 2021 construction seasons. Design drawings dated July 2, 2020 are enclosed. According to the drawings, [REDACTED] plans to excavate an approximately 200 feet by 150 foot area with a depth of at least one foot for the hangar pad. Utilities will include buried water, sanitary sewer, electrical, and natural gas. The four utilities will run approximately 300 from the hangar to the property boundary. The planned excavation area is displayed in Figures 2 and 3. The depth at which the utilities will be installed and number of trenches required for utility installation are not specified. The hangar groundbreaking was held on July 16, 2020.

The FAI is not aware of a past release of aqueous film-forming foam or other PFAS-containing substances at or adjacent to the [REDACTED] hangar site. However, the FAI requested that soil samples be collected prior to excavation to test for the presence of PFAS.

The purpose of this sampling effort was to evaluate PFOS and PFOA concentrations with respect to soil handling and disposal requirements.

## SCOPE OF SERVICES

Our scope of services for this project included:

- reviewing construction design drawings (enclosed);
- preparing a Site Safety and Health Plan for work at the site;
- collecting up to 15 surface and subsurface soil samples prior to or during construction of the [REDACTED] hangar;
- submitting analytical samples to Eurofins TestAmerica Sacramento (TestAmerica) laboratory for analysis of 18 PFAS by EPA Method 537.1M;
- reviewing the analytical data; and
- preparing this letter report.

## CONTAMINANTS OF CONCERN AND ACTION LEVELS

The primary contaminants of concern at the site are perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), two PFAS commonly found at airports and fire training areas. Shannon & Wilson compared soil sample results to the DEC soil-cleanup levels found in 18 Alaska Administrative Code 75 *Table B1. Method Two – Soil Cleanup Levels (Migration to Groundwater)*. Applicable soil-cleanup levels are 3.0 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) PFOS and 1.7  $\mu\text{g}/\text{kg}$  PFOA. There are no cleanup levels for other PFAS compounds.

## FIELD ACTIVITIES

On July 23, 2020, Shannon & Wilson personnel Ashley Jaramillo, Chemist, and Adam Wyborny, Environmental Engineer-in-Training, collected seven soil samples from within the hangar and utility footprint using hand tools. The surface-soil samples were collected from immediately beneath the vegetation, where present. Field staff noted several inches of sandy gravel beneath the vegetation, underlain by sandy silt.

On July 24, Ashley Jaramillo and Craig Beebe, Geologist, collected three subsurface samples and one field duplicate sample from within the utility footprint. They advanced shallow soil borings to approximately 4.5 feet below the ground surface using a gas-powered auger and hand auger. These individuals are State of Alaska Qualified Samplers per 18 AAC 75.333[b]

and 18 AAC 78.088[b]. Soil-sample locations are displayed in Figures 2 and 3. A copy of Shannon & Wilson's field notes are appended.

## Sample Custody, Storage, and Transport

Immediately after collection, Shannon & Wilson placed the soil-sample jars in Ziploc bags and stored them in a designated sample cooler maintained between 0°C and 6°C with ice substitute. Shannon & Wilson is aware of the potential for cross-contamination of PFAS samples from numerous everyday household items and took appropriate precautions to prevent cross-contamination.

Shannon & Wilson shipped the sample cooler to TestAmerica in West Sacramento, California on Monday, July 27, 2020, using Alaska Air Cargo priority overnight service. This allowed sufficient time for the laboratory to analyze the samples within holding-time requirements for the analytical method. The samples were submitted for determination of the 18 PFAS listed in EPA Method 537.1, a drinking water method, by 537M.

## ANALYTICAL RESULTS

PFOS was detected above the laboratory limit of quantitation (LOQ) in two surface-soil samples: at 1.2 µg/kg in sample 20FAI-LM-02, and 1.0 µg/kg in sample 20FAI-LM-03. PFOA was not detected above the LOQ. PFOS and/or PFOA were detected at estimated concentrations below the LOQ in samples 20FAI-LM-01, 20FAI-LM-04, 20FAI-LM-05, and 20FAI-LM-06. PFOS and PFOA were not detected in the subsurface samples collected from approximately 4 to 4.5 feet below the surface. In addition, perfluorohexanesulfonic acid (PFHxS) was detected in sample 20FAI-LM-05; there is no established DEC cleanup level for this compound. Analytical results are summarized in Table 1 and Figures 2 and 3.

## QUALITY ASSURANCE / QUALITY CONTROL

Quality Assurance/Quality Control (QA/QC) procedures assist in producing data of acceptable quality and reliability. Shannon & Wilson reviewed the analytical results for laboratory QC samples and conducted a QA assessment for this project. The QA assessment included a review of the chain-of-custody records and laboratory-receipt forms to check that custody was not breached, sample holding-times were met, and the samples were properly handled from the point of collection through analysis by the laboratory. The QA review procedures allowed Shannon & Wilson to document the accuracy and precision of the analytical data, as well as check the analyses were sufficiently sensitive to detect analytes at levels below regulatory standards.

The laboratory's detection limit (DL) is the lowest analyte concentration that can be measured. The laboratory's LOQ or reporting limit is the lowest analyte concentration that can be routinely measured in the sampled matrix within a specified limit of precision and bias, or the point at which a concentration is considered quantitative. Sample matrix, instrument performance, sample dilutions, and other factors may affect the DL and LOQ. If the analyte is detected between the DL and the LOQ, its concentration is considered an estimate. These values are flagged with a 'J' in the analytical results table; this flag is applied by the laboratory.

Shannon & Wilson reviewed the data using the current DEC Laboratory Data Review Checklist (LDRC) and applied a standardized set of flags. During the QC review, Shannon & Wilson applied flags indicating estimated data or analytical bias due to QC failures as follows.

- The PFOS result for sample 20FAI-LM-01 is considered estimated, biased high, and flagged 'JH' due to high recovery of the analyte in the matrix spike (MS) sample.
- The PFHxS result for sample 20FAI-LM-05 is considered estimated and flagged 'J' because the transition mass ratio did not meet laboratory acceptance criteria. This issue is typically observed due to matrix interference. The laboratory analyst used professional judgement to identify the analyte but there is some degree of uncertainty in this determination.

We consider the results to be acceptable and representative for assessing site conditions at the times and locations they were collected, with the applied qualifiers. No samples were rejected as unusable due to QC failures. Details regarding results of our QA analyses are presented in the appended TestAmerica laboratory report 320-63125-1 and associated LDRC.

## DISCUSSION AND CLOSURE

PFOS and PFOA were not detected above their respective DEC migration-to-groundwater cleanup levels in soil samples from the [REDACTED] hangar site. There are therefore no PFAS-related disposal or handling requirements related to soil excavated during construction. This conclusion should be re-evaluated if regulatory limits change prior to completion of the hangar, observations during construction suggest the presence of PFAS, or other information becomes available regarding the potential for PFAS to be present.

Shannon & Wilson has prepared the enclosed document "Important Information about Your Geotechnical/Environmental Report" to assist you and others in understanding the use and

limitations of this report. This data report was prepared for the exclusive use of the FAI and their representatives in accordance with our scope of services. Regulatory agencies may reach different conclusions than Shannon & Wilson.

Shannon & Wilson's observations represent site conditions as they existed during our July 2020 sampling effort. Our observations are specific to the locations and dates noted herein and may not be applicable to all areas of the site. This analytical testing effort cannot precisely predict the characteristics, quality, or distribution of PFAS throughout the site. Potential variations include, but are not limited to:

- The conditions between sampling points may be different.
- The passage of time or intervening causes (natural and manmade) may result in changes to site conditions.
- Contaminant concentrations may change seasonally or in response to other natural conditions, chemical reactions, and/or other events.
- The presence, distribution, and concentration of contaminants may vary from our sampling locations. Our tests may not represent the highest contaminant concentrations at the site.

The report should not be used without our approval 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.
- If the site ownership or land use has changed.
- If the land use or site ownership has changed.
- Regulations, laws, or cleanup levels change.
- If the site's regulatory status has changed.

If any of these occur, we should be retained to review the applicability of our analyses, conclusions, and recommendations.

We appreciate this opportunity to be of service to you.

Sincerely,

SHANNON & WILSON

Marcy Nadel  
Geologist

DHF:MDN:CBD/mdn

Enc. Figure 1 – ██████████ Hangar Site Vicinity  
Figure 2 – Surface Soil Sample Results  
Figure 3 – Subsurface Soil Sample Results  
PDC Engineers ██████████ Alaska Hangar Design Drawings  
Table 1 – Summary of Soil Sample Analytical Results  
Field Notes  
TestAmerica Analytical Laboratory Report 320-63125-1 and Laboratory Data Review  
Checklist  
Important Information about Your Geotechnical/Environmental Report

Cc: Theresa Harvey, FAI Operations Manager  
Katrina LeMieux, FAI Environmental Manager

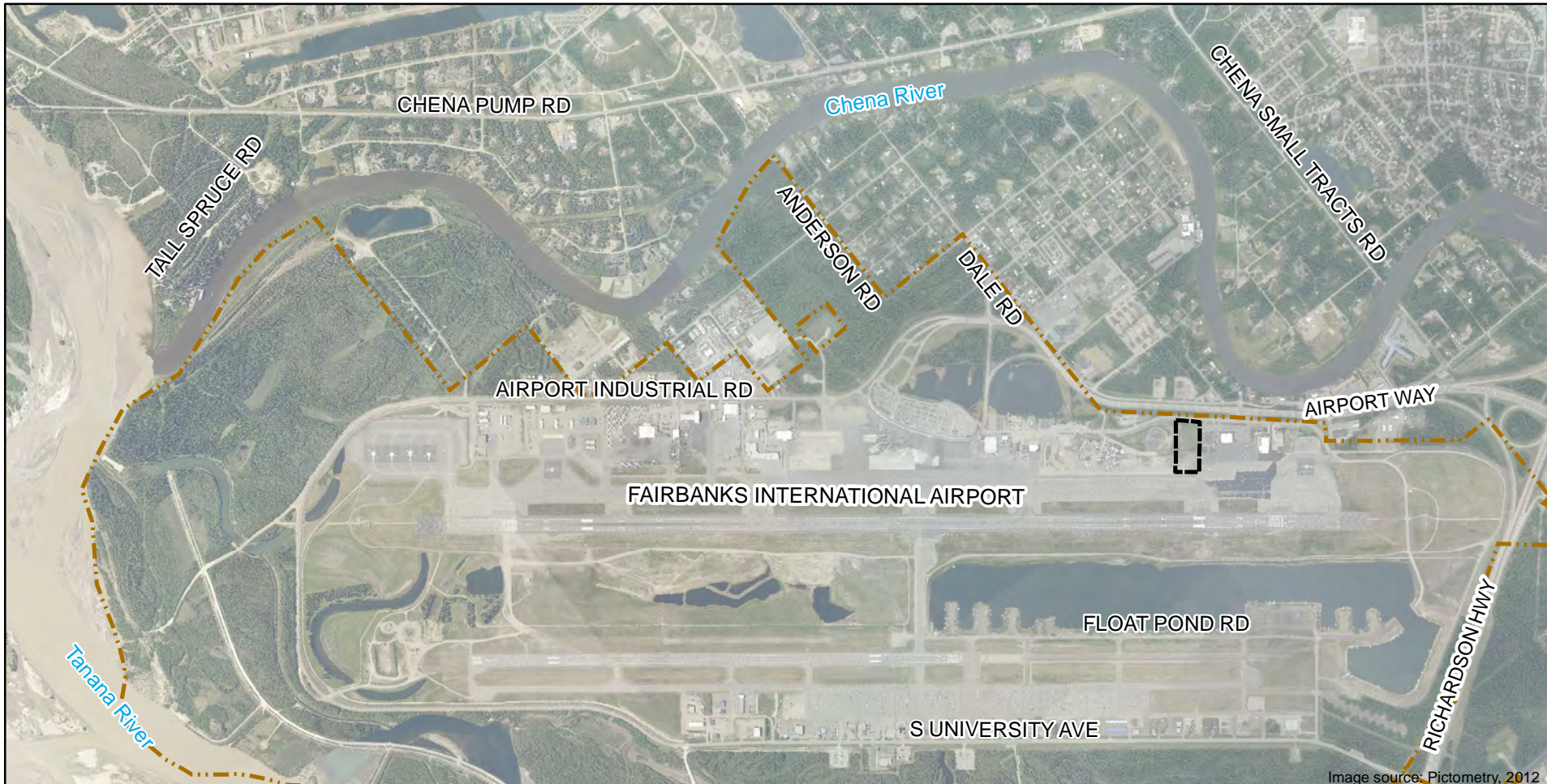


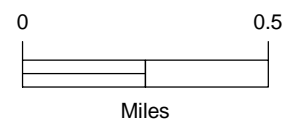
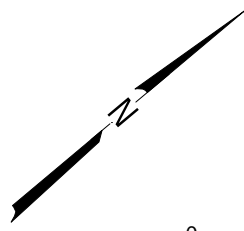


Image source: Pictometry, 2012

**LEGEND**

-  Lot 4 Block 2
-  FAI Boundary



Fairbanks International Airport  
Fairbanks, Alaska

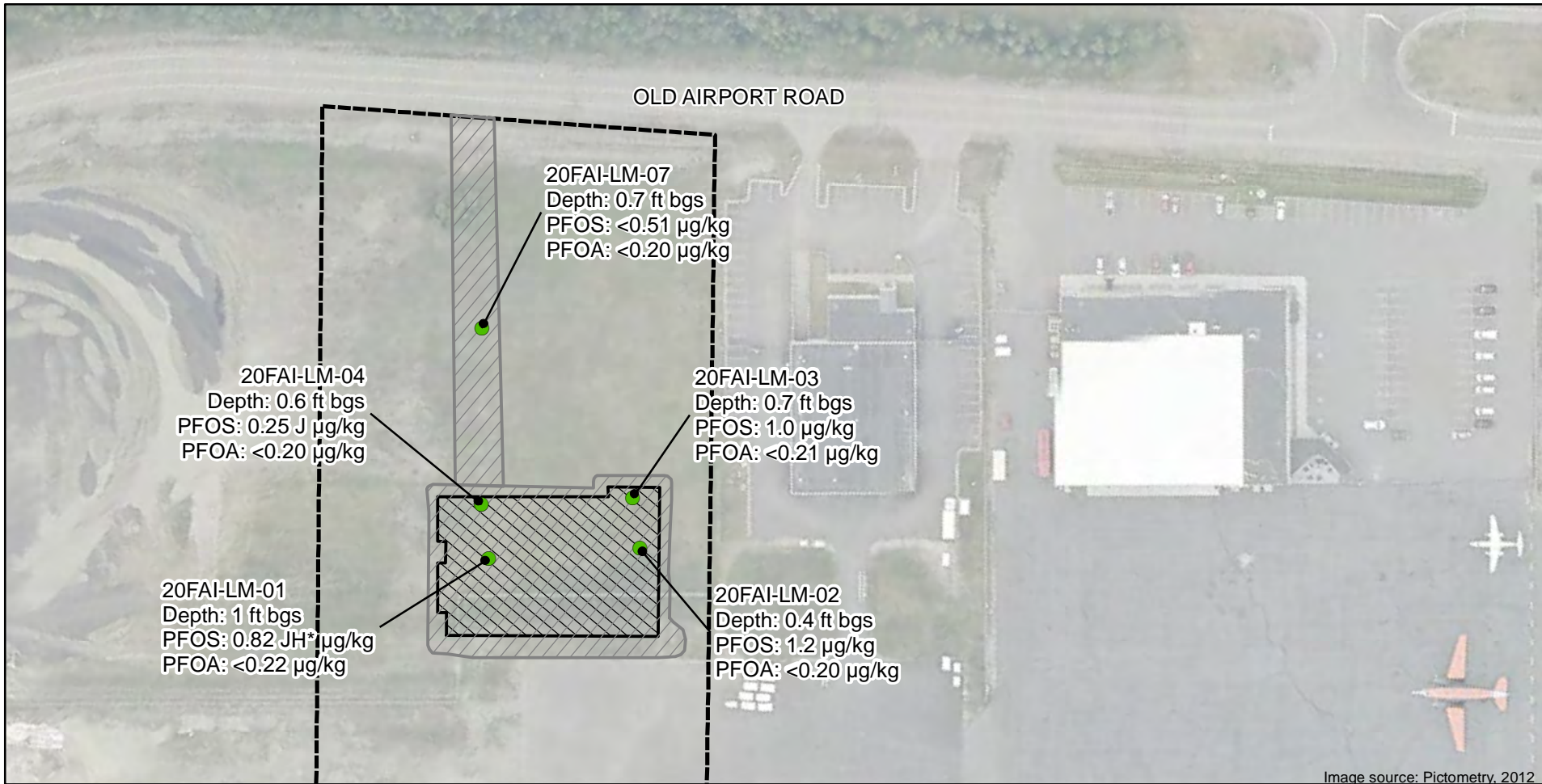
 **HANGAR  
SITE VICINITY**

January 2021





102519-014

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

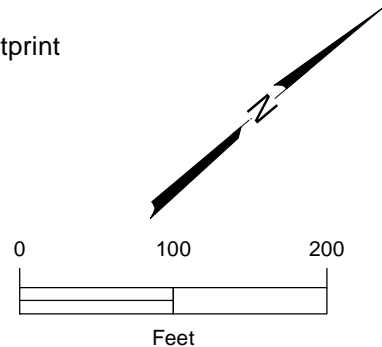
**Figure 1**



**LEGEND**

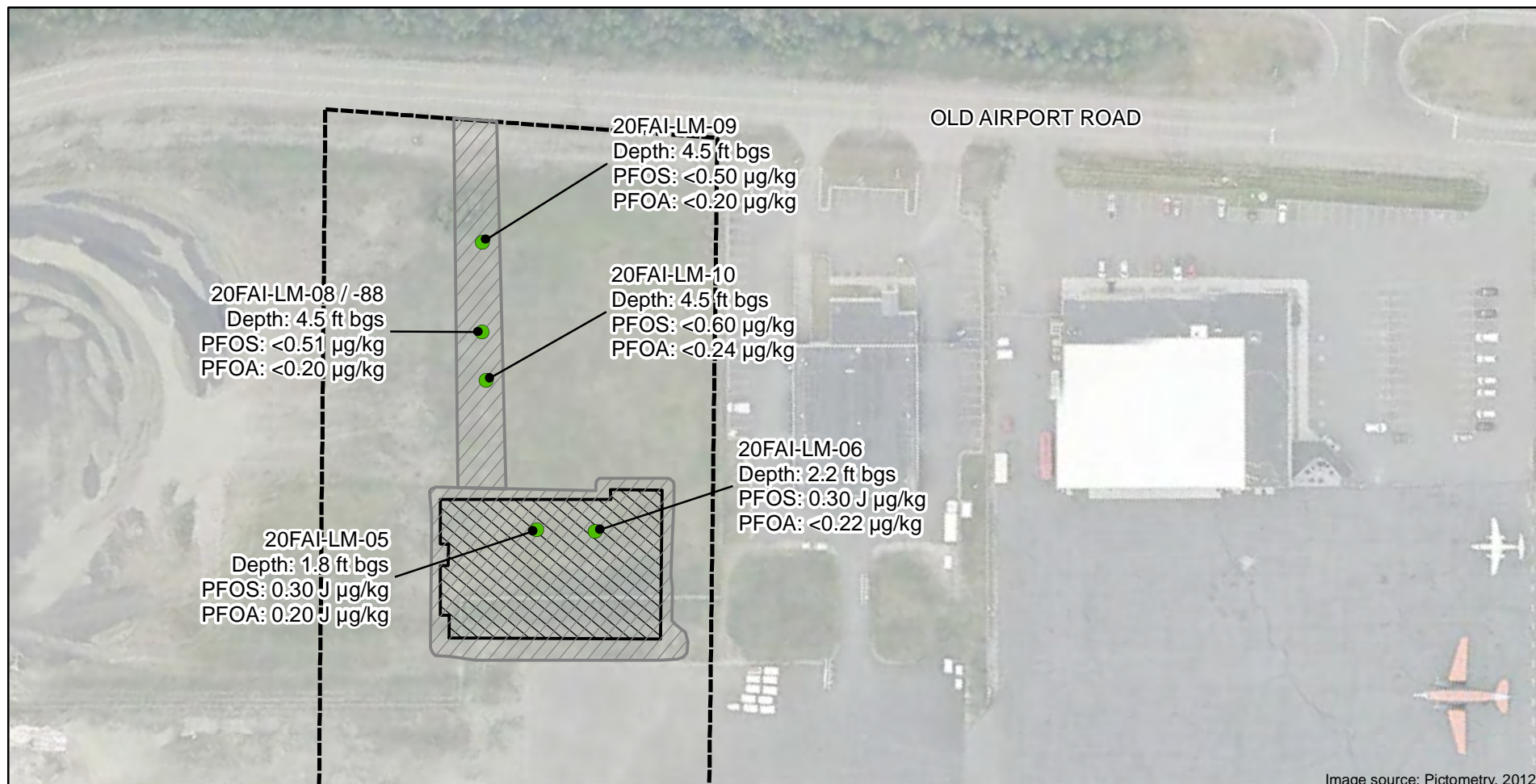
-  Surface soil sample, results below DEC cleanup levels
-  Excavation limits
-  Future hangar footprint
-  Block 4 Lot 2

NOTES:  
 J Estimated concentration, detected greater than the detection limit and less than the limit of quantitation. Flag applied by the laboratory.  
 < Analyte not detected; listed as less than the reporting limit unless otherwise flagged due to quality-control failures.  
 JH\* Estimated concentration, biased high, due to quality control failures. Flag applied by Shannon & Wilson, Inc.  
 bgs below ground surface



|  |            |
|--|------------|
| Fairbanks International Airport<br>Fairbanks, Alaska   |            |
| <b>SURFACE SOIL<br/>SAMPLE RESULTS</b>   |            |
| January 2021   | 102519-014 |
|  <b>SHANNON &amp; WILSON, INC.</b><br><small>GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS</small> |            |
| <b>Figure 2</b>  |            |



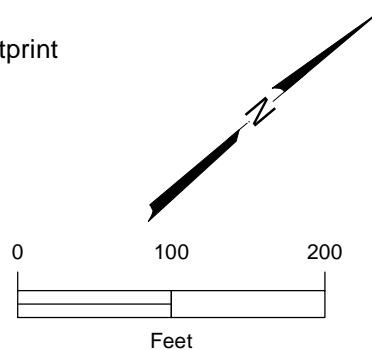


**LEGEND**

- Subsurface soil sample, results below DEC cleanup levels
- Excavation limits
- Future hangar footprint
- Block 4 Lot 2

**NOTES:**

J Estimated concentration, detected greater than the detection limit and less than the limit of quantitation. Flag applied by the laboratory.  
 < Analyte not detected; listed as less than the reporting limit unless otherwise flagged due to quality-control failures.  
 bgs below ground surface



|  |            |
|--|------------|
| Fairbanks International Airport<br>Fairbanks, Alaska   |            |
| <b>SUBSURFACE SOIL<br/>SAMPLE RESULTS</b>  |            |
| January 2021   | 102519-014 |
| <b>SHANNON &amp; WILSON, INC.</b><br><small>GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS</small> |            |
| <b>Figure 3</b>  |            |

**LEGEND:**

|  |       |  |
|--|-------|--|
|  | BRL   | BUILDING RESTRICTION LINE                  |
|  | EP    | EXISTING EDGE OF PAVEMENT                  |
|  | EP    | PROPOSED EDGE OF PAVEMENT                  |
|  | EG    | EXISTING EDGE OF GRAVEL                    |
|  | EG    | EXISTING CONTOUR                           |
|  | EG    | EXISTING FENCE                             |
|  | G     | EXISTING GAS LINE                          |
|  | G     | PROPOSED GAS LINE                          |
|  | SS    | EXISTING SANITARY SEWER                    |
|  | SS    | PROPOSED SANITARY SEWER                    |
|  | W     | EXISTING WATER LINE                        |
|  | W     | PROPOSED WATER LINE                        |
|  | OH    | EXISTING OVERHEAD UTILITIES                |
|  | UGE   | EXISTING UNDERGROUND ELECTRIC              |
|  | UGE   | PROPOSED UNDERGROUND ELECTRIC              |
|  |       | FILL EXTENTS                               |
|  |       | PROPERTY LINE                              |
|  |       | PROPOSED CONTOUR                           |
|  |       | PROPOSED FENCE                             |
|  | TOP   | EXISTING TOP OF EMBANKMENT                 |
|  | TOP   | PROPOSED TOP OF EMBANKMENT                 |
|  | TOE   | EXISTING TOE OF EMBANKMENT                 |
|  | TOE   | PROPOSED TOE OF EMBANKMENT                 |
|  |       | EXISTING TREELINE                          |
|  | DITCH | DITCH LINE                                 |
|  |       | EXISTING LIGHT                             |
|  |       | PROPOSED BOLLARDS                          |
|  |       | CLEANOUT                                   |
|  |       | EXISTING COMM PEDESTAL                     |
|  |       | EXISTING GUY ANCHOR                        |
|  |       | EXISTING PROPERTY CORNER, CONTROL MONUMENT |
|  |       | EXISTING SIGN                              |
|  |       | EXISTING UTILITY POLE                      |
|  |       | NEW UTILITY POLE                           |
|  |       | ELECTRICAL TRANSFORMER                     |
|  |       | FLOW DIRECTION                             |
|  |       | SURVEY SET REBAR & CAP                     |
|  |       | WATER SURFACE LEVEL                        |
|  |       | DEMOLITION                                 |
|  |       | CONCRETE SURFACE                           |
|  |       | ASPHALT SURFACE                            |
|  | SS    | SANITARY SEWER MANHOLE                     |
|  |       | TEMPORARY BENCH MARK                       |
|  |       | HEADBOLT OUTLET                            |

**ABBREVIATIONS:**

|            |                                     |
|------------|-------------------------------------|
| €          | CENTER LINE                         |
| AC         | ASPHALT CONCRETE                    |
| ADOT       | ALASKA DEPARTMENT OF TRANSPORTATION |
| APPROX     | APPROXIMATE                         |
| BLDG       | BUILDING                            |
| BOTT       | BOTTOM                              |
| BP         | ALIGNMENT BEGINNING OF PROJECT      |
| BRL        | BUILDING RESTRICTION LINE           |
| BTM EX     | BOTTOM OF EXCAVATION                |
| CO         | CLEANOUT                            |
| CONC       | CONCRETE                            |
| CMP        | CORRUGATED METAL PIPE               |
| CU         | COPPER                              |
| Ø          | DIAMETER                            |
| DEMO       | DEMOLITION                          |
| DIP        | DUCTILE IRON PIPE                   |
| EL, ELEV   | ELEVATION                           |
| EP         | EDGE OF PAVEMENT                    |
| EX, (E)    | EXISTING                            |
| F          | FIRE PROTECTION                     |
| FDC        | FIRE DEPARTMENT CONNECTION          |
| FF/FFE     | FINISHED FLOOR ELEVATION            |
| FG         | FINISHED GRADE                      |
| HBH        | HEADBOLT HEATER                     |
| HDPE       | HIGH DENSITY POLYETHYLENE           |
| HMA        | HOT MIX ASPHALT                     |
| ID         | INSIDE DIAMETER                     |
| IE/I.E.    | INVERT ELEVATION                    |
| LT         | LEFT                                |
| ±ME        | MATCH EXISTING GRADE                |
| MAX        | MAXIMUM                             |
| MIL        | ONE-THOUSANDTH OF AN INCH           |
| MIN        | MINIMUM                             |
| NTS        | NOT TO SCALE                        |
| OC         | ON CENTER                           |
| OD         | OUTSIDE DIAMETER                    |
| OHE        | OVERHEAD ELECTRIC                   |
| PCC        | PORTLAND CONCRETE CEMENT            |
| PE         | POLYETHYLENE                        |
| R          | RADIUS                              |
| REQ'D      | REQUIRED                            |
| RT         | RIGHT                               |
| R/W, R.O.W | RIGHT OF WAY                        |
| SF         | SQUARE FOOT                         |
| STD DWG    | STANDARD DRAWING                    |
| SS         | SANITARY SEWER                      |
| S/W        | SIDEWALK                            |
| SD         | STORM DRAIN                         |
| TBM        | TEMPORARY BENCH MARK                |
| TOC        | TOP OF CONCRETE                     |
| TYP        | TYPICAL                             |
| T          | UNDERGROUND TELEPHONE LINE          |
| UD         | UTILIDUCT                           |
| UGE        | UNDERGROUND ELECTRIC                |
| USA        | UTILITY SERVICES OF ALASKA          |
| W          | WATER                               |
| W/         | WITH                                |

**NOTES:**

1. ALL UTILITY CONSTRUCTION SHALL CONFORM TO CURRENT UTILITY SERVICES OF ALASKA (USA) STANDARDS OF CONSTRUCTION.
2. ALASKA DIG LINE MUST BE CONTACTED AND ALL EXISTING UTILITIES LOCATED BEFORE COMMENCING GROUND DISTURBING ACTIVITIES.
3. WATER AND SANITARY SEWER MAINS TO BE FIELD LOCATED AND VERIFIED PRIOR TO CONSTRUCTION. TIE IN LOCATIONS SHOWN BASED UPON SYSTEM MAPS AND UTILITY LOCATED ADJACENT TO SITE. PDC TO CONFIRM LOCATION IN JULY OF 2020.



Alaska Hangar

Fairbanks, AK

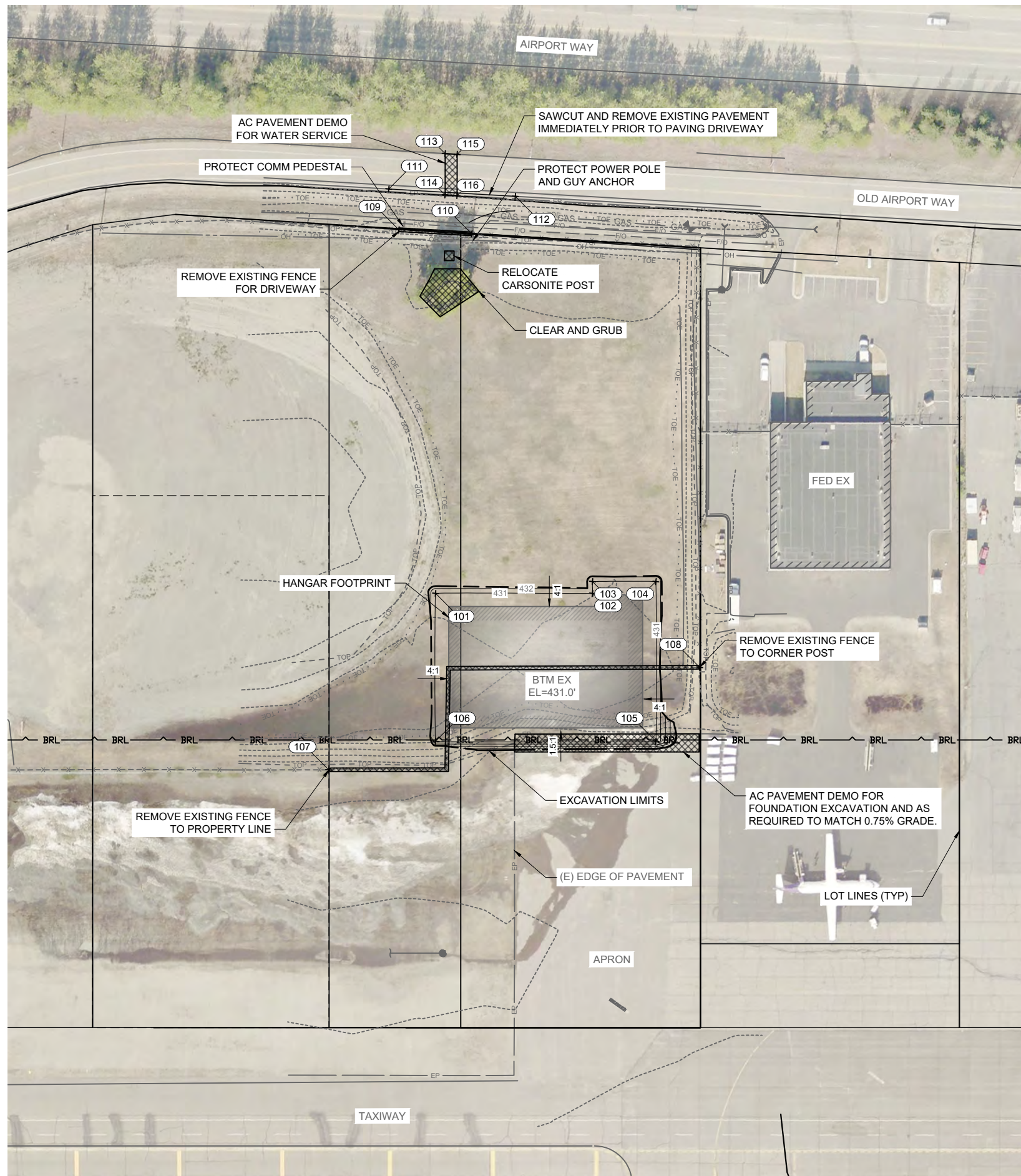
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**GENERAL NOTES AND LEGEND**

|                |            |
|----------------|------------|
| Project number | 19319FB    |
| Date           | 07/03/2020 |
| Drawn by       | DES        |
| Checked by     | KAB        |
| <b>C-001</b>   |            |
| Scale          | As Noted   |

**DETAIL AND SECTION IDENTIFICATION**





**NOTES:**

1. MAINTAIN A SECURE FENCELINE TO AIRFIELD AT ALL TIMES DURING CONSTRUCTION. COORDINATE DEMOLITION OF EXISTING FENCES WITH AIRPORT MANAGER.
2. OBTAIN UTILITY LOCATES PRIOR TO EXCAVATION. SITE CONTAINS ABANDONED 10 GA WATERLINE APPROXIMATELY HALFWAY ACROSS SITE. DO NOT DISTURB EXISTING UTILITIES WITHOUT ADVANCE AUTHORIZATION FROM UTILITY COMPANY.
3. PROPOSED FOUNDATION PREPARATION IS DESIGNED BASED UPON THE RECOMMENDATIONS PROVIDED IN THE GEOTECHNICAL REPORT PREPARED BY PDC ON FEBRUARY 27, 2020. SEE REPORT FOR BORELOGS AND FOUNDATION PREPARATION REQUIREMENTS. THE APPROXIMATE DEPTH TO GROUNDWATER AND SAND/GRAVEL LAYER AT THE TIME OF SUBSURFACE EXPLORATION HAS BEEN DEPICTED ON C-401 SITE SECTIONS FOR REFERENCE.
4. REMOVE ALL SURFACE ORGANICS AND DELETERIOUS MATERIALS WITHIN PAD AND ACCESS ROAD FOOTPRINT PRIOR TO PLACEMENT OF FILL.



**PDC ENGINEERS**  
**PLAN • DESIGN • CONSTRUCT**  
 A E S P E C COMPANY  
 1028 Aurora Dr., Fairbanks, AK 99709  
 907.452.1414 | A E C C 6 0 5

Alaska Hangar

Fairbanks, AK

| No. | Description | Date |
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**SITE DEMOLITION**

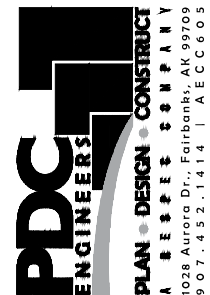
Project number 19319FB  
 Date 07/03/2020  
 Drawn by DES  
 Checked by KAB

**CD-001**  
 Scale As Noted



**NOTES:**

1. MAINTAIN A SECURE FENCELINE TO AIRFIELD AT ALL TIMES DURING CONSTRUCTION. COORDINATE DEMOLITION OF EXISTING FENCES WITH AIRPORT MANAGER.
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Alaska Hangar

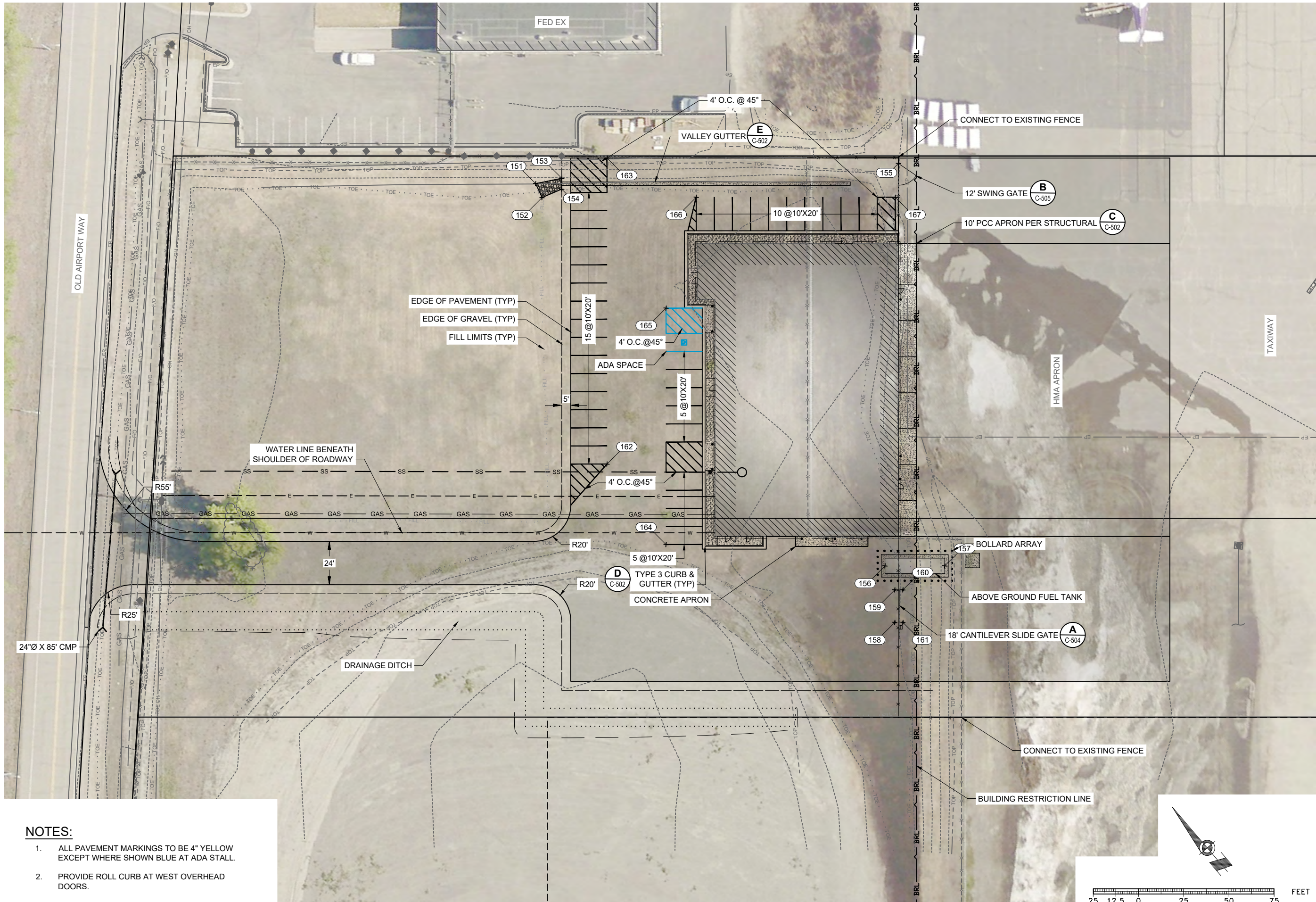
Fairbanks, AK

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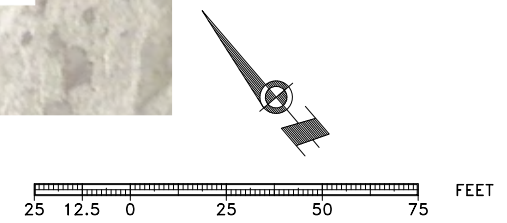
**OVERALL SITE PLAN**

Project number 19319FB  
 Date 07/03/2020  
 Drawn by DES  
 Checked by KAB

**C-101**  
 Scale As Noted



- NOTES:**
- ALL PAVEMENT MARKINGS TO BE 4" YELLOW EXCEPT WHERE SHOWN BLUE AT ADA STALL.
  - PROVIDE ROLL CURB AT WEST OVERHEAD DOORS.



**PDC ENGINEERS**  
**PLAN • DESIGN • CONSTRUCT**  
 ENGINEERS  
 KAREN ANN BRADY  
 LICENSED PROFESSIONAL ENGINEER  
 1028 Aurora Dr., Fairbanks, AK 99709  
 907.452.1414 | A E C C 6 0 5

Alaska Hangar

Fairbanks, AK

| No. | Description | Date |
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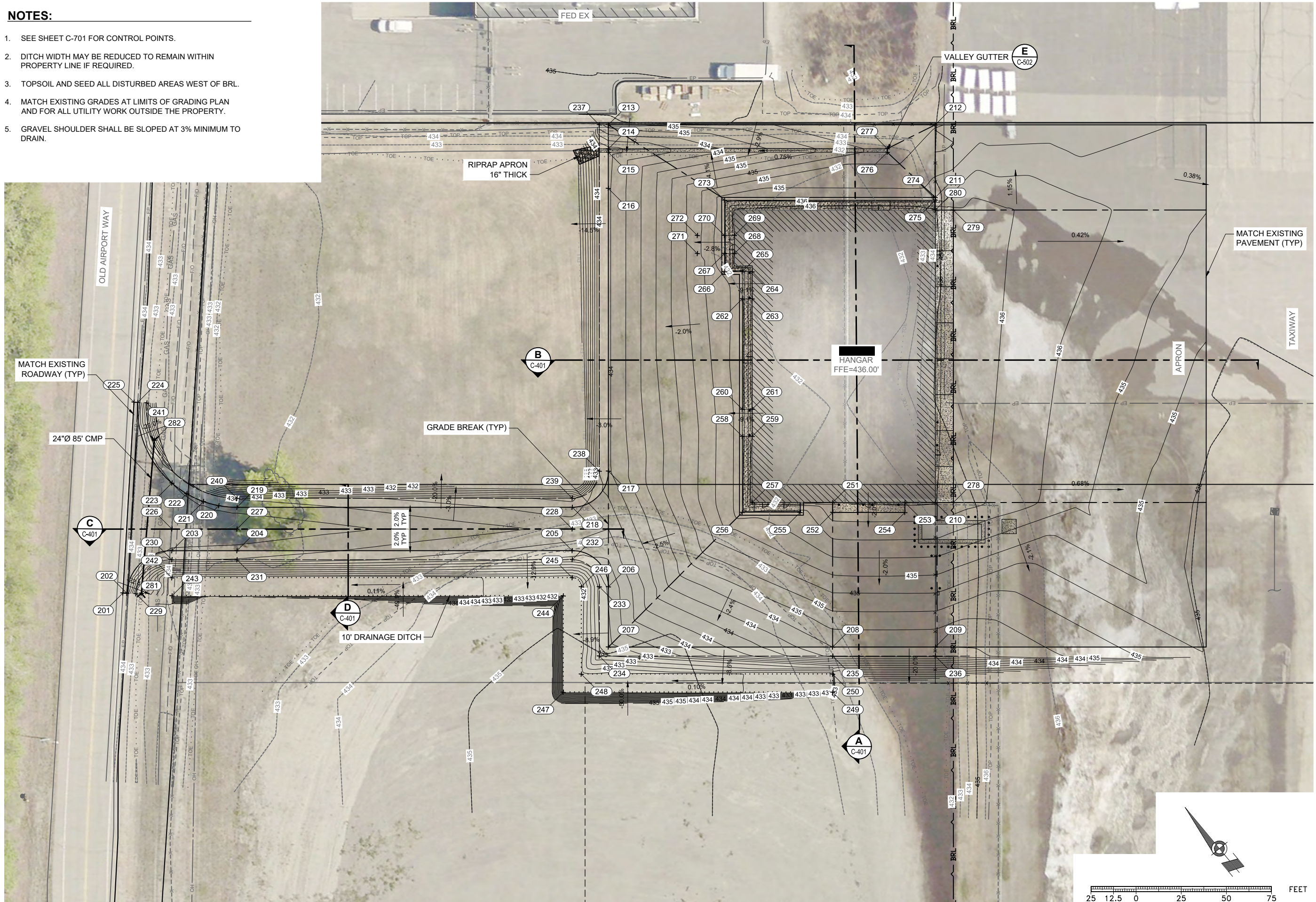
**SITE PLAN**

Project number 19319FB  
 Date 07/03/2020  
 Drawn by DES  
 Checked by KAB

**C-102**  
 Scale As Noted

**NOTES:**

1. SEE SHEET C-701 FOR CONTROL POINTS.
2. DITCH WIDTH MAY BE REDUCED TO REMAIN WITHIN PROPERTY LINE IF REQUIRED.
3. TOPSOIL AND SEED ALL DISTURBED AREAS WEST OF BRL.
4. MATCH EXISTING GRADES AT LIMITS OF GRADING PLAN AND FOR ALL UTILITY WORK OUTSIDE THE PROPERTY.
5. GRAVEL SHOULDER SHALL BE SLOPED AT 3% MINIMUM TO DRAIN.

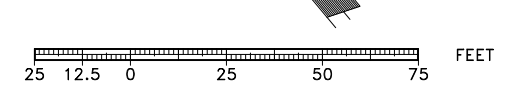


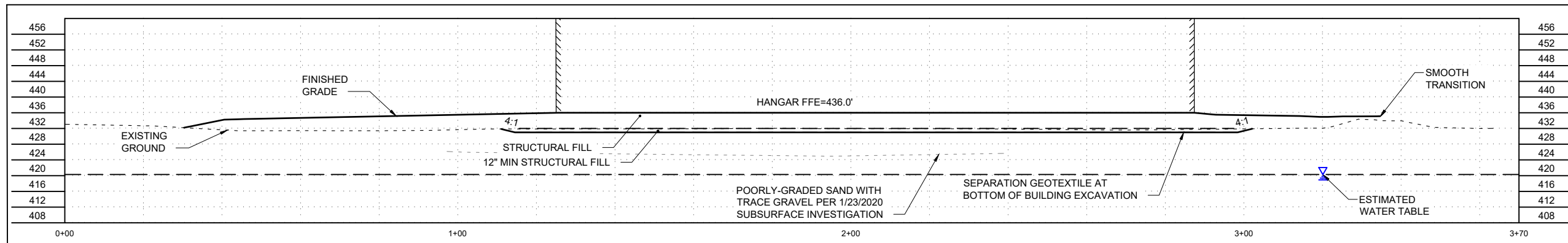
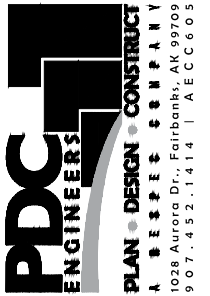
Alaska Hangar  
Fairbanks, AK

| No. | Description | Date |
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**SITE GRADING**

|                |            |
|----------------|------------|
| Project number | 19319FB    |
| Date           | 07/03/2020 |
| Drawn by       | DES        |
| Checked by     | KAB        |
| <b>C-201</b>   |            |
| Scale          | As Noted   |

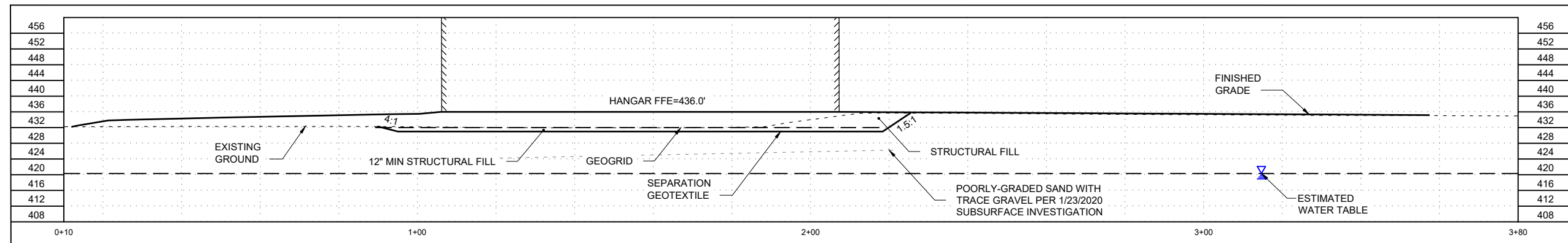




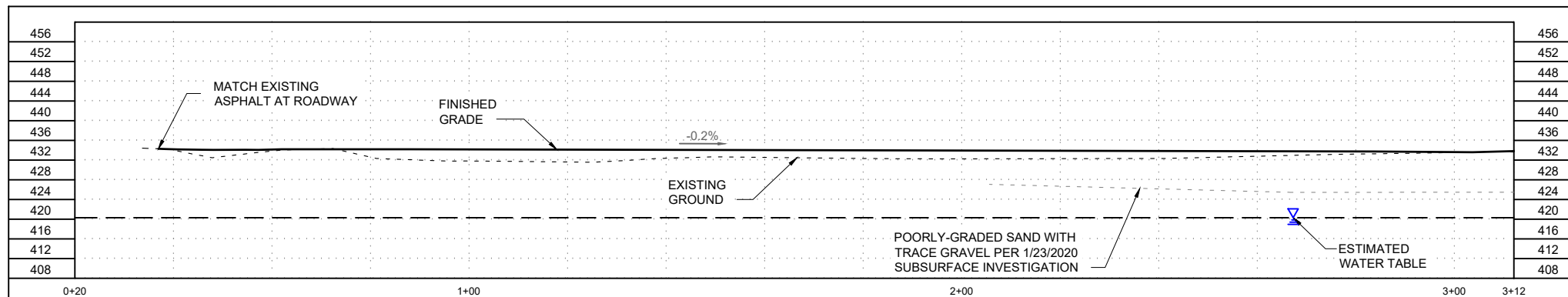
**A** SITE SECTION: PARALLEL TO BUILDING  
C-401

**NOTES:**

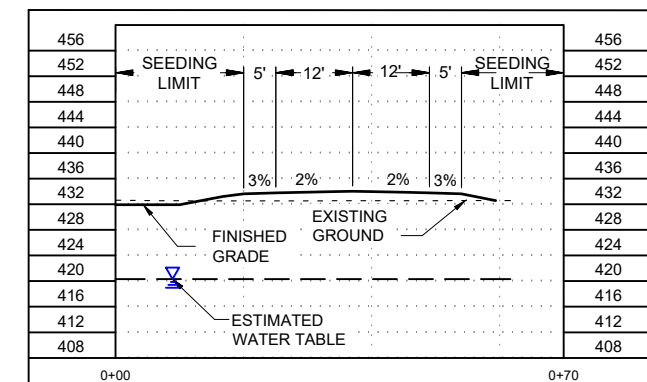
- SEE STRUCTURAL FOR FOUNDATION AND SLAB REQUIREMENTS.
- SEE SHEET C-502 FOR TYPICAL PAVEMENT SECTIONS, AND PLANS FOR PAVEMENT LOCATION.
- SEPARATION GEOTEXTILE SHALL BE MIRAFI RS580i, INSTALLED TO MANUFACTURER'S INSTRUCTIONS. SEAMS SHALL BE OVERLAPPED A MINIMUM OF 36 INCHES OR SEWN.



**B** SITE SECTION: PERPENDICULAR TO BUILDING  
C-401



**C** SITE SECTION: DRIVEWAY  
C-401



**D** SITE SECTION: ACROSS ACCESS ROAD  
C-401

Alaska Hangar

Fairbanks, AK

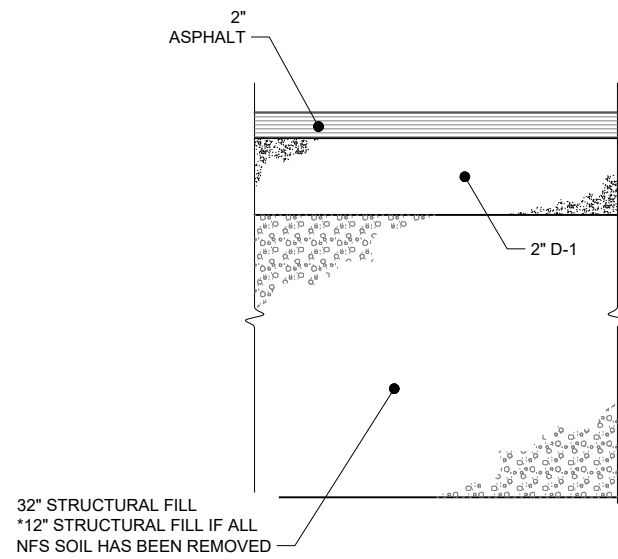
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**SITE SECTIONS**

|                |            |
|----------------|------------|
| Project number | 19319FB    |
| Date           | 07/03/2020 |
| Drawn by       | DES        |
| Checked by     | KAB        |

**C-401**

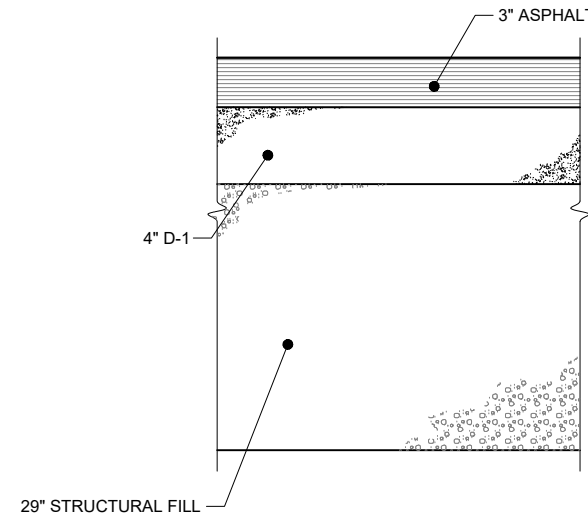
Scale As Noted



**NOTES:**

1. APPLIES TO ACCESS DRIVEWAY AND PARKING AREA WEST OF BRL.

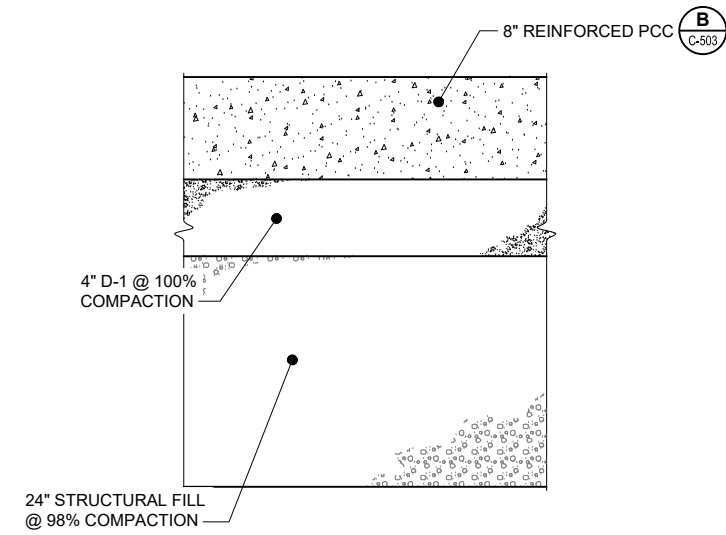
**A** **NON-AIRFIELD HMA TYPICAL SECTION**  
C-502 N.T.S.



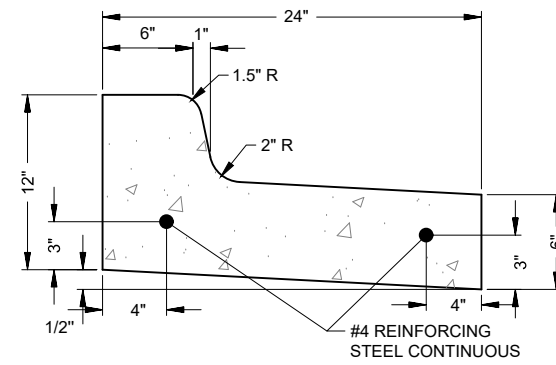
**NOTES:**

1. APPLIES TO ALL HMA PAVEMENT EAST OF BRL.

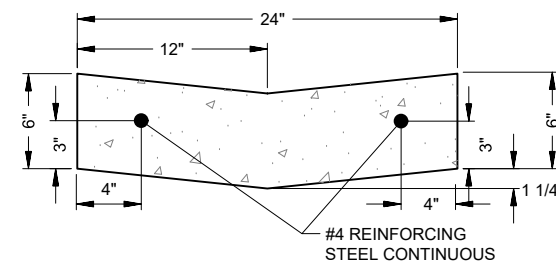
**B** **AIRFIELD HMA APRON TYPICAL SECTION**  
C-502 N.T.S.



**C** **PCC-APRON TYPICAL SECTION**  
C-502 N.T.S.



**D** **DETAIL: TYPE 3 CURB**  
C-502 N.T.S.



**E** **DETAIL: VALLEY CURB**  
C-502 N.T.S.



Alaska Hangar

Fairbanks, AK

| No. | Description | Date |
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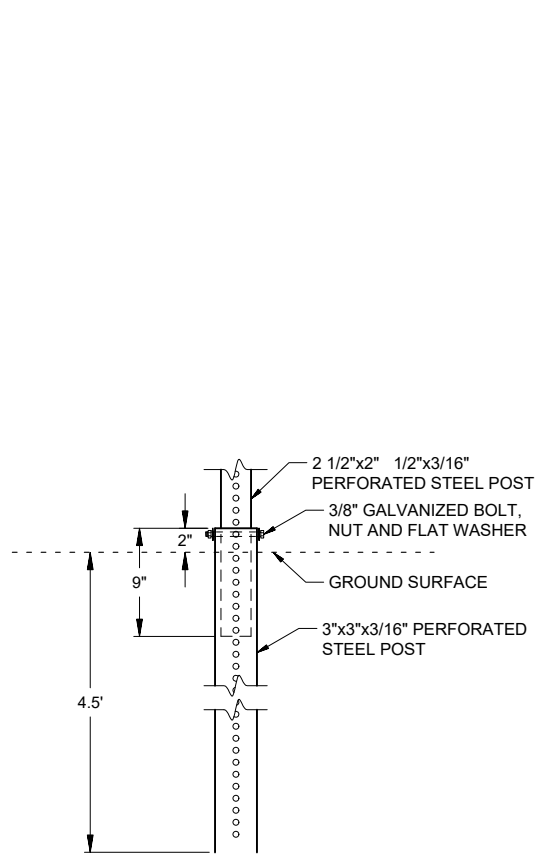
**DETAILS  
(2 OF 5)**

|                |            |
|----------------|------------|
| Project number | 19319FB    |
| Date           | 07/03/2020 |
| Drawn by       | DES        |
| Checked by     | KAB        |

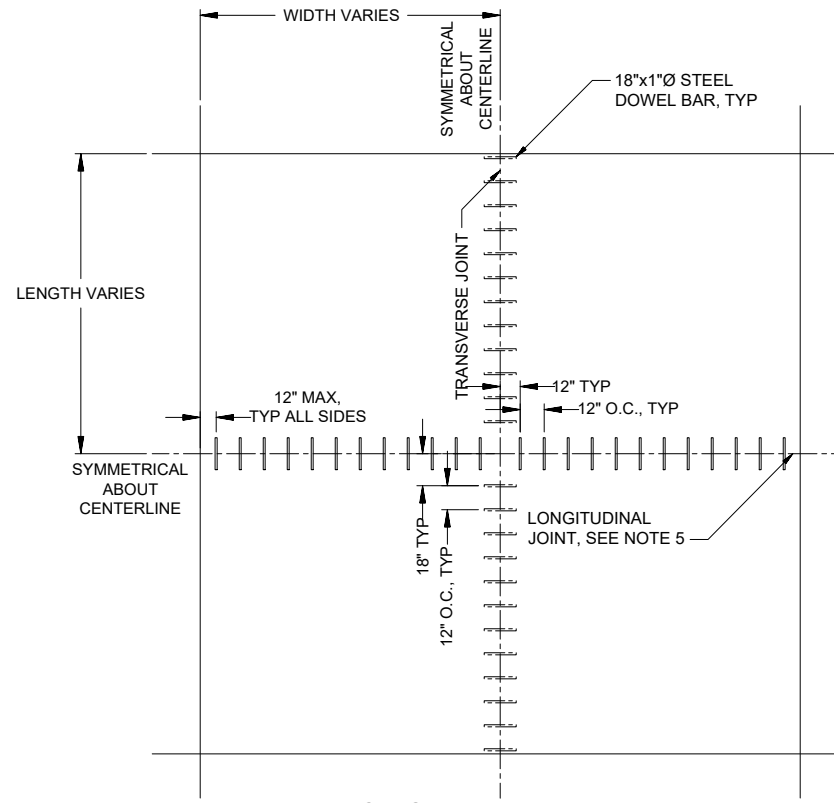
**C-502**

Scale As Noted



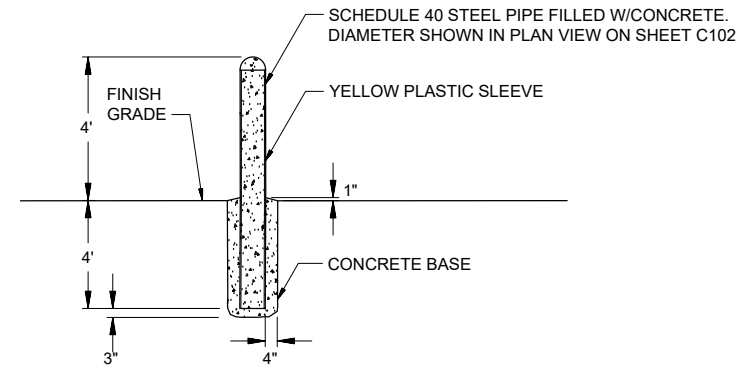


**A** **DETAIL: SIGN POST EMBEDMENT**  
C-503 N.T.S.



**NOTES:**  
1. MULTIPLE QUADRANT JOINTS SHOWN FOR REFERENCE ONLY, IN THE EVENT AN INCREASE IS DESIRED DURING CONSTRUCTION.

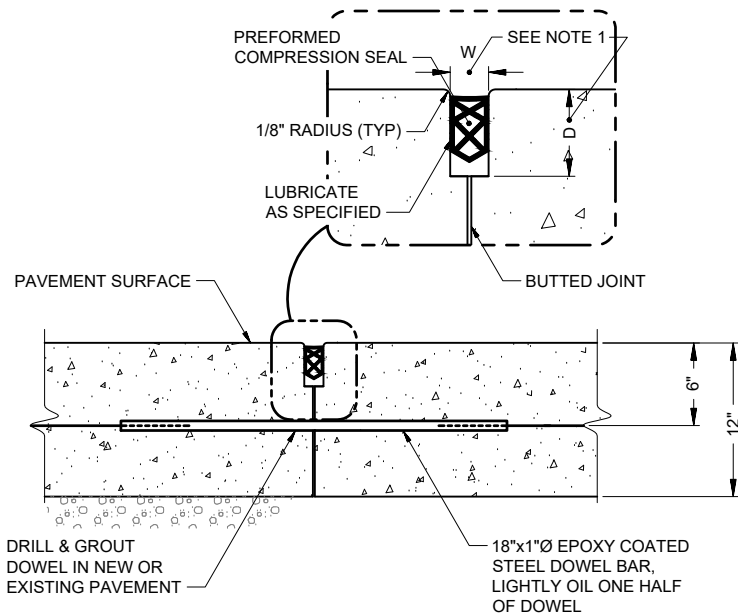
**B** **DETAIL: DOWEL SPACING**  
C-503 N.T.S.



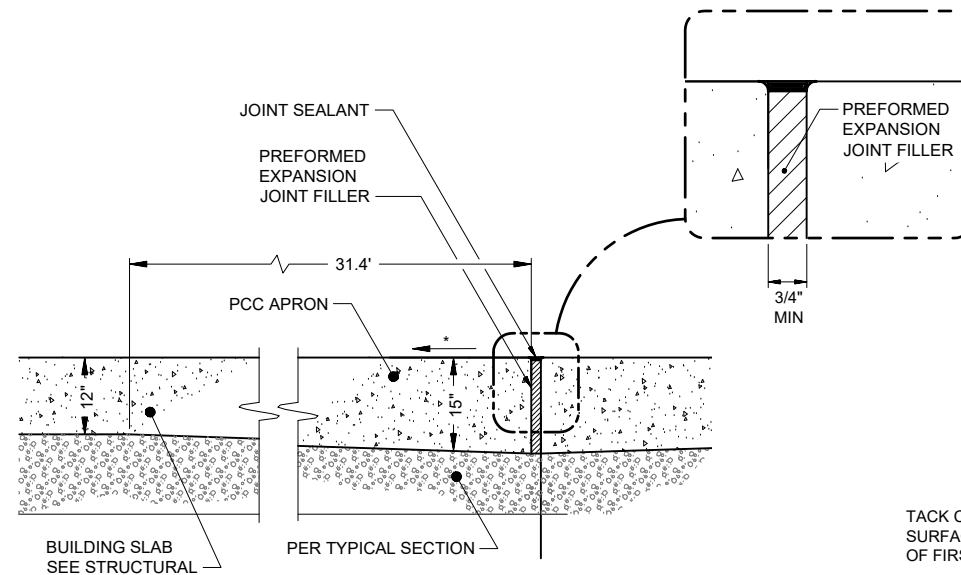
**NOTES:**

- BOLLARDS TO BE PLACED 2' FROM OBJECT THEY ARE PROTECTING, UNLESS OTHERWISE CONTROLLED.
- BOLLARDS AT OVERHEAD DOORS SHALL BE PLACED 1' FROM BUILDING AND AT AN EQUAL DISTANCE FROM EACH OTHER AS THE DOOR OPENING THEY PROTECT.

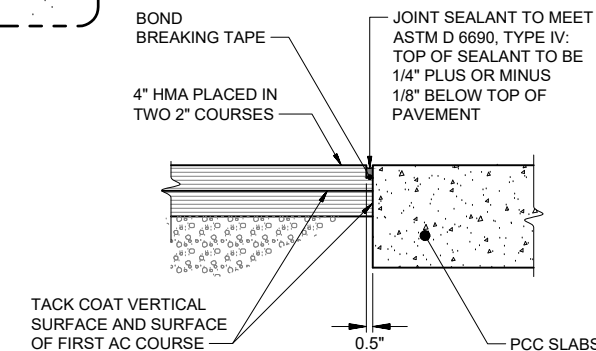
**C** **DETAIL: BOLLARD**  
C-503 N.T.S.



**D** **DETAIL: PCC APRON LONGITUDINAL & TRANSVERSE JOINT**  
C-503 N.T.S.



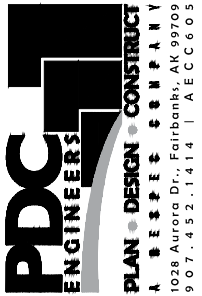
**E** **TYPICAL SECTION: THICKENED EDGE EXPANSION JOINT**  
C-503 N.T.S.



**F** **DETAIL: PCC-HMA JOINT SEAL**  
C-503 N.T.S.

**PCC APRON NOTES:**

- DEPTH (D) AND WIDTH (W) OF CONCRETE GROOVE SHALL BE AS RECOMMENDED BY MANUFACTURER, EXCEPT THE DEPTH SHALL NOT BE LESS THAN 1.5 INCHES. WIDTH (W), 1/2 INCH MINIMUM TO 5/8 INCH MAXIMUM.
- TOP OF PREFORMED SEAL SHALL BE 1/4 INCH,  $\pm 1/8$  INCH BELOW THE PAVEMENT SURFACE. IN AREAS TO BE GROOVED, THE JOINT SEAL SHALL BE RECESSED BELOW THE DEPTH OF THE GROOVES.
- THE NOMINAL WIDTH OF THE UNCOMPRESSED SEAL SHALL BE 1 INCH.
- COMPRESSION SEALS MUST BE IN COMPRESSION AT ALL TIMES.
- DOWELS IN TRANSVERSE JOINTS SHALL NOT BE CLOSER THAN 18" TO LONGITUDINAL JOINTS; DOWELS IN LONGITUDINAL JOINTS SHALL NOT BE CLOSER THAN 12" TO TRANSVERSE JOINTS.
- THE PCC APRON CONCRETE SHALL BE PROPORTIONED TO ACHIEVE A 7-DAY FLEXURAL STRENGTH THAT MEETS A FLEXURAL STRENGTH OF 650 PSI PER ASTM C78. THE MIX SHALL BE DEVELOPED USING THE PROCEDURES CONTAINED IN THE PORTLAND CEMENT ASSOCIATION'S (PCA) PUBLICATION, "DESIGN AND CONTROL OF CONCRETE MIXTURES".
- DOWEL BARS SHALL BE PLAIN STEEL BARS CONFORMING TO ASTM A615 AND SHALL BE FREE FROM BURRING OR OTHER DEFORMATION RESTRICTING SLIPPAGE IN THE CONCRETE. BEFORE DELIVERY TO THE CONSTRUCTION SITE EACH DOWEL BAR SHALL BE EPOXY COATED PER ASTM A1078. THE DOWELS SHALL BE COATED WITH A BOND-BREAKER RECOMMENDED BY THE MANUFACTURER.



Alaska Hangar

Fairbanks, AK

| No. | Description | Date |
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**DETAILS (3 OF 5)**

|                |            |
|----------------|------------|
| Project number | 19319FB    |
| Date           | 07/03/2020 |
| Drawn by       | DES        |
| Checked by     | KAB        |
| <b>C-503</b>   |            |
| Scale          | As Noted   |



**PDC ENGINEERS**  
**PLAN • DESIGN • CONSTRUCT**  
 A B E S T E C O M P A N Y  
 1028 Aurora Dr., Fairbanks, AK 99709  
 907.452.1414 | A E C C 605

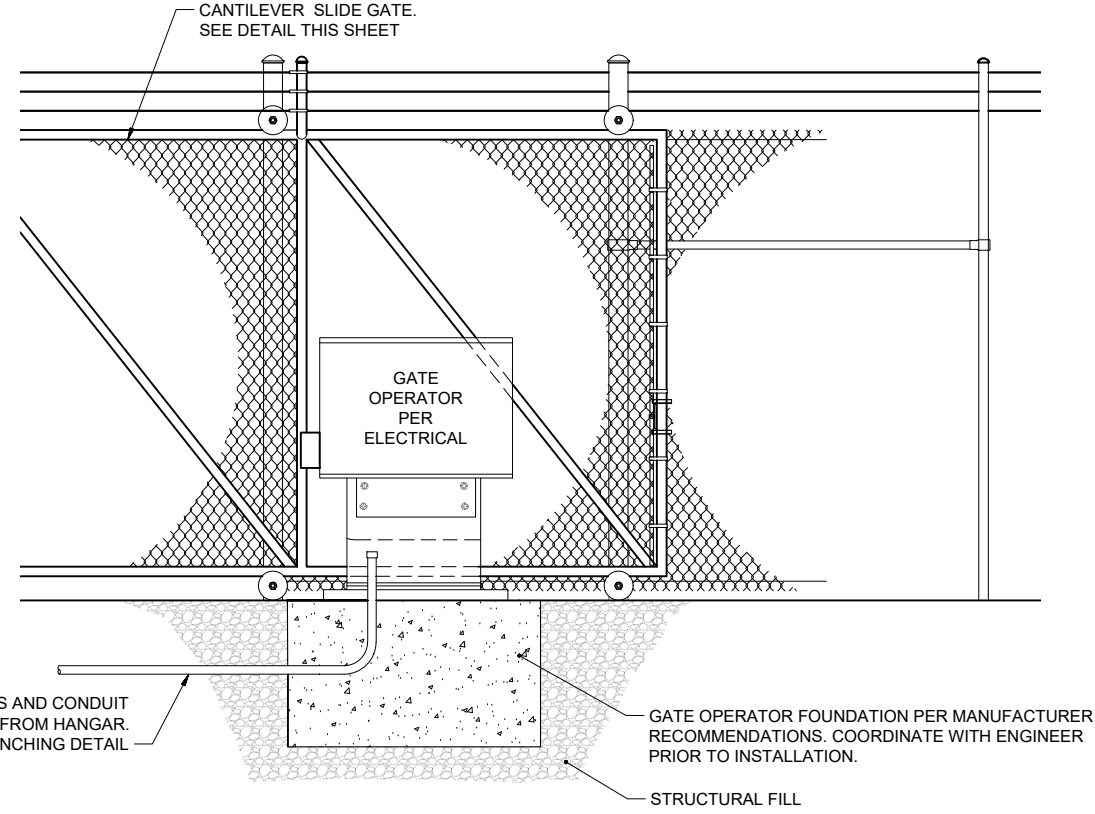
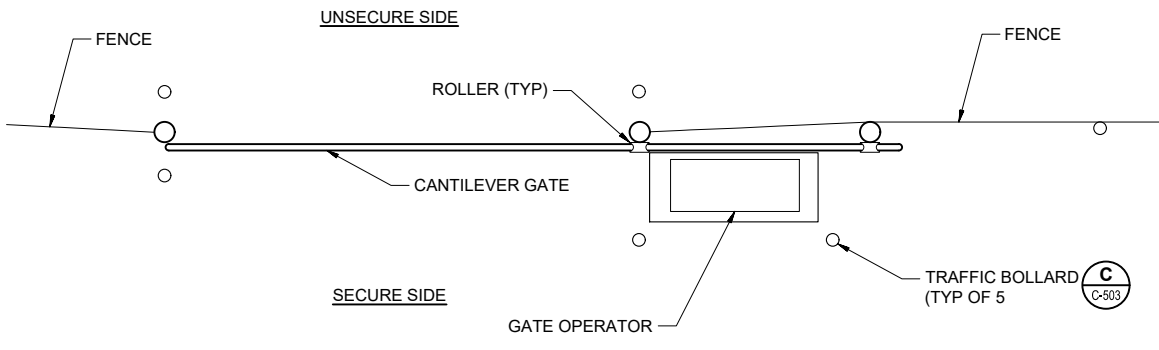
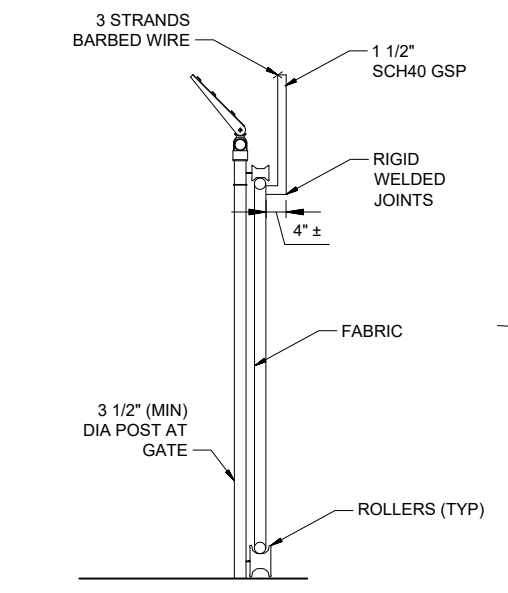
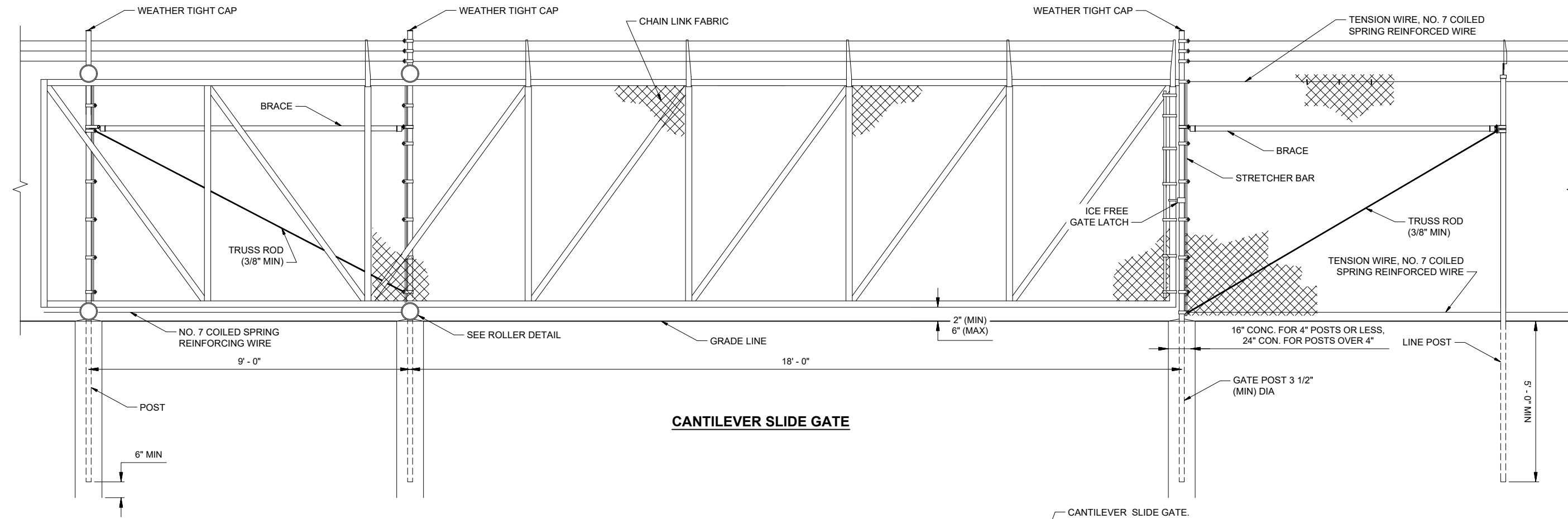
Alaska Hangar  
 Fairbanks, AK

| No. | Description | Date |
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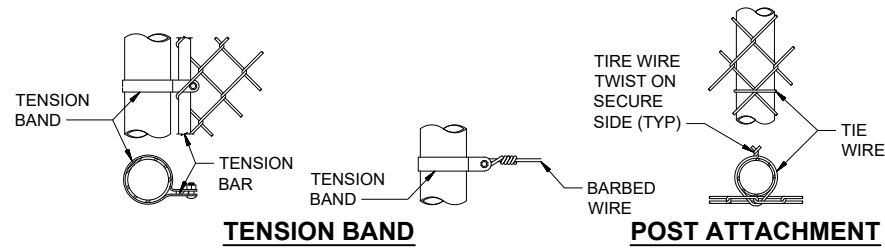
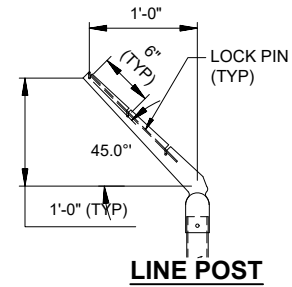
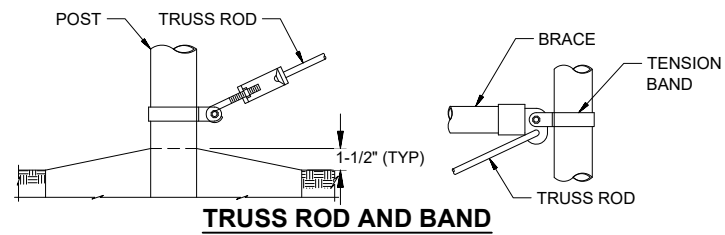
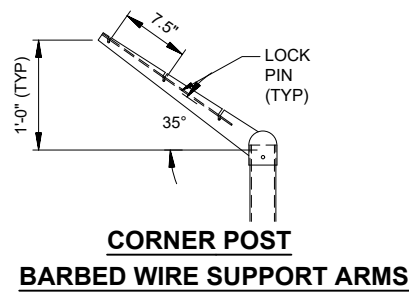
**DETAILS  
(4 OF 5)**

Project number 19319FB  
 Date 07/03/2020  
 Drawn by DES  
 Checked by KAB

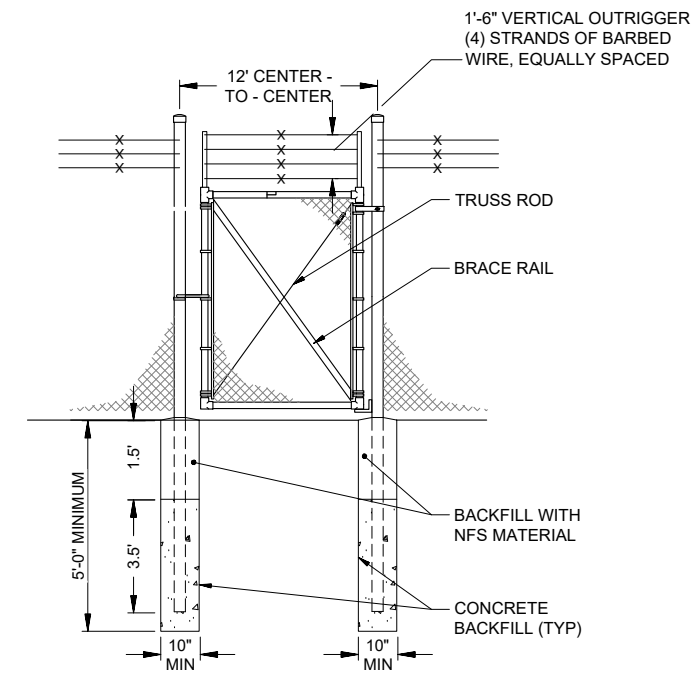
**C-504**  
 Scale As Noted



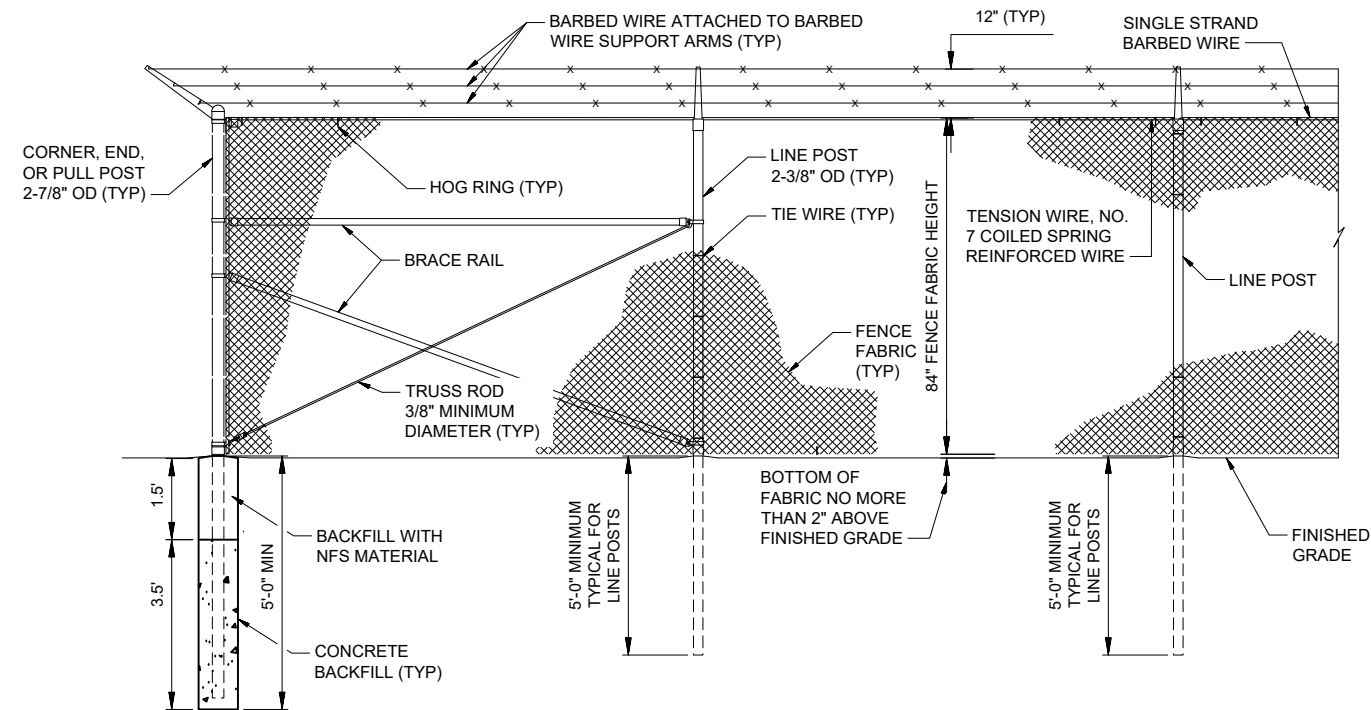
**DETAIL:  
A CANTILEVER SLIDE GATE**  
 C-504 N.T.S.



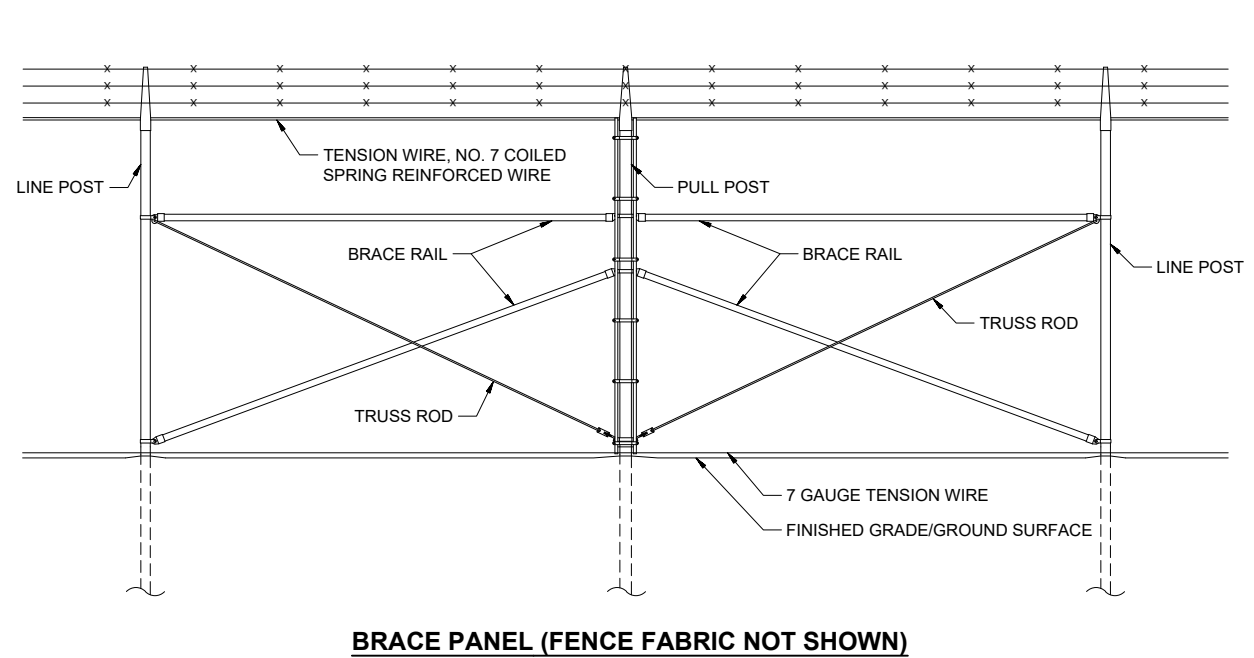
**A** **DETAIL: FASTENING**  
C-505 N.T.S.



**B** **ELEVATION: SWING GATE**  
C-505 N.T.S.



**C** **DETAIL: SECURITY FENCE**  
C-505 N.T.S.



**BRACE PANEL (FENCE FABRIC NOT SHOWN)**



Alaska Hangar

Fairbanks, AK

| No. | Description | Date |
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**DETAILS (5 OF 5)**

|                |            |
|----------------|------------|
| Project number | 19319FB    |
| Date           | 07/03/2020 |
| Drawn by       | DES        |
| Checked by     | KAB        |

**C-505**

Scale As Noted



**Table 1 - Summary of Soil Sample Analytical Results**

| Sample Name  |                     |       | 20FAI-LM-01                 | 20FAI-LM-02 | 20FAI-LM-03 | 20FAI-LM-04 | 20FAI-LM-05 | 20FAI-LM-06           | 20FAI-LM-07                   | 20FAI-LM-08               |         | 20FAI-LM-09                     | 20FAI-LM-10                     |
|--|---------------------|-------|-----------------------------|-------------|-------------|-------------|-------------|-----------------------|-------------------------------|---------------------------|---------|---------------------------------|---------------------------------|
| Description  |                     |       | Hangar footprint, ≤1 ft bgs |             |             |             |             | Hangar,<br>2.2 ft bgs | Utility center,<br>0.7 ft bgs | Utility center, 4.5 ft bg |         | Utility northwest,<br>4.5 ft bg | Utility southeast,<br>4.5 ft bg |
| Analyte  | DEC Cleanup Level † | Units | 7/23/20                     | 7/23/20     | 7/23/20     | 7/23/20     | 7/23/20     | 7/23/20               | 7/23/20                       | 7/24/20                   | 7/24/20 | 7/24/20                         | 7/24/20                         |
| Perfluoro-hexane sulfonic acid (PFHxS)                             | --                  | µg/kg | 0.20 J                      | 0.033 J     | 0.056 J     | <0.20       | 1.1 J*      | 0.064 J               | <0.20                         | 0.034 J                   | 0.033 J | 0.090 J                         | 0.081 J                         |
| Perfluorohexanoic acid (PFHxA)                                     | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | 0.39        | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Perfluoro-heptanoic acid (PFHpA)                                   | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Perfluoro-nonanoic acid (PFNA)                                     | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Perfluoro-butane sulfonic acid (PFBS)                              | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Perfluorodecanoic acid (PFDA)                                      | --                  | µg/kg | <0.22                       | 0.027 J     | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Perfluoroundecanoic acid (PFUnA)                                   | --                  | µg/kg | 0.13 J                      | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Perfluoro-dodecanoic acid (PFDoA)                                  | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Perfluorotridecanoic acid (PFTrDA)                                 | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Perfluoro-tetradecanoic acid (PFTeA)                               | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)        | --                  | µg/kg | <2.2                        | <2.0        | <2.1        | <2.0        | <2.8        | <2.2                  | <2.0                          | <2.0                      | <2.0    | <2.0                            | <2.4                            |
| N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)         | --                  | µg/kg | <2.2                        | <2.0        | <2.1        | <2.0        | <2.8        | <2.2                  | <2.0                          | <2.0                      | <2.0    | <2.0                            | <2.4                            |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)    | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS) | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| 4,8-Dioxa-3H-perfluorononanoic acid (DONA)                         | --                  | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | <0.28       | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |
| Hexafluoropropylene oxide dimer acid (HFPO-DA)                     | --                  | µg/kg | <0.28                       | <0.25       | <0.26       | <0.25       | <0.35       | <0.27                 | <0.26                         | <0.25                     | <0.25   | <0.25                           | <0.30                           |
| Perfluorooctanesulfonic acid (PFOS)                                | 3.0                 | µg/kg | 0.82 JH*                    | 1.2         | 1.0         | 0.25 J      | 0.30 J      | 0.30 J                | <0.51                         | <0.49                     | <0.51   | <0.50                           | <0.60                           |
| Perfluorooctanoic acid (PFOA)                                      | 1.7                 | µg/kg | <0.22                       | <0.20       | <0.21       | <0.20       | 0.20 J      | <0.22                 | <0.20                         | <0.20                     | <0.20   | <0.20                           | <0.24                           |

µg/kg micrograms per kilogram

† Alaska Department of Environmental Conservation (DEC) under-40-inch zone migration-to-groundwater soil cleanup level

-- Cleanup level not established

bgs below ground surface

&lt; 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 method detection limit (MDL) and less than the RL. Flag applied by the laboratory.

J\* Result considered estimated due to a QC failure. Flag applied by Shannon &amp; Wilson, Inc.

JH\* Result considered estimated, biased high, due to a QC failure. Flag applied by Shannon &amp; Wilson, Inc.

FIELD ACTIVITIES DAILY LOG

Date 7/23/20

Sheet 1 of 1

Project No. 102519-014

Project Name: Block 4 Lot 2 FAI [redacted] hangar

Field activity subject: surface soil and subsurface soil sample collection (PFA's)

Description of daily activities and events:

1430 - arrived onsite, met with Katrina to gain access to the site. Matt arrived to unlock gate. Discussed securing the gate. Told to lock gate after done and notify operations.

1440 - began walking site - Ashley and Adam. Adam set up GPS for sample collection. Began digging to collect samples. Adam collected GPS points for each location. Ashley collected the samples.

1520 - Sample 20FAI-LM-02 collected -> surface, footprint

1526 - Sample 20FAI-LM-01 collected -> surface, footprint

1545 - Sample 20FAI-LM-03 collected -> surface, footprint

1554 - Sample 20FAI-LM-04 collected -> surface, footprint

1622 - Sample 20FAI-LM-05 collected -> subsurface, footprint

1630 - Sample 20FAI-LM-06 collected -> subsurface, footprint

1636 - Sample 20FAI-LM-07 collected -> surface, utilities

1645 - offsite, called operations to inform them we were offsite and gate had been locked

1655 - arrived at office, samples were checked for completeness and stored with the chain-of-custody in the environmental lab fridge, to be submitted tomorrow (7/24/20).

Visitors on site: Katrina LeMieux and Matt McClurg - helped with site access

Changes from plans/specifications and other special orders and important decisions:

the 3 subsurface samples to be collected from the utilities area will be collected 7/24/20. Samples to be submitted tomorrow. Field duplicate will be collected 7/24/20.

Weather conditions: rain, sunny, cloudy ~ 65-70°F

Important telephone calls: Phoned operations to inform them we had left site.

Personnel on site: Ashley Jaramillo and Adam Wyborny

Signature: [Handwritten Signature]

Date: 7/23/20

FIELD ACTIVITIES DAILY LOG

Date 7/24/20

Sheet 1 of 1

Project No. 104519-014

Project Name: Block 4 Lot 2 FAI [redacted] hangar

Field activity subject: subsurface soil sample collection

Description of daily activities and events:

1115 - arrived onsite, Matt opened the gate. Discussed securing the gate. Told to lock gate after complete and to call Matt when complete

1120 - began staking out locations for the 3 subsurface samples to collect. Craig advanced 3 holes using a gas powered auger. Holes were further advanced to collect samples using a hand auger.

1224 - 20FAI-LM-88 (duplicate) and 20FAI-LM-08 (1234 times) collected -> subsurface, utilities

1232 - 20FAI-LM-10 collected -> subsurface, utilities

1245 - 20FAI-LM-09 collected -> subsurface, utilities

1305 - pin flagged sample locations names were written on flags after discussions with Katrina this morning.

1320 - backfilled holes to prevent tripping hazard broke down supplies + packed truck

1415 - offsite, called Matt to let him know we were offsite.

1430 - arrived at office, samples checked and stored with the chain-of-custody in environmental lab fridge to be shipped 7/27/20.

Visitors on site: Matt McClurg - helped w/access. GCI was also working adjacent to site to splice line to job trailer.

Changes from plans/specifications and other special orders and important decisions:

Misunderstood shipping <sup>timeline</sup>, samples are unable to ship today. Will be shipped on 7/27/20

Weather conditions: mostly cloudy ~65°F.

Important telephone calls: phone Matt to let him know we were offsite.

Personnel on site: Ashley Jaramillo and Craig Beebe

Signature: [Signature]

Date: 7/24/20

SOIL SAMPLE COLLECTION LOG

Project Number: 102519-014 Project Name: Block 4 Lot 2 FAI [Redacted] Hangar Page 1 of 1  
 Sampler: AMT/ARJ/CAB

| Date | Sample ID   | Location            | Sample Time | Depth (ft) | Sample Type | PID Reading | Analyses             |
|------|-------------|---------------------|-------------|------------|-------------|-------------|----------------------|
| 7/23 | 20FAI-LM-01 | Hangar - SE quad    | ~11E        | 1526       | ~0.4FT      | ES          | PFAS 537.1M x18<br>↓ |
| 7/23 | 20FAI-LM-02 | Hangar - NE quad    | ~0.4FE      | 1520       | ~0.4FT      | ES          |                      |
| 7/23 | 20FAI-LM-03 | Hangar - NW quad    |             | 1545       | ~0.7FE      | ES          |                      |
| 7/23 | 20FAI-LM-04 | Hangar - SW quad    |             | 1554       | ~0.4FE      | ES          |                      |
| 7/23 | 20FAI-LM-05 | Hangar - south half |             | 1622       | ~1.8FE      | ES          |                      |
| 7/23 | 20FAI-LM-06 | Hangar - north half |             | 1630       | ~2.2FE      | ES          |                      |
| 7/23 | 20FAI-LM-07 | utilities - center  |             | 1636       | ~0.7FE      | ES          |                      |
| 7/24 | 20FAI-LM-08 | utilities - center  |             | 1234       | ~4-4.5FE    | ES          |                      |
| 7/24 | 20FAI-LM-09 | utilities - west    |             | 1245       | ~4-4.5FE    | ES          |                      |
| 7/24 | 20FAI-LM-10 | utilities - east    |             | 1232       | ~4-4.5FE    | ES          |                      |
| 7/24 | 20FAI-LM-88 | utilities - center  |             | 1224       | ~4-4.5FE    | FD          |                      |

Sample Type FS = Field screening measurement only ES = Environmental sample FD = Field duplicate TB = Trip blank



## ANALYTICAL REPORT

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

Laboratory Job ID: 320-63125-1

Client Project/Site: Fairbanks International Airport

**For:**

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

Attn: Marcy Nadel



---

*Authorized for release by:  
8/3/2020 1:14:01 PM*

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*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Definitions/Glossary

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## Qualifiers

### LCMS

| Qualifier | Qualifier Description  |
|-----------|--|
| F1        | MS and/or MSD recovery exceeds control limits.   |
| I         | Value is EMPC (estimated maximum possible concentration).  |
| 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   |

# Case Narrative

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

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## Job ID: 320-63125-1

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### Laboratory: Eurofins TestAmerica, Sacramento

#### Narrative

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#### Job Narrative 320-63125-1

#### Receipt

The samples were received on 7/28/2020 11:15 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.0° C.

#### LCMS

Method 537 (modified): The matrix spike (MS) recovery for Perfluorooctanesulfonic acid (PFOS) and 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid in preparation batch 320-399186 and analytical batch 320-399992 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgement was used to positively identify the analyte in the following sample: 20FAI-LM-05 (320-63125-5).

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

#### General Chemistry

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

#### Organic Prep

Method SHAKE: The following samples: 20FAI-LM-01 (320-63125-1), 20FAI-LM-02 (320-63125-2), 20FAI-LM-03 (320-63125-3), 20FAI-LM-04 (320-63125-4), 20FAI-LM-05 (320-63125-5), (320-63125-A-1 MS) and (320-63125-A-1 MSD) were slightly yellow after final volume.

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

# Detection Summary

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## Client Sample ID: 20FAI-LM-01

## Lab Sample ID: 320-63125-1

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluoroundecanoic acid (PFUnA)     | 0.13   | J         | 0.22 | 0.040 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorohexanesulfonic acid (PFHxS) | 0.20   | J         | 0.22 | 0.034 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS)  | 0.82   | F1        | 0.55 | 0.22  | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

## Client Sample ID: 20FAI-LM-02

## Lab Sample ID: 320-63125-2

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluorodecanoic acid (PFDA)        | 0.027  | J         | 0.20 | 0.022 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorohexanesulfonic acid (PFHxS) | 0.033  | J         | 0.20 | 0.031 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS)  | 1.2    |           | 0.51 | 0.20  | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

## Client Sample ID: 20FAI-LM-03

## Lab Sample ID: 320-63125-3

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluorohexanesulfonic acid (PFHxS) | 0.056  | J         | 0.21 | 0.032 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS)  | 1.0    |           | 0.52 | 0.21  | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

## Client Sample ID: 20FAI-LM-04

## Lab Sample ID: 320-63125-4

| Analyte                             | Result | Qualifier | RL   | MDL  | Unit  | Dil Fac | D | Method         | Prep Type |
|-------------------------------------|--------|-----------|------|------|-------|---------|---|----------------|-----------|
| Perfluorooctanesulfonic acid (PFOS) | 0.25   | J         | 0.49 | 0.20 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

## Client Sample ID: 20FAI-LM-05

## Lab Sample ID: 320-63125-5

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluorohexanoic acid (PFHxA)       | 0.39   |           | 0.28 | 0.059 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorooctanoic acid (PFOA)        | 0.20   | J         | 0.28 | 0.12  | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorohexanesulfonic acid (PFHxS) | 1.1    | I         | 0.28 | 0.043 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS)  | 0.30   | J         | 0.70 | 0.28  | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

## Client Sample ID: 20FAI-LM-06

## Lab Sample ID: 320-63125-6

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluorohexanesulfonic acid (PFHxS) | 0.064  | J         | 0.22 | 0.033 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS)  | 0.30   | J         | 0.54 | 0.22  | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

## Client Sample ID: 20FAI-LM-07

## Lab Sample ID: 320-63125-7

No Detections.

## Client Sample ID: 20FAI-LM-08

## Lab Sample ID: 320-63125-8

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluorohexanesulfonic acid (PFHxS) | 0.033  | J         | 0.20 | 0.031 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

## Client Sample ID: 20FAI-LM-09

## Lab Sample ID: 320-63125-9

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluorohexanesulfonic acid (PFHxS) | 0.090  | J         | 0.20 | 0.031 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

## Client Sample ID: 20FAI-LM-10

## Lab Sample ID: 320-63125-10

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluorohexanesulfonic acid (PFHxS) | 0.081  | J         | 0.24 | 0.037 | ug/Kg | 1       | ☒ | 537 (modified) | Total/NA  |

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

# Detection Summary

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-88**

**Lab Sample ID: 320-63125-11**

| Analyte                              | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method         | Prep Type |
|--------------------------------------|--------|-----------|------|-------|-------|---------|---|----------------|-----------|
| Perfluorohexanesulfonic acid (PFHxS) | 0.034  | J         | 0.20 | 0.030 | ug/Kg | 1       | ☼ | 537 (modified) | Total/NA  |

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

# Client Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-01**

**Lab Sample ID: 320-63125-1**

**Date Collected: 07/23/20 15:26**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 89.3**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result      | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|-------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND          |           | 0.22 | 0.046 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND          |           | 0.22 | 0.032 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND          |           | 0.22 | 0.095 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND          |           | 0.22 | 0.040 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND          |           | 0.22 | 0.024 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| <b>Perfluoroundecanoic acid (PFUnA)</b>                  | <b>0.13</b> | <b>J</b>  | 0.22 | 0.040 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND          |           | 0.22 | 0.074 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND          |           | 0.22 | 0.056 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND          |           | 0.22 | 0.060 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND          |           | 0.22 | 0.028 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>              | <b>0.20</b> | <b>J</b>  | 0.22 | 0.034 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| <b>Perfluorooctanesulfonic acid (PFOS)</b>               | <b>0.82</b> | <b>F1</b> | 0.55 | 0.22  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND          |           | 2.2  | 0.43  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND          |           | 2.2  | 0.41  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND          |           | 0.22 | 0.030 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND          |           | 0.28 | 0.12  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid       | ND          | F1        | 0.22 | 0.024 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND          |           | 0.22 | 0.020 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:23 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 77        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C4 PFHpA       | 76        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C4 PFOA        | 76        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C5 PFNA        | 71        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C2 PFDA        | 69        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C2 PFUnA       | 67        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C2 PFDoA       | 72        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C2 PFTeDA      | 62        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C3 PFBS        | 68        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 18O2 PFHxS       | 72        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C4 PFOS        | 65        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| d3-NMeFOSAA      | 73        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| d5-NEtFOSAA      | 63        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |
| 13C3 HFPO-DA     | 69        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:23 | 1       |

# Client Sample Results

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-02**

**Lab Sample ID: 320-63125-2**

**Date Collected: 07/23/20 15:20**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 90.8**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result       | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|--------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND           |           | 0.20 | 0.043 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND           |           | 0.20 | 0.029 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND           |           | 0.20 | 0.087 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND           |           | 0.20 | 0.036 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| <b>Perfluorodecanoic acid (PFDA)</b>                     | <b>0.027</b> | <b>J</b>  | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND           |           | 0.20 | 0.036 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND           |           | 0.20 | 0.068 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND           |           | 0.20 | 0.052 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND           |           | 0.20 | 0.055 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND           |           | 0.20 | 0.025 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>              | <b>0.033</b> | <b>J</b>  | 0.20 | 0.031 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| <b>Perfluorooctanesulfonic acid (PFOS)</b>               | <b>1.2</b>   |           | 0.51 | 0.20  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND           |           | 2.0  | 0.40  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND           |           | 2.0  | 0.38  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND           |           | 0.20 | 0.027 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND           |           | 0.25 | 0.11  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid       | ND           |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND           |           | 0.20 | 0.018 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 20:52 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 87        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C4 PFHpA       | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C4 PFOA        | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C5 PFNA        | 93        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C2 PFDA        | 92        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C2 PFUnA       | 79        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C2 PFDoA       | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C2 PFTeDA      | 70        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C3 PFBS        | 83        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 18O2 PFHxS       | 88        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C4 PFOS        | 77        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| d3-NMeFOSAA      | 81        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| d5-NEtFOSAA      | 83        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |
| 13C3 HFPO-DA     | 80        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:52 | 1       |

Eurofins TestAmerica, Sacramento



# Client Sample Results

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-03**

**Lab Sample ID: 320-63125-3**

Date Collected: 07/23/20 15:45

Matrix: Solid

Date Received: 07/28/20 11:15

Percent Solids: 93.2

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte   | Result       | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---|--------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                          | ND           |           | 0.21 | 0.044 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluoroheptanoic acid (PFHpA)                         | ND           |           | 0.21 | 0.030 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluorooctanoic acid (PFOA)                           | ND           |           | 0.21 | 0.090 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluorononanoic acid (PFNA)                           | ND           |           | 0.21 | 0.037 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluorodecanoic acid (PFDA)                           | ND           |           | 0.21 | 0.023 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluoroundecanoic acid (PFUnA)                        | ND           |           | 0.21 | 0.037 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluorododecanoic acid (PFDoA)                        | ND           |           | 0.21 | 0.070 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluorotridecanoic acid (PFTriA)                      | ND           |           | 0.21 | 0.053 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                     | ND           |           | 0.21 | 0.056 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                     | ND           |           | 0.21 | 0.026 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>             | <b>0.056</b> | <b>J</b>  | 0.21 | 0.032 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| <b>Perfluorooctanesulfonic acid (PFOS)</b>              | <b>1.0</b>   |           | 0.52 | 0.21  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| N-methylperfluorooctanesulfonamidooctic acid (NMeFOSAA) | ND           |           | 2.1  | 0.41  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| N-ethylperfluorooctanesulfonamidooctic acid (NEtFOSAA)  | ND           |           | 2.1  | 0.39  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid      | ND           |           | 0.21 | 0.028 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)          | ND           |           | 0.26 | 0.11  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid      | ND           |           | 0.21 | 0.023 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)             | ND           |           | 0.21 | 0.019 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:01 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 90        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C4 PFHpA       | 85        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C4 PFOA        | 90        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C5 PFNA        | 91        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C2 PFDA        | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C2 PFUnA       | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C2 PFDoA       | 81        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C2 PFTeDA      | 74        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C3 PFBS        | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 18O2 PFHxS       | 83        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C4 PFOS        | 77        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| d3-NMeFOSAA      | 86        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| d5-NEtFOSAA      | 83        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |
| 13C3 HFPO-DA     | 80        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:01 | 1       |

Eurofins TestAmerica, Sacramento

# Client Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-04**

**Lab Sample ID: 320-63125-4**

**Date Collected: 07/23/20 15:54**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 94.1**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result      | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|-------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND          |           | 0.20 | 0.041 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND          |           | 0.20 | 0.029 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND          |           | 0.20 | 0.085 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND          |           | 0.20 | 0.036 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND          |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND          |           | 0.20 | 0.036 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND          |           | 0.20 | 0.066 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND          |           | 0.20 | 0.050 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND          |           | 0.20 | 0.053 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND          |           | 0.20 | 0.025 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Perfluorohexanesulfonic acid (PFHxS)                     | ND          |           | 0.20 | 0.031 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| <b>Perfluorooctanesulfonic acid (PFOS)</b>               | <b>0.25</b> | <b>J</b>  | 0.49 | 0.20  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND          |           | 2.0  | 0.39  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND          |           | 2.0  | 0.37  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND          |           | 0.20 | 0.027 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND          |           | 0.25 | 0.11  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid       | ND          |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND          |           | 0.20 | 0.018 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:10 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 96        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C4 PFHpA       | 90        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C4 PFOA        | 92        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C5 PFNA        | 93        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C2 PFDA        | 91        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C2 PFUnA       | 77        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C2 PFDoA       | 87        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C2 PFTeDA      | 79        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C3 PFBS        | 85        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 18O2 PFHxS       | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C4 PFOS        | 81        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| d3-NMeFOSAA      | 100       |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| d5-NEtFOSAA      | 92        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |
| 13C3 HFPO-DA     | 86        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:10 | 1       |

Eurofins TestAmerica, Sacramento

# Client Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-05**

**Lab Sample ID: 320-63125-5**

Date Collected: 07/23/20 16:22

Matrix: Solid

Date Received: 07/28/20 11:15

Percent Solids: 69.2

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result      | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|-------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| <b>Perfluorohexanoic acid (PFHxA)</b>                    | <b>0.39</b> |           | 0.28 | 0.059 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND          |           | 0.28 | 0.041 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| <b>Perfluorooctanoic acid (PFOA)</b>                     | <b>0.20</b> | <b>J</b>  | 0.28 | 0.12  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND          |           | 0.28 | 0.050 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND          |           | 0.28 | 0.031 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND          |           | 0.28 | 0.050 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND          |           | 0.28 | 0.094 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND          |           | 0.28 | 0.071 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND          |           | 0.28 | 0.076 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND          |           | 0.28 | 0.035 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>              | <b>1.1</b>  | <b>I</b>  | 0.28 | 0.043 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| <b>Perfluorooctanesulfonic acid (PFOS)</b>               | <b>0.30</b> | <b>J</b>  | 0.70 | 0.28  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND          |           | 2.8  | 0.55  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND          |           | 2.8  | 0.52  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND          |           | 0.28 | 0.038 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND          |           | 0.35 | 0.15  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid       | ND          |           | 0.28 | 0.031 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND          |           | 0.28 | 0.025 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:39 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 90        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C4 PFHpA       | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C4 PFOA        | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C5 PFNA        | 93        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C2 PFDA        | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C2 PFUnA       | 70        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C2 PFDoA       | 72        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C2 PFTeDA      | 64        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C3 PFBS        | 87        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 18O2 PFHxS       | 95        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C4 PFOS        | 90        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| d3-NMeFOSAA      | 72        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| d5-NEtFOSAA      | 71        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |
| 13C3 HFPO-DA     | 82        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:39 | 1       |

# Client Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-06**

**Lab Sample ID: 320-63125-6**

**Date Collected: 07/23/20 16:30**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 91.0**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result           | Qualifier        | RL            | MDL   | Unit  | D | Prepared        | Analyzed        | Dil Fac        |
|--|------------------|------------------|---------------|-------|-------|---|-----------------|-----------------|----------------|
| Perfluorohexanoic acid (PFHxA)                           | ND               |                  | 0.22          | 0.045 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluoroheptanoic acid (PFHpA)                          | ND               |                  | 0.22          | 0.031 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluorooctanoic acid (PFOA)                            | ND               |                  | 0.22          | 0.092 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluorononanoic acid (PFNA)                            | ND               |                  | 0.22          | 0.039 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluorodecanoic acid (PFDA)                            | ND               |                  | 0.22          | 0.024 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluoroundecanoic acid (PFUnA)                         | ND               |                  | 0.22          | 0.039 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluorododecanoic acid (PFDoA)                         | ND               |                  | 0.22          | 0.072 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluorotridecanoic acid (PFTriA)                       | ND               |                  | 0.22          | 0.055 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluorotetradecanoic acid (PFTeA)                      | ND               |                  | 0.22          | 0.058 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Perfluorobutanesulfonic acid (PFBS)                      | ND               |                  | 0.22          | 0.027 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>              | <b>0.064</b>     | <b>J</b>         | 0.22          | 0.033 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| <b>Perfluorooctanesulfonic acid (PFOS)</b>               | <b>0.30</b>      | <b>J</b>         | 0.54          | 0.22  | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND               |                  | 2.2           | 0.42  | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND               |                  | 2.2           | 0.40  | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND               |                  | 0.22          | 0.029 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND               |                  | 0.27          | 0.12  | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid       | ND               |                  | 0.22          | 0.024 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND               |                  | 0.22          | 0.019 | ug/Kg | ☼ | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| <i>Isotope Dilution</i>                                  | <i>%Recovery</i> | <i>Qualifier</i> | <i>Limits</i> |       |       |   | <i>Prepared</i> | <i>Analyzed</i> | <i>Dil Fac</i> |
| 13C2 PFHxA   | 101              |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C4 PFHpA   | 91               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C4 PFOA  | 93               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C5 PFNA  | 98               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C2 PFDA  | 92               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C2 PFUnA   | 83               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C2 PFDoA   | 86               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C2 PFTeDA  | 81               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C3 PFBS  | 86               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 18O2 PFHxS   | 92               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C4 PFOS  | 88               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| d3-NMeFOSAA  | 99               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| d5-NEtFOSAA  | 95               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |
| 13C3 HFPO-DA   | 87               |                  | 25 - 150      |       |       |   | 07/28/20 18:39  | 07/30/20 21:48  | 1              |

# Client Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-07**

**Lab Sample ID: 320-63125-7**

**Date Collected: 07/23/20 16:36**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 91.0**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND     |           | 0.20 | 0.043 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND     |           | 0.20 | 0.030 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND     |           | 0.20 | 0.088 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND     |           | 0.20 | 0.037 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND     |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND     |           | 0.20 | 0.037 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND     |           | 0.20 | 0.068 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND     |           | 0.20 | 0.052 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND     |           | 0.20 | 0.055 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND     |           | 0.20 | 0.026 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorohexanesulfonic acid (PFHxS)                     | ND     |           | 0.20 | 0.032 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Perfluorooctanesulfonic acid (PFOS)                      | ND     |           | 0.51 | 0.20  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND     |           | 2.0  | 0.40  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND     |           | 2.0  | 0.38  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND     |           | 0.20 | 0.028 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND     |           | 0.26 | 0.11  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid      | ND     |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND     |           | 0.20 | 0.018 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 21:57 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 86        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C4 PFHpA       | 78        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C4 PFOA        | 81        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C5 PFNA        | 86        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C2 PFDA        | 77        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C2 PFUnA       | 72        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C2 PFDoA       | 80        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C2 PFTeDA      | 67        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C3 PFBS        | 77        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 18O2 PFHxS       | 83        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C4 PFOS        | 75        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| d3-NMeFOSAA      | 85        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| d5-NEtFOSAA      | 82        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |
| 13C3 HFPO-DA     | 74        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 21:57 | 1       |

# Client Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-08**

**Lab Sample ID: 320-63125-8**

**Date Collected: 07/24/20 12:34**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 92.5**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result       | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|--------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND           |           | 0.20 | 0.043 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND           |           | 0.20 | 0.029 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND           |           | 0.20 | 0.087 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND           |           | 0.20 | 0.037 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND           |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND           |           | 0.20 | 0.037 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND           |           | 0.20 | 0.068 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND           |           | 0.20 | 0.052 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND           |           | 0.20 | 0.055 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND           |           | 0.20 | 0.025 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>              | <b>0.033</b> | <b>J</b>  | 0.20 | 0.031 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Perfluorooctanesulfonic acid (PFOS)                      | ND           |           | 0.51 | 0.20  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND           |           | 2.0  | 0.40  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND           |           | 2.0  | 0.38  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND           |           | 0.20 | 0.027 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND           |           | 0.25 | 0.11  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 11-Chloroeicosadecafluoro-3-oxaundecane-1-sulfonic acid  | ND           |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND           |           | 0.20 | 0.018 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:07 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 100       |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C4 PFHpA       | 93        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C4 PFOA        | 96        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C5 PFNA        | 94        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C2 PFDA        | 95        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C2 PFUnA       | 92        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C2 PFDoA       | 96        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C2 PFTeDA      | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C3 PFBS        | 88        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 18O2 PFHxS       | 98        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C4 PFOS        | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| d3-NMeFOSAA      | 100       |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| d5-NEtFOSAA      | 95        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |
| 13C3 HFPO-DA     | 92        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:07 | 1       |

# Client Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-09**

**Lab Sample ID: 320-63125-9**

**Date Collected: 07/24/20 12:45**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 91.8**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result       | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|--------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND           |           | 0.20 | 0.042 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND           |           | 0.20 | 0.029 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND           |           | 0.20 | 0.086 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND           |           | 0.20 | 0.036 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND           |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND           |           | 0.20 | 0.036 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND           |           | 0.20 | 0.067 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND           |           | 0.20 | 0.051 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND           |           | 0.20 | 0.054 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND           |           | 0.20 | 0.025 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>              | <b>0.090</b> | <b>J</b>  | 0.20 | 0.031 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Perfluorooctanesulfonic acid (PFOS)                      | ND           |           | 0.50 | 0.20  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND           |           | 2.0  | 0.39  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND           |           | 2.0  | 0.37  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND           |           | 0.20 | 0.027 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND           |           | 0.25 | 0.11  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid       | ND           |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND           |           | 0.20 | 0.018 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:16 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 88        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C4 PFHpA       | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C4 PFOA        | 88        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C5 PFNA        | 91        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C2 PFDA        | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C2 PFUnA       | 85        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C2 PFDoA       | 87        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C2 PFTeDA      | 76        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C3 PFBS        | 82        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 18O2 PFHxS       | 88        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C4 PFOS        | 77        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| d3-NMeFOSAA      | 99        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| d5-NEtFOSAA      | 87        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |
| 13C3 HFPO-DA     | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:16 | 1       |

# Client Sample Results

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-10**

**Lab Sample ID: 320-63125-10**

**Date Collected: 07/24/20 12:32**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 76.7**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result       | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|--------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND           |           | 0.24 | 0.050 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND           |           | 0.24 | 0.035 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND           |           | 0.24 | 0.10  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND           |           | 0.24 | 0.043 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND           |           | 0.24 | 0.026 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND           |           | 0.24 | 0.043 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND           |           | 0.24 | 0.080 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND           |           | 0.24 | 0.061 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND           |           | 0.24 | 0.065 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND           |           | 0.24 | 0.030 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>              | <b>0.081</b> | <b>J</b>  | 0.24 | 0.037 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Perfluorooctanesulfonic acid (PFOS)                      | ND           |           | 0.60 | 0.24  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND           |           | 2.4  | 0.47  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND           |           | 2.4  | 0.44  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND           |           | 0.24 | 0.032 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND           |           | 0.30 | 0.13  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid      | ND           |           | 0.24 | 0.026 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND           |           | 0.24 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:26 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C4 PFHpA       | 83        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C4 PFOA        | 82        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C5 PFNA        | 94        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C2 PFDA        | 86        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C2 PFUnA       | 82        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C2 PFDoA       | 77        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C2 PFTeDA      | 71        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C3 PFBS        | 85        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 18O2 PFHxS       | 86        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C4 PFOS        | 82        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| d3-NMeFOSAA      | 98        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| d5-NEtFOSAA      | 88        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |
| 13C3 HFPO-DA     | 82        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:26 | 1       |



# Client Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-88**

**Lab Sample ID: 320-63125-11**

**Date Collected: 07/24/20 12:24**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 94.4**

**Method: 537 (modified) - Fluorinated Alkyl Substances**

| Analyte  | Result       | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|--------------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND           |           | 0.20 | 0.041 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND           |           | 0.20 | 0.029 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND           |           | 0.20 | 0.085 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND           |           | 0.20 | 0.035 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND           |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND           |           | 0.20 | 0.035 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND           |           | 0.20 | 0.066 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND           |           | 0.20 | 0.050 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND           |           | 0.20 | 0.053 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND           |           | 0.20 | 0.025 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| <b>Perfluorohexanesulfonic acid (PFHxS)</b>              | <b>0.034</b> | <b>J</b>  | 0.20 | 0.030 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Perfluorooctanesulfonic acid (PFOS)                      | ND           |           | 0.49 | 0.20  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND           |           | 2.0  | 0.38  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND           |           | 2.0  | 0.36  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND           |           | 0.20 | 0.027 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND           |           | 0.25 | 0.11  | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid       | ND           |           | 0.20 | 0.022 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND           |           | 0.20 | 0.018 | ug/Kg | ☼ | 07/28/20 18:39 | 07/30/20 22:35 | 1       |

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 90        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C4 PFHpA       | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C4 PFOA        | 90        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C5 PFNA        | 91        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C2 PFDA        | 88        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C2 PFUnA       | 86        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C2 PFDoA       | 86        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C2 PFTeDA      | 87        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C3 PFBS        | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 18O2 PFHxS       | 87        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C4 PFOS        | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| d3-NMeFOSAA      | 89        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| d5-NEtFOSAA      | 88        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |
| 13C3 HFPO-DA     | 84        |           | 25 - 150 | 07/28/20 18:39 | 07/30/20 22:35 | 1       |

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# Isotope Dilution Summary

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

| Lab Sample ID      | Client Sample ID   | PFHxA<br>(25-150) | C4PFHA<br>(25-150) | PFOA<br>(25-150) | PFNA<br>(25-150) | PFDA<br>(25-150) | PFUnA<br>(25-150) | PFDoA<br>(25-150) | PFTDA<br>(25-150) |
|--------------------|--------------------|-------------------|--------------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|
| 320-63125-1        | 20FAI-LM-01        | 77                | 76                 | 76               | 71               | 69               | 67                | 72                | 62                |
| 320-63125-1 MS     | 20FAI-LM-01        | 95                | 89                 | 90               | 89               | 87               | 85                | 81                | 75                |
| 320-63125-1 MSD    | 20FAI-LM-01        | 99                | 95                 | 96               | 95               | 95               | 87                | 88                | 79                |
| 320-63125-2        | 20FAI-LM-02        | 87                | 89                 | 89               | 93               | 92               | 79                | 84                | 70                |
| 320-63125-3        | 20FAI-LM-03        | 90                | 85                 | 90               | 91               | 84               | 84                | 81                | 74                |
| 320-63125-4        | 20FAI-LM-04        | 96                | 90                 | 92               | 93               | 91               | 77                | 87                | 79                |
| 320-63125-5        | 20FAI-LM-05        | 90                | 84                 | 89               | 93               | 84               | 70                | 72                | 64                |
| 320-63125-6        | 20FAI-LM-06        | 101               | 91                 | 93               | 98               | 92               | 83                | 86                | 81                |
| 320-63125-7        | 20FAI-LM-07        | 86                | 78                 | 81               | 86               | 77               | 72                | 80                | 67                |
| 320-63125-8        | 20FAI-LM-08        | 100               | 93                 | 96               | 94               | 95               | 92                | 96                | 84                |
| 320-63125-9        | 20FAI-LM-09        | 88                | 89                 | 88               | 91               | 89               | 85                | 87                | 76                |
| 320-63125-10       | 20FAI-LM-10        | 89                | 83                 | 82               | 94               | 86               | 82                | 77                | 71                |
| 320-63125-11       | 20FAI-LM-88        | 90                | 89                 | 90               | 91               | 88               | 86                | 86                | 87                |
| LCS 320-399186/2-A | Lab Control Sample | 81                | 80                 | 81               | 82               | 78               | 72                | 75                | 77                |
| MB 320-399186/1-A  | Method Blank       | 105               | 101                | 101              | 101              | 99               | 97                | 98                | 96                |

### Percent Isotope Dilution Recovery (Acceptance Limits)

| Lab Sample ID      | Client Sample ID   | C3PFBS<br>(25-150) | PFHxS<br>(25-150) | PFOS<br>(25-150) | d3NMFOS<br>(25-150) | d5NEFOS<br>(25-150) | HFPODA<br>(25-150) |
|--------------------|--------------------|--------------------|-------------------|------------------|---------------------|---------------------|--------------------|
| 320-63125-1        | 20FAI-LM-01        | 68                 | 72                | 65               | 73                  | 63                  | 69                 |
| 320-63125-1 MS     | 20FAI-LM-01        | 87                 | 90                | 79               | 40                  | 36                  | 85                 |
| 320-63125-1 MSD    | 20FAI-LM-01        | 91                 | 91                | 86               | 90                  | 87                  | 90                 |
| 320-63125-2        | 20FAI-LM-02        | 83                 | 88                | 77               | 81                  | 83                  | 80                 |
| 320-63125-3        | 20FAI-LM-03        | 84                 | 83                | 77               | 86                  | 83                  | 80                 |
| 320-63125-4        | 20FAI-LM-04        | 85                 | 84                | 81               | 100                 | 92                  | 86                 |
| 320-63125-5        | 20FAI-LM-05        | 87                 | 95                | 90               | 72                  | 71                  | 82                 |
| 320-63125-6        | 20FAI-LM-06        | 86                 | 92                | 88               | 99                  | 95                  | 87                 |
| 320-63125-7        | 20FAI-LM-07        | 77                 | 83                | 75               | 85                  | 82                  | 74                 |
| 320-63125-8        | 20FAI-LM-08        | 88                 | 98                | 89               | 100                 | 95                  | 92                 |
| 320-63125-9        | 20FAI-LM-09        | 82                 | 88                | 77               | 99                  | 87                  | 84                 |
| 320-63125-10       | 20FAI-LM-10        | 85                 | 86                | 82               | 98                  | 88                  | 82                 |
| 320-63125-11       | 20FAI-LM-88        | 84                 | 87                | 84               | 89                  | 88                  | 84                 |
| LCS 320-399186/2-A | Lab Control Sample | 73                 | 79                | 77               | 80                  | 71                  | 75                 |
| MB 320-399186/1-A  | Method Blank       | 94                 | 97                | 95               | 101                 | 102                 | 96                 |

#### Surrogate Legend

- PFHxA = 13C2 PFHxA
- C4PFHA = 13C4 PFHpA
- PFOA = 13C4 PFOA
- PFNA = 13C5 PFNA
- PFDA = 13C2 PFDA
- PFUnA = 13C2 PFUnA
- PFDoA = 13C2 PFDoA
- PFTDA = 13C2 PFTeDA
- C3PFBS = 13C3 PFBS
- PFHxS = 18O2 PFHxS
- PFOS = 13C4 PFOS
- d3NMFOS = d3-NMeFOSAA
- d5NEFOS = d5-NEtFOSAA
- HFPODA = 13C3 HFPO-DA

# QC Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## Method: 537 (modified) - Fluorinated Alkyl Substances

**Lab Sample ID: MB 320-399186/1-A**  
**Matrix: Solid**  
**Analysis Batch: 399992**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 399186**

| Analyte  | MB Result | MB Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|--|-----------|--------------|------|-------|-------|---|----------------|----------------|---------|
| Perfluorohexanoic acid (PFHxA)                           | ND        |              | 0.20 | 0.042 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluoroheptanoic acid (PFHpA)                          | ND        |              | 0.20 | 0.029 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorooctanoic acid (PFOA)                            | ND        |              | 0.20 | 0.086 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorononanoic acid (PFNA)                            | ND        |              | 0.20 | 0.036 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorodecanoic acid (PFDA)                            | ND        |              | 0.20 | 0.022 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluoroundecanoic acid (PFUnA)                         | ND        |              | 0.20 | 0.036 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorododecanoic acid (PFDoA)                         | ND        |              | 0.20 | 0.067 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorotridecanoic acid (PFTriA)                       | ND        |              | 0.20 | 0.051 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorotetradecanoic acid (PFTeA)                      | ND        |              | 0.20 | 0.054 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorobutanesulfonic acid (PFBS)                      | ND        |              | 0.20 | 0.025 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorohexanesulfonic acid (PFHxS)                     | ND        |              | 0.20 | 0.031 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Perfluorooctanesulfonic acid (PFOS)                      | ND        |              | 0.50 | 0.20  | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) | ND        |              | 2.0  | 0.39  | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)  | ND        |              | 2.0  | 0.37  | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid       | ND        |              | 0.20 | 0.027 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)           | ND        |              | 0.25 | 0.11  | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid      | ND        |              | 0.20 | 0.022 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)              | ND        |              | 0.20 | 0.018 | ug/Kg |   | 07/28/20 18:39 | 07/30/20 20:05 | 1       |

| Isotope Dilution | MB %Recovery | MB Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|--------------|--------------|----------|----------------|----------------|---------|
| 13C2 PFHxA       | 105          |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C4 PFHpA       | 101          |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C4 PFOA        | 101          |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C5 PFNA        | 101          |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C2 PFDA        | 99           |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C2 PFUnA       | 97           |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C2 PFDoA       | 98           |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C2 PFTeDA      | 96           |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C3 PFBS        | 94           |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 18O2 PFHxS       | 97           |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C4 PFOS        | 95           |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| d3-NMeFOSAA      | 101          |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| d5-NEtFOSAA      | 102          |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |
| 13C3 HFPO-DA     | 96           |              | 25 - 150 | 07/28/20 18:39 | 07/30/20 20:05 | 1       |

**Lab Sample ID: LCS 320-399186/2-A**  
**Matrix: Solid**  
**Analysis Batch: 399992**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 399186**

| Analyte                         | Spike Added | LCS Result | LCS Qualifier | Unit  | D | %Rec | Limits   |
|---------------------------------|-------------|------------|---------------|-------|---|------|----------|
| Perfluorohexanoic acid (PFHxA)  | 2.00        | 2.08       |               | ug/Kg |   | 104  | 71 - 131 |
| Perfluoroheptanoic acid (PFHpA) | 2.00        | 2.12       |               | ug/Kg |   | 106  | 71 - 131 |
| Perfluorooctanoic acid (PFOA)   | 2.00        | 2.07       |               | ug/Kg |   | 103  | 72 - 132 |
| Perfluorononanoic acid (PFNA)   | 2.00        | 2.17       |               | ug/Kg |   | 108  | 73 - 133 |

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# QC Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

**Lab Sample ID: LCS 320-399186/2-A**  
**Matrix: Solid**  
**Analysis Batch: 399992**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 399186**

| Analyte  | Spike Added | LCS Result | LCS Qualifier | Unit  | D | %Rec | %Rec. Limits |
|--|-------------|------------|---------------|-------|---|------|--------------|
| Perfluorodecanoic acid (PFDA)                      | 2.00        | 2.13       |               | ug/Kg |   | 107  | 72 - 132     |
| Perfluoroundecanoic acid (PFUnA)                   | 2.00        | 2.24       |               | ug/Kg |   | 112  | 66 - 126     |
| Perfluorododecanoic acid (PFDoA)                   | 2.01        | 2.16       |               | ug/Kg |   | 107  | 71 - 131     |
| Perfluorotridecanoic acid (PFTriA)                 | 2.00        | 2.23       |               | ug/Kg |   | 111  | 71 - 131     |
| Perfluorotetradecanoic acid (PFTeA)                | 2.00        | 2.15       |               | ug/Kg |   | 108  | 67 - 127     |
| Perfluorobutanesulfonic acid (PFBS)                | 1.77        | 1.95       |               | ug/Kg |   | 110  | 69 - 129     |
| Perfluorohexanesulfonic acid (PFHxS)               | 1.82        | 1.88       |               | ug/Kg |   | 103  | 62 - 122     |
| Perfluorooctanesulfonic acid (PFOS)                | 1.86        | 2.15       |               | ug/Kg |   | 116  | 68 - 141     |
| 9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid   | 1.86        | 1.96       |               | ug/Kg |   | 105  | 74 - 134     |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)     | 2.00        | 2.23       |               | ug/Kg |   | 111  | 53 - 158     |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid | 1.88        | 2.25       |               | ug/Kg |   | 119  | 66 - 136     |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)        | 1.88        | 2.35       |               | ug/Kg |   | 125  | 79 - 139     |

| Isotope Dilution         | LCS %Recovery | LCS Qualifier | Limits   |
|--------------------------|---------------|---------------|----------|
| <sup>13</sup> C2 PFHxA   | 81            |               | 25 - 150 |
| <sup>13</sup> C4 PFHpA   | 80            |               | 25 - 150 |
| <sup>13</sup> C4 PFOA    | 81            |               | 25 - 150 |
| <sup>13</sup> C5 PFNA    | 82            |               | 25 - 150 |
| <sup>13</sup> C2 PFDA    | 78            |               | 25 - 150 |
| <sup>13</sup> C2 PFUnA   | 72            |               | 25 - 150 |
| <sup>13</sup> C2 PFDoA   | 75            |               | 25 - 150 |
| <sup>13</sup> C2 PFTeDA  | 77            |               | 25 - 150 |
| <sup>13</sup> C3 PFBS    | 73            |               | 25 - 150 |
| <sup>18</sup> O2 PFHxS   | 79            |               | 25 - 150 |
| <sup>13</sup> C4 PFOS    | 77            |               | 25 - 150 |
| d3-NMeFOSAA              | 80            |               | 25 - 150 |
| d5-NEtFOSAA              | 71            |               | 25 - 150 |
| <sup>13</sup> C3 HFPO-DA | 75            |               | 25 - 150 |

**Lab Sample ID: 320-63125-1 MS**  
**Matrix: Solid**  
**Analysis Batch: 399992**

**Client Sample ID: 20FAI-LM-01**  
**Prep Type: Total/NA**  
**Prep Batch: 399186**

| Analyte                          | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit  | D | %Rec | %Rec. Limits |
|----------------------------------|---------------|------------------|-------------|-----------|--------------|-------|---|------|--------------|
| Perfluorohexanoic acid (PFHxA)   | ND            |                  | 2.07        | 2.35      |              | ug/Kg | ☼ | 114  | 71 - 131     |
| Perfluoroheptanoic acid (PFHpA)  | ND            |                  | 2.07        | 2.32      |              | ug/Kg | ☼ | 112  | 71 - 131     |
| Perfluorooctanoic acid (PFOA)    | ND            |                  | 2.07        | 2.14      |              | ug/Kg | ☼ | 103  | 72 - 132     |
| Perfluorononanoic acid (PFNA)    | ND            |                  | 2.07        | 2.30      |              | ug/Kg | ☼ | 111  | 73 - 133     |
| Perfluorodecanoic acid (PFDA)    | ND            |                  | 2.07        | 2.15      |              | ug/Kg | ☼ | 104  | 72 - 132     |
| Perfluoroundecanoic acid (PFUnA) | 0.13          | J                | 2.07        | 2.57      |              | ug/Kg | ☼ | 118  | 66 - 126     |

Eurofins TestAmerica, Sacramento

# QC Sample Results

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

**Lab Sample ID: 320-63125-1 MS**

**Matrix: Solid**

**Analysis Batch: 399992**

**Client Sample ID: 20FAI-LM-01**

**Prep Type: Total/NA**

**Prep Batch: 399186**

| Analyte  | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit  | D | %Rec | %Rec. Limits |
|--|---------------|------------------|-------------|-----------|--------------|-------|---|------|--------------|
| Perfluorododecanoic acid (PFDoA)                   | ND            |                  | 2.08        | 2.23      |              | ug/Kg | ☼ | 107  | 71 - 131     |
| Perfluorotridecanoic acid (PFTriA)                 | ND            |                  | 2.07        | 2.40      |              | ug/Kg | ☼ | 116  | 71 - 131     |
| Perfluorotetradecanoic acid (PFTeA)                | ND            |                  | 2.07        | 2.16      |              | ug/Kg | ☼ | 104  | 67 - 127     |
| Perfluorobutanesulfonic acid (PFBS)                | ND            |                  | 1.83        | 2.03      |              | ug/Kg | ☼ | 111  | 69 - 129     |
| Perfluorohexanesulfonic acid (PFHxS)               | 0.20          | J                | 1.88        | 2.16      |              | ug/Kg | ☼ | 104  | 62 - 122     |
| Perfluorooctanesulfonic acid (PFOS)                | 0.82          | F1               | 1.92        | 4.00      | F1           | ug/Kg | ☼ | 166  | 68 - 141     |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid | ND            |                  | 1.93        | 2.57      |              | ug/Kg | ☼ | 133  | 74 - 134     |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)     | ND            |                  | 2.07        | 2.31      |              | ug/Kg | ☼ | 112  | 53 - 158     |
| 11-Chloroeicosafuoro-3-oxaundecane-1-sulfonic acid | ND            | F1               | 1.95        | 2.70      | F1           | ug/Kg | ☼ | 138  | 66 - 136     |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)        | ND            |                  | 1.95        | 2.42      |              | ug/Kg | ☼ | 124  | 79 - 139     |

| Isotope Dilution | MS %Recovery | MS Qualifier | MS Limits |
|------------------|--------------|--------------|-----------|
| 13C2 PFHxA       | 95           |              | 25 - 150  |
| 13C4 PFHpA       | 89           |              | 25 - 150  |
| 13C4 PFOA        | 90           |              | 25 - 150  |
| 13C5 PFNA        | 89           |              | 25 - 150  |
| 13C2 PFDA        | 87           |              | 25 - 150  |
| 13C2 PFUnA       | 85           |              | 25 - 150  |
| 13C2 PFDoA       | 81           |              | 25 - 150  |
| 13C2 PFTeDA      | 75           |              | 25 - 150  |
| 13C3 PFBS        | 87           |              | 25 - 150  |
| 18O2 PFHxS       | 90           |              | 25 - 150  |
| 13C4 PFOS        | 79           |              | 25 - 150  |
| d3-NMeFOSAA      | 40           |              | 25 - 150  |
| d5-NEtFOSAA      | 36           |              | 25 - 150  |
| 13C3 HFPO-DA     | 85           |              | 25 - 150  |

**Lab Sample ID: 320-63125-1 MSD**

**Matrix: Solid**

**Analysis Batch: 399992**

**Client Sample ID: 20FAI-LM-01**

**Prep Type: Total/NA**

**Prep Batch: 399186**

| Analyte                          | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit  | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|----------------------------------|---------------|------------------|-------------|------------|---------------|-------|---|------|--------------|-----|-----------|
| Perfluorohexanoic acid (PFHxA)   | ND            |                  | 2.16        | 2.28       |               | ug/Kg | ☼ | 106  | 71 - 131     | 3   | 30        |
| Perfluoroheptanoic acid (PFHpA)  | ND            |                  | 2.16        | 2.40       |               | ug/Kg | ☼ | 111  | 71 - 131     | 4   | 30        |
| Perfluorooctanoic acid (PFOA)    | ND            |                  | 2.17        | 2.18       |               | ug/Kg | ☼ | 101  | 72 - 132     | 2   | 30        |
| Perfluorononanoic acid (PFNA)    | ND            |                  | 2.17        | 2.39       |               | ug/Kg | ☼ | 110  | 73 - 133     | 4   | 30        |
| Perfluorodecanoic acid (PFDA)    | ND            |                  | 2.16        | 2.31       |               | ug/Kg | ☼ | 107  | 72 - 132     | 7   | 30        |
| Perfluoroundecanoic acid (PFUnA) | 0.13          | J                | 2.17        | 2.65       |               | ug/Kg | ☼ | 116  | 66 - 126     | 3   | 30        |
| Perfluorododecanoic acid (PFDoA) | ND            |                  | 2.18        | 2.22       |               | ug/Kg | ☼ | 102  | 71 - 131     | 0   | 30        |

Eurofins TestAmerica, Sacramento

# QC Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

**Lab Sample ID: 320-63125-1 MSD**

**Matrix: Solid**

**Analysis Batch: 399992**

**Client Sample ID: 20FAI-LM-01**

**Prep Type: Total/NA**

**Prep Batch: 399186**

| Analyte   | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit  | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---------------|------------------|-------------|------------|---------------|-------|---|------|--------------|-----|-----------|
| Perfluorotridecanoic acid (PFTriA)                  | ND            |                  | 2.16        | 2.18       |               | ug/Kg | ☼ | 101  | 71 - 131     | 10  | 30        |
| Perfluorotetradecanoic acid (PFTeA)                 | ND            |                  | 2.17        | 2.18       |               | ug/Kg | ☼ | 101  | 67 - 127     | 1   | 30        |
| Perfluorobutanesulfonic acid (PFBS)                 | ND            |                  | 1.91        | 2.00       |               | ug/Kg | ☼ | 105  | 69 - 129     | 2   | 30        |
| Perfluorohexanesulfonic acid (PFHxS)                | 0.20          | J                | 1.97        | 2.55       |               | ug/Kg | ☼ | 119  | 62 - 122     | 16  | 30        |
| Perfluorooctanesulfonic acid (PFOS)                 | 0.82          | F1               | 2.01        | 3.07       |               | ug/Kg | ☼ | 112  | 68 - 141     | 26  | 30        |
| 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid  | ND            |                  | 2.02        | 2.34       |               | ug/Kg | ☼ | 116  | 74 - 134     | 10  | 30        |
| Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)      | ND            |                  | 2.16        | 2.39       |               | ug/Kg | ☼ | 111  | 53 - 158     | 3   | 30        |
| 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid | ND            | F1               | 2.04        | 2.71       |               | ug/Kg | ☼ | 133  | 66 - 136     | 0   | 30        |
| 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)         | ND            |                  | 2.04        | 2.47       |               | ug/Kg | ☼ | 121  | 79 - 139     | 2   | 30        |

| Isotope Dilution | MSD %Recovery | MSD Qualifier | Limits   |
|------------------|---------------|---------------|----------|
| 13C2 PFHxA       | 99            |               | 25 - 150 |
| 13C4 PFHpA       | 95            |               | 25 - 150 |
| 13C4 PFOA        | 96            |               | 25 - 150 |
| 13C5 PFNA        | 95            |               | 25 - 150 |
| 13C2 PFDA        | 95            |               | 25 - 150 |
| 13C2 PFUnA       | 87            |               | 25 - 150 |
| 13C2 PFDoA       | 88            |               | 25 - 150 |
| 13C2 PFTeDA      | 79            |               | 25 - 150 |
| 13C3 PFBS        | 91            |               | 25 - 150 |
| 18O2 PFHxS       | 91            |               | 25 - 150 |
| 13C4 PFOS        | 86            |               | 25 - 150 |
| d3-NMeFOSAA      | 90            |               | 25 - 150 |
| d5-NEtFOSAA      | 87            |               | 25 - 150 |
| 13C3 HFPO-DA     | 90            |               | 25 - 150 |

# QC Association Summary

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## LCMS

### Prep Batch: 399186

| Lab Sample ID      | Client Sample ID   | Prep Type | Matrix | Method | Prep Batch |
|--------------------|--------------------|-----------|--------|--------|------------|
| 320-63125-1        | 20FAI-LM-01        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-2        | 20FAI-LM-02        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-3        | 20FAI-LM-03        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-4        | 20FAI-LM-04        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-5        | 20FAI-LM-05        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-6        | 20FAI-LM-06        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-7        | 20FAI-LM-07        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-8        | 20FAI-LM-08        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-9        | 20FAI-LM-09        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-10       | 20FAI-LM-10        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-11       | 20FAI-LM-88        | Total/NA  | Solid  | SHAKE  |            |
| MB 320-399186/1-A  | Method Blank       | Total/NA  | Solid  | SHAKE  |            |
| LCS 320-399186/2-A | Lab Control Sample | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-1 MS     | 20FAI-LM-01        | Total/NA  | Solid  | SHAKE  |            |
| 320-63125-1 MSD    | 20FAI-LM-01        | Total/NA  | Solid  | SHAKE  |            |

### Analysis Batch: 399992

| Lab Sample ID      | Client Sample ID   | Prep Type | Matrix | Method         | Prep Batch |
|--------------------|--------------------|-----------|--------|----------------|------------|
| 320-63125-1        | 20FAI-LM-01        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-2        | 20FAI-LM-02        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-3        | 20FAI-LM-03        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-4        | 20FAI-LM-04        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-5        | 20FAI-LM-05        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-6        | 20FAI-LM-06        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-7        | 20FAI-LM-07        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-8        | 20FAI-LM-08        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-9        | 20FAI-LM-09        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-10       | 20FAI-LM-10        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-11       | 20FAI-LM-88        | Total/NA  | Solid  | 537 (modified) | 399186     |
| MB 320-399186/1-A  | Method Blank       | Total/NA  | Solid  | 537 (modified) | 399186     |
| LCS 320-399186/2-A | Lab Control Sample | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-1 MS     | 20FAI-LM-01        | Total/NA  | Solid  | 537 (modified) | 399186     |
| 320-63125-1 MSD    | 20FAI-LM-01        | Total/NA  | Solid  | 537 (modified) | 399186     |

## General Chemistry

### Analysis Batch: 399182

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------|------------------|-----------|--------|--------|------------|
| 320-63125-1   | 20FAI-LM-01      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-2   | 20FAI-LM-02      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-3   | 20FAI-LM-03      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-4   | 20FAI-LM-04      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-5   | 20FAI-LM-05      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-6   | 20FAI-LM-06      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-7   | 20FAI-LM-07      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-8   | 20FAI-LM-08      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-9   | 20FAI-LM-09      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-10  | 20FAI-LM-10      | Total/NA  | Solid  | D 2216 |            |
| 320-63125-11  | 20FAI-LM-88      | Total/NA  | Solid  | D 2216 |            |

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# Lab Chronicle

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-01**

**Date Collected: 07/23/20 15:26**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-1**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

**Client Sample ID: 20FAI-LM-01**

**Date Collected: 07/23/20 15:26**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-1**

**Matrix: Solid**

**Percent Solids: 89.3**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.07 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 20:23       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-02**

**Date Collected: 07/23/20 15:20**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-2**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

**Client Sample ID: 20FAI-LM-02**

**Date Collected: 07/23/20 15:20**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-2**

**Matrix: Solid**

**Percent Solids: 90.8**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.43 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 20:52       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-03**

**Date Collected: 07/23/20 15:45**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-3**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

**Client Sample ID: 20FAI-LM-03**

**Date Collected: 07/23/20 15:45**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-3**

**Matrix: Solid**

**Percent Solids: 93.2**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.15 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 21:01       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-04**

**Date Collected: 07/23/20 15:54**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-4**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

Eurofins TestAmerica, Sacramento



# Lab Chronicle

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-04**

**Date Collected: 07/23/20 15:54**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-4**

**Matrix: Solid**

**Percent Solids: 94.1**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.38 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 21:10       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-05**

**Date Collected: 07/23/20 16:22**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-5**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

**Client Sample ID: 20FAI-LM-05**

**Date Collected: 07/23/20 16:22**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-5**

**Matrix: Solid**

**Percent Solids: 69.2**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.16 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 21:39       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-06**

**Date Collected: 07/23/20 16:30**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-6**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

**Client Sample ID: 20FAI-LM-06**

**Date Collected: 07/23/20 16:30**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-6**

**Matrix: Solid**

**Percent Solids: 91.0**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.11 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 21:48       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-07**

**Date Collected: 07/23/20 16:36**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-7**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

# Lab Chronicle

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-07**

**Date Collected: 07/23/20 16:36**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-7**

**Matrix: Solid**

**Percent Solids: 91.0**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.38 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 21:57       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-08**

**Date Collected: 07/24/20 12:34**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-8**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

**Client Sample ID: 20FAI-LM-08**

**Date Collected: 07/24/20 12:34**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-8**

**Matrix: Solid**

**Percent Solids: 92.5**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.33 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 22:07       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-09**

**Date Collected: 07/24/20 12:45**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-9**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

**Client Sample ID: 20FAI-LM-09**

**Date Collected: 07/24/20 12:45**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-9**

**Matrix: Solid**

**Percent Solids: 91.8**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.47 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 22:16       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-10**

**Date Collected: 07/24/20 12:32**

**Date Received: 07/28/20 11:15**

**Lab Sample ID: 320-63125-10**

**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

# Lab Chronicle

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

**Client Sample ID: 20FAI-LM-10**

**Lab Sample ID: 320-63125-10**

**Date Collected: 07/24/20 12:32**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 76.7**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.45 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 22:26       | KJP     | TAL SAC |

**Client Sample ID: 20FAI-LM-88**

**Lab Sample ID: 320-63125-11**

**Date Collected: 07/24/20 12:24**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | D 2216       |     | 1          |                |              | 399182       | 07/28/20 18:15       | JCB     | TAL SAC |

**Client Sample ID: 20FAI-LM-88**

**Lab Sample ID: 320-63125-11**

**Date Collected: 07/24/20 12:24**

**Matrix: Solid**

**Date Received: 07/28/20 11:15**

**Percent Solids: 94.4**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | SHAKE          |     |            | 5.39 g         | 10.0 mL      | 399186       | 07/28/20 18:39       | AZ      | TAL SAC |
| Total/NA  | Analysis   | 537 (modified) |     | 1          |                |              | 399992       | 07/30/20 22:35       | KJP     | TAL SAC |

**Laboratory References:**

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

# Accreditation/Certification Summary

Client: Shannon & Wilson, Inc  
 Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

## Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority          | Program               | Identification Number | Expiration Date |
|--------------------|-----------------------|-----------------------|-----------------|
| Alaska (UST)       | State                 | 17-020                | 01-20-21        |
| ANAB               | Dept. of Defense ELAP | L2468                 | 01-20-21        |
| ANAB               | Dept. of Energy       | L2468.01              | 01-20-21        |
| ANAB               | ISO/IEC 17025         | L2468                 | 01-20-21        |
| Arizona            | State                 | AZ0708                | 08-11-20        |
| Arkansas DEQ       | State                 | 19-042-0              | 06-17-21        |
| California         | State                 | 2897                  | 01-31-22        |
| Colorado           | State                 | CA0004                | 08-31-20        |
| Connecticut        | State                 | PH-0691               | 06-30-21        |
| Florida            | NELAP                 | E87570                | 07-01-21        |
| Georgia            | State                 | 4040                  | 01-30-21        |
| Hawaii             | State                 | <cert No.>            | 01-29-21        |
| Illinois           | NELAP                 | 200060                | 03-17-21        |
| Kansas             | NELAP                 | E-10375               | 10-31-20        |
| Louisiana          | NELAP                 | 01944                 | 06-30-21        |
| Maine              | State                 | 2018009               | 04-14-22        |
| Michigan           | State                 | 9947                  | 01-31-22        |
| Nevada             | State                 | CA000442020-1         | 07-31-20        |
| New Hampshire      | NELAP                 | 2997                  | 04-18-21        |
| New Jersey         | NELAP                 | CA005                 | 06-30-21        |
| New York           | NELAP                 | 11666                 | 04-01-21        |
| Oregon             | NELAP                 | 4040                  | 01-29-21        |
| Pennsylvania       | NELAP                 | 68-01272              | 03-31-21        |
| Texas              | NELAP                 | T104704399-19-13      | 06-01-21        |
| US Fish & Wildlife | US Federal Programs   | 58448                 | 07-31-20        |
| USDA               | US Federal Programs   | P330-18-00239         | 07-31-21        |
| Utah               | NELAP                 | CA000442019-01        | 02-28-21        |
| Vermont            | State                 | VT-4040               | 04-16-21        |
| Virginia           | NELAP                 | 460278                | 03-14-21        |
| Washington         | State                 | C581                  | 05-05-21        |
| West Virginia (DW) | State                 | 9930C                 | 12-31-20        |
| Wyoming            | State Program         | 8TMS-L                | 01-28-19 *      |

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

| Method         | Method Description                               | Protocol | Laboratory |
|----------------|--|----------|------------|
| 537 (modified) | Fluorinated Alkyl Substances                     | EPA      | TAL SAC    |
| D 2216         | Percent Moisture                                 | ASTM     | TAL SAC    |
| SHAKE          | Shake Extraction with Ultrasonic Bath Extraction | SW846    | TAL SAC    |

#### Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

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

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# Sample Summary

Client: Shannon & Wilson, Inc  
Project/Site: Fairbanks International Airport

Job ID: 320-63125-1

| Lab Sample ID | Client Sample ID | Matrix | Collected      | Received       | Asset ID |
|---------------|------------------|--------|----------------|----------------|----------|
| 320-63125-1   | 20FAI-LM-01      | Solid  | 07/23/20 15:26 | 07/28/20 11:15 |          |
| 320-63125-2   | 20FAI-LM-02      | Solid  | 07/23/20 15:20 | 07/28/20 11:15 |          |
| 320-63125-3   | 20FAI-LM-03      | Solid  | 07/23/20 15:45 | 07/28/20 11:15 |          |
| 320-63125-4   | 20FAI-LM-04      | Solid  | 07/23/20 15:54 | 07/28/20 11:15 |          |
| 320-63125-5   | 20FAI-LM-05      | Solid  | 07/23/20 16:22 | 07/28/20 11:15 |          |
| 320-63125-6   | 20FAI-LM-06      | Solid  | 07/23/20 16:30 | 07/28/20 11:15 |          |
| 320-63125-7   | 20FAI-LM-07      | Solid  | 07/23/20 16:36 | 07/28/20 11:15 |          |
| 320-63125-8   | 20FAI-LM-08      | Solid  | 07/24/20 12:34 | 07/28/20 11:15 |          |
| 320-63125-9   | 20FAI-LM-09      | Solid  | 07/24/20 12:45 | 07/28/20 11:15 |          |
| 320-63125-10  | 20FAI-LM-10      | Solid  | 07/24/20 12:32 | 07/28/20 11:15 |          |
| 320-63125-11  | 20FAI-LM-88      | Solid  | 07/24/20 12:24 | 07/28/20 11:15 |          |

Address:

Regulatory Program:  DW  NPDES  RCRA  Other:

|   |  |  |  |                              |  |                     |  |                        |  |
|---|--|--|--|------------------------------|--|---------------------|--|------------------------|--|
| Client Contact                                  |  | Project Manager: <u>Marcy Nadel</u>  |  | Site Contact:                |  | Date:               |  | COC No:                |  |
| Company Name: <u>Shannon &amp; Wilson, Inc.</u> |  | Tell/Email: <u>mnadel@shannonwilson.com</u>                                  |  | Lab Contact:                 |  | Carrier:            |  | 1 of 1 COCs            |  |
| Address: <u>2355 Hill Road</u>                  |  | Analysis Turnaround Time   |  | Perform MS / MSD (Y / N)     |  | Sampler: <u>AMS</u> |  | For Lab Use Only:      |  |
| City/State/Zip: <u>Fairbanks AK 99709</u>       |  | <input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS |  | Filtered Sample (Y / N)      |  | Walk-in Client:     |  | Lab Sampling:          |  |
| Phone:  |  | TAT if different from Below  |  | Sample Type (C=Comp, G=Grab) |  | Job / SDG No.:      |  | Sample Specific Notes: |  |
| Fax:  |  | 5 day  |  | Matrix                       |  |                     |  |                        |  |
| Project Name: <u>103519-01A</u>                 |  | Sample Date  |  | Sample Time                  |  | Sample Cont.        |  |                        |  |
| Site: <u>Fairbanks International Airport</u>    |  | 7/23/20  |  | 1520                         |  | 1                   |  |                        |  |
| P O #   |  | 7/23/20  |  | 1520                         |  | 1                   |  |                        |  |
|   |  | 7/23/20  |  | 1545                         |  | 1                   |  |                        |  |
|   |  | 7/23/20  |  | 1554                         |  | 1                   |  |                        |  |
|   |  | 7/23/20  |  | 1622                         |  | 1                   |  |                        |  |
|   |  | 7/23/20  |  | 1630                         |  | 1                   |  |                        |  |
|   |  | 7/24/20  |  | 1636                         |  | 1                   |  |                        |  |
|   |  | 7/24/20  |  | 1234                         |  | 1                   |  |                        |  |
|   |  | 7/24/20  |  | 1245                         |  | 1                   |  |                        |  |
|   |  | 7/24/20  |  | 1232                         |  | 1                   |  |                        |  |
|   |  | 7/24/20  |  | 1224                         |  | 1                   |  |                        |  |



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Special Instructions/QC Requirements & Comments:

|  |                                 |                                 |                                    |                           |  |
|--|---------------------------------|---------------------------------|------------------------------------|---------------------------|--|
| Custody Seal No.: <u>1230981</u>             |                                 | Cooler Temp. (°C): <u>4.0°C</u> |                                    | Therm ID No.: <u>AK-7</u> |  |
| Relinquished by: <u>Shannon &amp; Wilson</u> | Received by: <u>[Signature]</u> | Company: <u>ETAW Soc</u>        | Date/Time: <u>28 July 20 11:15</u> |                           |  |
| Relinquished by: <u>[Signature]</u>          | Received by: <u>[Signature]</u> | Company:                        | Date/Time:                         |                           |  |
| Relinquished by:                             | Received in Laboratory by:      | Company:                        | Date/Time:                         |                           |  |



# Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-63125-1

**Login Number: 63125**

**List Source: Eurofins TestAmerica, Sacramento**

**List Number: 1**

**Creator: Nelson, Kym D**

| Question  | Answer | Comment          |
|---|--------|------------------|
| Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.      | True   |                  |
| The cooler's custody seal, if present, is intact.   | True   | 1030980, 1030981 |
| 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   | gel packs        |
| 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 <math><6\text{mm}</math> (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:

Dana Fjare

Title:

Environmental Scientist

Date:

8/11/20

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins TestAmerica, Sacramento

Laboratory Report Number:

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

ADEC File Number:

N/A

Hazard Identification Number:

N/A

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

**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:

TestAmerica/Eurofins Laboratories West Sacramento, CA is CS certified for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) by method 537.

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:

Analysis was performed by Eurofins TestAmerica laboratory in Sacramento, CA.

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:

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

Yes  No  N/A  Comments:

No preservation, other than chilling, is required for PFAS analysis.

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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

Yes  No  N/A  Comments:

The laboratory report noted the samples were received 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:

The laboratory report did not note any sample handling discrepancies.

e. Data quality or usability affected?

Comments:

Data quality and usability were not affected; see above.

4. Case Narrative

a. Present and understandable?

Yes  No  N/A  Comments:

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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

Yes  No  N/A  Comments:

The matrix spike (MS) recovery in preparation batch 320-399186 and analytical batch 320-399992 was outside control limits for the analytes perfluorooctanesulfonic acid (PFOS) and 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptable limits. See Section 6.c.iii.

The result for the analyte perfluorohexanesulfonic acid (PFHxS) was manually integrated in sample 20FAI-LM-05. The qualitative identification of the analyte has some degree of uncertainty and the result was flagged 'I' by the laboratory.

The laboratory applied an 'I' qualifier to the perfluorohexanesulfonic acid (PFHxS) result for sample 20FAI-LM-05 to indicate the transition mass ratio was outside established ratio limits.

The samples 20FAI-LM-01, 20FAI-LM-02, 20FAI-LM-03, 20FAI-LM-04, 20FAI-LM-05, MS 320-63125-A-1, and MSD 320-63125-A-1 were slightly yellow after final volume.

c. Were all corrective actions documented?

Yes  No  N/A  Comments:

The laboratory did not specify any corrective actions.

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

Comments:

The laboratory did not specify an effect on data quality or usability. However, we have flagged the PFHxS results for sample 20FAI-LM-05 as estimated ("J-flagged") due to the I flag reported by the laboratory.

## 5. Samples Results

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

Yes  No  N/A  Comments:

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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:

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

Yes  No  N/A  Comments:

e. Data quality or usability affected?

Data quality and usability were not affected; see above.

6. QC Samples

a. Method Blank

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

Yes  No  N/A  Comments:

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:

N/A; project analytes were not detected in the method blank.

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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

Yes  No  N/A  Comments:

Project analytes were not detected in the method blank.

v. Data quality or usability affected?

Comments:

Data quality and usability are not affected; see above.

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:

An LCS was reported for soil analysis.

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

Yes  No  N/A  Comments:

Metals/Inorganic analyses were not requested with this work order.

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:

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:

N/A; see above.

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

Comments:

N/A; LCS accuracy was within laboratory control limits.

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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

Yes  No  N/A  Comments:

N/A; LCS accuracy was within laboratory control limits.

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

Comments:

Data quality and usability were not affected; see above.

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:

An MS/MSD was reported for soil analysis.

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

Yes  No  N/A  Comments:

Metals/inorganics analysis was not requested with this work order.

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

Yes  No  N/A  Comments:

The matrix spike (MS) recovery for preparation batch 320-399186 and analytical batch 320-399992 was outside control limits for the analytes PFOS and 11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid.

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:

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

Comments:

The original sample for the MS is project sample 20FAI-LM-01.

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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

Yes  No  N/A  Comments:

The analyte 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid was not detected in *20FAI-LM-01*; therefore, the result does not require qualification for the high MS recovery.

The detected result for PFOS in *20FAI-LM-01* is considered to be affected by the high MS recovery for that analyte. The PFOS result is flagged 'JH' to identify the estimated result, biased high.

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

Comments:

Yes; see above.

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:

IDA recovery was within laboratory control limits.

iv. Data quality or usability affected?

Comments:

Data quality and usability are not affected; see above.



320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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:

Volatile analyses were not requested, so a trip blank was not required.

- 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:

A trip blank was not submitted with this work order.

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

Yes  No  N/A  Comments:

A trip blank was not submitted with this work order.

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

Comments:

N/A; a trip blank was not submitted with this work order.

- v. Data quality or usability affected?

Comments:

Data quality and usability are not affected; see above.

f. Field Duplicate

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

Yes  No  N/A  Comments:

- ii. Submitted blind to lab?

Yes  No  N/A  Comments:

Field duplicate sample pairs 20FAI-LM-08 and 20FAI-LM-88 were submitted with this work order.

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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

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

Where  $R_1$  = Sample Concentration  
 $R_2$  = Field Duplicate Concentration

Yes  No  N/A  Comments:

The RPD values were within the project objective of 50% for soil for the detected analyte PFHxS. Other analytes were not detected in the duplicate pair, so an RPD could not be calculated.

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

Comments:

Data quality and/or usability were not affected. See above.

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

Yes  No  N/A  Comments:

Reusable equipment was not used for this project, so an equipment blank was not submitted with this work order.

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

Yes  No  N/A  Comments:

N/A; an equipment blank was not submitted with this work order.

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

Comments:

N/A; an equipment blank was not submitted with this work order.

iii. Data quality or usability affected?

Comments:

Data quality and usability were not affected; see above.

320-63125-1

Laboratory Report Date:

8/3/20

CS Site Name:

N/A

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

a. Defined and appropriate?

Yes  No  N/A

Comments:

The PFHxS result for sample *20FAI-LM-05* is considered estimated and flagged 'J' because the transition mass ratio did not meet laboratory acceptance criteria. The laboratory analyst used professional judgement to identify the analyte but there is some degree of uncertainty in this determination.

# Important Information

About Your Geotechnical/Environmental Report

IMPORTANT INFORMATION

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

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

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

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

## SUBSURFACE CONDITIONS CAN CHANGE.

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

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

## MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

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

your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

### A REPORT'S CONCLUSIONS ARE PRELIMINARY.

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

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

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

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

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

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

### READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims

being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

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

IMPORTANT INFORMATION