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ACRONYMS AND ABBREVIATIONS

| | |
|--------|---|
| ADEC | Alaska Department of Environmental Conservation |
| AFFF | Aqueous Film Forming Foam |
| DO | Dissolved Oxygen |
| DQO | Data Quality Objective |
| EPA | Environmental Protection Agency |
| GAC | Granular Activated Carbon |
| IDW | Investigation-Derived Waste |
| KPC | Kenai Peninsula College |
| LCS | Laboratory Control Sample |
| LDRC | Laboratory Data Review Checklist |
| LHA | Lifetime Health Advisory |
| MAPTS | Mining and Petroleum Training Site |
| ng/L | Nanograms per liter |
| MS/MSD | Matrix Spike/Matrix Spike Duplicate |
| mV | Millivolts |
| NRC | NRC Alaska, LLC |
| NTU | Nephelometric Turbidity Unit |
| ORP | Oxidation-Reduction Potential |
| PFAS | Per- Polyfluoroalkyl Substances |
| PFOA | Perfluorooctanoic Acid |
| PFOS | Perfluorooctanesulfonic Acid |
| SGS | SGS North America Inc. |
| UAA | University of Alaska Anchorage |

**2020 GROUNDWATER AND DRINKING WATER MONITORING
UAA KENAI PENINSULA COLLEGE MAPTS
MILE 3.2 KALIFORNSKY BEACH ROAD
SOLDOTNA, ALASKA**

1.0 INTRODUCTION

This report presents the results of Shannon & Wilson's 2020 groundwater monitoring at the University of Alaska Anchorage's (UAA) Kenai Peninsula College (KPC) former Mining and Petroleum Training Site (MAPTS). The former MAPTS is located on the KPC campus between College Loop Road and Kalifornsky Beach Road in Soldotna, Alaska, as shown on Figure 1.

Written authorization to proceed with this work was received from UAA Facilities Planning and Construction with Purchase Order No. P0543926, issued July 28, 2020.

2.0 BACKGROUND

The MAPTS was used for fire training from approximately 1980 to 1988. The fire suppressants used during training at the MAPTS included primarily water, but also sodium bicarbonate, ABC multipurpose dry chemical (a mix of monoammonium phosphate and ammonium sulfate), and aqueous film forming foams (AFFF). AFFF contain fluorosurfactants including two substances, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), which are emerging Per- and Polyfluoroalkyl Substances (PFAS) that the Alaska Department of Environmental Conservation (ADEC) became aware of in 2012 during site remediation work conducted at the MAPTS.

Groundwater monitoring to evaluate PFOS and PFOA concentrations has been conducted at the former MAPTS since 2013. Analytical groundwater sampling was initiated in site wells surrounding the former Cell 2 remediation area. The approximate location of former Cell 2 remediation area and the site's groundwater monitoring wells are shown on Figure 2. PFOA, PFOS, and/or PFAS concentrations were measured in Wells B4MW and B5MW (located along the western boundary of UAA property) at levels that exceed the former ADEC Table C cleanup levels and the current Environmental Protection Agency (EPA) Lifetime Health Advisory (LHA) action level from 2014 to 2019. However, neither PFOS nor PFOA has been detected in off-site Wells B7MW and B8MW, suggesting that the PFOS groundwater plume has been delineated to the northwest, which is the downgradient direction of inferred groundwater flow.

In November 2016, one monitoring well (Well B9MW) was installed downgradient of Wells B4MW and B5MW to determine the leading edge of the plume. Groundwater samples collected from Well B9MW in 2016 through 2019 contained detectable PFOS and/or PFOA at concentrations less than the former applicable ADEC Table C cleanup. These data indicate the leading edge of the PFOS/PFOA plume in groundwater, with respect to apparent west/northwest groundwater flow direction, appears to be between Monitoring Wells B4MW and B5MW, located at the western boundary of the UAA property, and Well B9MW, located approximately 325 feet northwest of Well B4MW.

In 2014, five drinking water wells were sampled for PFOS and PFOA on the Leads, Giesler, Straume, Thomson, and Henry properties to the north/northwest of the former MAPTS; all results were reported as non detect. During November 2016, the five wells sampled in 2014 and four additional drinking water wells located on the Avigo, Swan, Camp, and KB properties were sampled. Four of the nine drinking water wells sampled (Swan, Camp, Henry, and KB Properties) contained detectable concentrations or estimated concentrations of PFOS and/or PFOA below the ADEC Table C cleanup levels. The detected concentrations of PFOS and PFOA were also less than the EPA LHA of 70 nanograms per liter (ng/L) for the sum of PFOS and PFOA combined. The Swan, Camp, Henry, and KB Properties wells were sampled in May 2018. The wells at Camp, Henry, and KB Properties contained detectable concentrations or estimated concentrations of PFOS and/or PFOA less than the applicable cleanup levels.

3.0 FIELD ACTIVITIES

The overall project purpose is to obtain a Cleanup Complete designation from the ADEC, with or without Institutional Controls. The field activities consisted of collecting groundwater and drinking water samples, determining groundwater flow direction, and disposing of investigation-derived waste (IDW). Under subcontract to Shannon & Wilson, SGS North America Inc. (SGS) analyzed the groundwater and drinking water samples.

The field activities were conducted in material accordance with our ADEC-approved August 18, 2020 work plan. Field notes are provided in Appendix A.

3.1 Groundwater Sampling

On October 21 and 22, 2020, a low-flow method was used to purge and sample Monitoring Wells B4MW, B5MW, and B9MW. The pump inlet was set to within approximately 2 feet of the top of the water column. The pump was operated at approximately 0.5 liters per minute with a goal of limiting sustained water drawdown to a maximum of 0.3 foot. Water quality

parameters were monitored at approximately 3 to 5-minute intervals. Groundwater samples were collected when four out of the six water quality parameters (pH, temperature, specific conductance, dissolved oxygen [DO], oxidation-reduction potential [ORP], and turbidity) stabilized in each well and water levels recharged to at least 80 percent of the pre-purge water volumes in each well. Water quality parameters were considered stabilized when three consecutive measurements indicate that: pH was within 0.1 unit, temperature was within 3 percent, DO was within 10 percent, specific conductance was within 3 percent, oxidation-reduction potential (ORP) was within 10 millivolts (mV), and turbidity was within 10 percent or less than 10 Nephelometric Turbidity Units (NTUs). Water for the samples was transferred directly into laboratory-supplied containers and placed in a chilled cooler for delivery to the project laboratory. The purging and sampling data are summarized in Table 1. Water sampling logs are provided in Appendix A.

3.2 Drinking Water Sampling

On October 21, 2020, drinking water samples were collected from drinking water systems at four properties identified as Swan, Camp, Henry, and KB Properties. Prior to sampling the wells, the property owners were notified and provided written or verbal permission to collect the drinking water samples. The approximate locations of the drinking water wells are shown on Figure 2.

To prevent possible cross contamination, the well heads for the drinking water wells were not opened during sampling. Instead, the spigot or faucet closest to the well was used to collect the drinking water sample. Each well system was purged for at least 15 minutes prior to sampling to remove water from the system piping and to obtain a representative sample of formation groundwater. The KB Properties (Sample KBP) well was sampled upgradient of potential water treatment units. The Henry (Sample HEN) well was sampled from a spigot on the south side of the building. Samples from the Swan (Sample SWAN) and Camp (Sample CAMP) wells were collected from sinks downgradient of potential water treatment units. One duplicate sample (Sample CAMP2) was collected from the well on the property identified as Camp. The drinking water samples were placed in a chilled cooler and delivered to SGS using chain-of-custody procedures.

3.3 Groundwater Flow Direction

On October 21, 2020, prior to well sampling, the static water levels were measured in Monitoring Wells B4MW, B5MW, and B9MW using an electronic water level probe. The water level probe was decontaminated prior to insertion in each well. The water level measurements and calculated elevations are provided in Table 1. The approximate groundwater flow direction using the October 21, 2020 measurements was towards the northwest, as shown on Figure 2,

which is consistent with previous groundwater flow directions. The water level calculated elevations are provided on Figure 2.

3.4 Investigation-Derived Waste Treatment and Disposal

IDW for this project consisted of purge water and disposable sampling materials such as gloves and tubing. The disposable sampling materials were disposed as unregulated solid waste at the local landfill. The purge water was treated by passing the water through granulated activated carbon (GAC) and discharging the treated water to the ground surface. The used GAC was retained and will be disposed by NRC Alaska, LLC (NRC) following future sampling events.

4.0 LABORATORY ANALYSIS

The four groundwater and five drinking water samples, including two duplicate sample sets, were analyzed for PFAS by EPA Method 537M. The SGS laboratory report is provided in Appendix B.

5.0 DISCUSSION OF RESULTS

The analytical groundwater and drinking water results were compared to the EPA LHA action level adopted by the ADEC in the October 2, 2019 *Technical Memorandum for PFAS*. The EPA action level is 70 ng/L for the sum of PFOS and PFOA. The groundwater analytical results are summarized in Table 2 and the drinking water analytical results are summarized in Table 3. Historical groundwater and drinking water analytical results are summarized in Tables 4 and 5, respectively. A copy of the analytical laboratory report is provided in Appendix B.

5.1 Groundwater Analytical Results

Samples from each of the three monitoring wells tested contained detectable concentrations of PFAS substances. The concentrations of total PFAS detected in the samples from Well B4MW (maximum of 2,310 ng/L) and Well B5MW (550 ng/L) are greater than the EPA LHA action level of 70 ng/L. The concentration of total PFAS detected in the sample from Well B9MW (12.2 ng/L) is less than the EPA LHA action level.

The October 2020 groundwater sample results are generally consistent with historical data. PFAS levels in Wells B4MW and B5MW continue to exceed the action level, however, the concentrations in B5MW show a decreasing trend since the May 2018 sampling event.

5.2 Drinking Water Sample Analytical Results

Only one of the four wells tested in October 2020 contained detectable concentrations of PFAS constituents (Camp Property). The concentrations of total PFAS detected in the samples collected from the Camp Property well (maximum of 21 ng/L) are less than the EPA LHA action level of 70 ng/L. The Camp samples also contained concentrations of perfluorohexanesulfonic acid (maximum of 26.6 ng/L) and perfluorohexanoic acid (4.8 ng/L). These analytes do not have ADEC or EPA action levels. The remaining PFAS constituents were not detected in any of the wells.

The October 2020 drinking water results are generally consistent with previous data. PFAS concentrations from the samples collected from the Swan, Henry, and KB Properties remain non detect or show a decrease since the May 2018 sampling event. Samples collected from the Camp Property show a slight increase since 2019, however, remain consistent with historical results.

5.3 Quality Assurance Summary

The project laboratory implements on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQOs). Internal laboratory controls to assess data quality for this project includes surrogates, method blanks, laboratory control samples (LCS), and matrix spike/matrix spike duplicates (MS/MSD) to assess precision, accuracy, and matrix bias. If a DQO was not met, the project laboratory provides a report specific note identifying the problem in the case narrative section of their Laboratory Analysis Report (See Appendix B).

One duplicate groundwater (B4MW/B14MW) and drinking water (CAMP/CAMP2) sample set were collected to assess precision of the sampling and analysis processes using the calculated relative percent difference (RPD). All of the RPDs are within the ADEC recommended DQO of 30 percent for groundwater.

A concentration of 6:2 fluorotelomer sulfonate (3.6 ng/L) was detected in the method blank associated with all of the project samples. Concentrations detected in Samples B4MW, B5MW, and B14MW are greater than 10 times the blank concentration or non detect, therefore flagging is not required.

Shannon & Wilson reviewed the SGS data deliverables and completed the ADEC's Laboratory Data Review Checklist (LDRC), which is included in Appendix B. Quality control discrepancies and the impact to data quality/usability are described in further detail in the LDRC. In our opinion, no non-conformances that would adversely impact data usability were noted, and we find the project data to be complete and useable to support the project purpose and objectives.

6.0 SUMMARY AND CONCLUSIONS

PFAS continues to be measured in Monitoring Wells B4MW and B5MW at concentrations greater than the EPA LHA action level. PFAS also continues to be detected in Monitoring Well B9MW, but at concentrations less than the EPA LHA action level.

The PFAS plume appears to be delineated to the west/northwest of former Cell 2 excavation. The leading edge of the PFAS plume in groundwater, with respect to apparent west/northwest flow direction, appears to remain between Monitoring Wells B4MW and B5MW, located at the western boundary of the UAA property, and Well B9MW, located approximately 325 feet northwest of Well B4MW. This is consistent with the findings of past sampling events.

Drinking water samples collected in October 2020 from the Camp well contained concentrations of PFAS less than the ADEC cleanup level and less than the EPA LHA summed action level. PFAS constituents were not detected in the samples collected from the Henry, Swan, and KB Properties wells, which is consistent with historical data.

7.0 CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives. The findings we have presented within this report are based on the limited sampling and analyses that we conducted. They should not be construed as definite conclusions regarding the project site's groundwater conditions. It is possible that our subsurface tests missed higher levels, although our intention was to sample in accordance with the ADEC-approved work plan. As a result, the sampling and analyses performed can only provide you with our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised. Shannon & Wilson has prepared the document in Appendix C, Important Information About Your Geotechnical/Environmental Report, to assist you and others in understanding the use and limitations of our reports.

You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore has not, and will not, disclose the results of this study unless specifically requested and authorized by you, or as required by law.

We appreciate the opportunity to be of service. Please contact the undersigned at (907) 561-2120 with any questions or comments concerning the contents of this report.

SHANNON & WILSON, INC.



Alec J. Rizzo
Environmental Staff

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Senior Associate

**TABLE 1
WELL SAMPLING LOG**

| | Monitoring Wells | | |
|---|---------------------------|---------------------|---------------------|
| | B4MW | B5MW | B9MW |
| Water Level Measurement Data | | | |
| Date Water Level Measured | 10/21/2020 | 10/21/2020 | 10/21/2020 |
| Time Water Level Measured | 14:45 | 14:30 | 14:18 |
| Depth to Water Below Measuring Point (feet) | 22.59 | 20.12 | 25.77 |
| Well Stickup (feet) | 2.7 | 2.8 | 2.5 |
| Depth to Water Below Ground Surface (feet) | 19.89 | 17.32 | 23.27 |
| Measuring Point Elevation* (feet) | 92.32 | 92.09 | 95.01 |
| Groundwater Elevation* (feet) | 69.73 | 71.97 | 69.24 |
| Purging/Sampling Data | | | |
| Date Sampled | 10/22/2020 | 10/22/2020 | 10/21/2020 |
| Time Sampled | 11:50 | 10:37 | 15:50 |
| Depth to Water Below MP (feet) | 22.59 | 20.12 | 25.77 |
| Total Depth of Well Below MP (feet) | 26.49 | 25.09 | 30.40 |
| Water Column in Well (feet) | 3.90 | 4.97 | 4.63 |
| Gallons per Foot | 0.16 | 0.16 | 0.16 |
| Gallons in Well | 0.62 | 0.80 | 0.74 |
| Gallons Purged | 2.7 | 4.2 | 4.3 |
| Purging/Sampling Method | Submersible pump | Submersible pump | Submersible pump |
| Diameter of Well Casing | 2-inch | 2-inch | 2-inch |
| Water Quality Data at Time of Sampling | | | |
| Temperature (°C) | 4.68 | 4.54 | 5.38 |
| Specific Conductance (µS/cm) | 240 | 120 | 202 |
| pH (standard units) | 6.55 | 6.07 | 6.26 |
| Dissolved Oxygen (mg/L) | 0.82 | 5.10 | 5.98 |
| Oxidation-Reduction Potential (mV) | 216.6 | 230.7 | 240.4 |
| Turbidity (NTU) | 1.68 | 0.73 | 5.29 |
| Remarks | Duplicate Sample B14MW | | |

Notes:

Water quality parameters were measured with and YSI and MicroTPW water quality instruments.

* = Well survey conducted by McLane Consulting on January 24, 2016. Elevation based on North American Vertical Datum of 1988.

°C = degrees Celsius

mg/L = milligrams per liter

µS/cm = microsiemens per centimeter

mV = millivolts

NTU = Nephelometric Turbidity Unit

MP = Measuring point

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

| Parameter Tested | Method* | EPA LHA (ng/L) | Sample ID Number^ and Depth of Groundwater Below Ground Surface in Feet (See Table 1 and Figure 2) | | | |
|---|----------|----------------|--|-----------------|---------------|---------------|
| | | | Monitoring Wells | | | |
| | | | B4MW 19.89 | B14MW~ 19.89 | B5MW 17.32 | B9MW 23.27 |
| Perfluorobutanoic acid - ng/L | EPA 537M | - | 67.6 | 66.7 | 77.8 | <17 |
| Perfluoropentanoic acid - ng/L | EPA 537M | - | 275 | 271 | 292 | <8.3 |
| Perfluorohexanoic acid - ng/L | EPA 537M | - | 292 | 271 | 230 | <8.3 |
| Perfluoroheptanoic acid - ng/L | EPA 537M | - | 295 | 294 | 241 | <8.3 |
| Perfluorononanoic acid - ng/L | EPA 537M | - | 633 | 594 | 85.9 | <8.3 |
| Perfluorodecanoic acid - ng/L | EPA 537M | - | 19.6 | 18.3 | 17.6 | <8.3 |
| Perfluoroundecanoic acid - ng/L | EPA 537M | - | 242 | 249 | 1,090 | <8.3 |
| Perfluorododecanoic acid - ng/L | EPA 537M | - | <8.3 | <8.3 | <8.3 | <8.3 |
| Perfluorotridecanoic acid - ng/L | EPA 537M | - | 10.5 | 10.1 | 22.7 | <8.3 |
| Perfluorotetradecanoic acid - ng/L | EPA 537M | - | <8.3 | <8.3 | <8.3 | <8.3 |
| Perfluorobutanesulfonic acid - ng/L | EPA 537M | - | 17.9 | 17.8 | 13.5 | <8.3 |
| Perfluoropentanesulfonic acid - ng/L | EPA 537M | - | 32.6 | 30.0 | 21.6 | <8.3 |
| Perfluorohexanesulfonic acid - ng/L | EPA 537M | - | 520 | 540 | 312 | 17.1 |
| Perfluoroheptanesulfonic acid - ng/L | EPA 537M | - | 44.1 | 46.8 | 14.7 | <8.3 |
| Perfluorononanesulfonic acid - ng/L | EPA 537M | - | <8.3 | <8.3 | <8.3 | <8.3 |
| Perfluorodecanesulfonic acid - ng/L | EPA 537M | - | <8.3 | <8.3 | <8.3 | <8.3 |
| PFOSA - ng/L | EPA 537M | - | <8.3 | <8.3 | <8.3 | <8.3 |
| MeFOSAA - ng/L | EPA 537M | - | <17 | <17 | <17 | <17 |
| EtFOSAA - ng/L | EPA 537M | - | <17 | <17 | <17 | <17 |
| 4:2 Fluorotelomer sulfonate - ng/L | EPA 537M | - | <17 | <17 | <17 | <17 |
| 6:2 Fluorotelomer sulfonate - ng/L | EPA 537M | - | 333 | 330 | 181 | <17 |
| 8:2 Fluorotelomer sulfonate - ng/L | EPA 537M | - | 252 | 240 | 238 | <17 |
| Perfluorooctanesulfonic acid (PFOS) - ng/L | EPA 537M | 70† | 1,960 | 1,870 | 429 | <8.3 |
| Perfluorooctanoic acid (PFOA) - ng/L | EPA 537M | 70† | 331 | 336 | 121 | 12.2 |
| Total Per- and Polyfluoroalkyl substances (PFAS) - ng/L | EPA 537M | 70† | 2,291 | 2,206 | 550 | 12.2 |

Notes:

- EPA LHA = Environmental Protection Agency Lifetime Health Advisory
- † = EPA LHA Level of 70 ng/L for PFOS and PFOA combined
- ^ = Sample ID number preceded by "104564-" on the chain-of-custody form
- <17 = Analyte not detected; laboratory reporting limit of 17 µg/L
- * = See the SGS laboratory report for laboratory reporting limits
- 67.6 = Analyte detected
- 2,291 = Reported concentration exceeds EPA LHA
- = Cleanup level not established
- ng/L = Nanograms per liter
- ~ = Duplicate of Sample B4MW

TABLE 3
SUMMARY OF DRINKING WATER ANALYTICAL RESULTS

| Parameter Tested | Method* | EPA LHA (ng/L) | Sample ID Number^, Parcel Owners Name, and Parcel ID Number (See Figure 2) | | | | |
|---|----------|-------------------|---|-------------------------|---------------------------|-------------------------|----------------------------|
| | | | Drinking Water Wells | | | | |
| | | | SWAN Swan 5543012 | CAMP Camp 5543011 | CAMP2~ Camp 5543011 | HEN Henry 5543008 | KBP KB Prop. 5543013 |
| Perfluorobutanoic acid - ng/L | EPA 537M | - | <7.1 | <7.1 | <7.1 | <7.1 | <7.1 |
| Perfluoropentanoic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorohexanoic acid - ng/L | EPA 537M | - | <3.6 | 4.8 | 4.8 | <3.6 | <3.6 |
| Perfluoroheptanoic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorononanoic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorodecanoic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluoroundecanoic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorododecanoic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorotridecanoic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorotetradecanoic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorobutanesulfonic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluoropentanesulfonic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorohexanesulfonic acid - ng/L | EPA 537M | - | <3.6 | 25.9 | 26.6 | <3.6 | <3.6 |
| Perfluoroheptanesulfonic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorononanesulfonic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorodecanesulfonic acid - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| PFOSA - ng/L | EPA 537M | - | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| MeFOSAA - ng/L | EPA 537M | - | <7.1 | <7.1 | <7.1 | <7.1 | <7.1 |
| EtFOSAA - ng/L | EPA 537M | - | <7.1 | <7.1 | <7.1 | <7.1 | <7.1 |
| 4:2 Fluorotelomer sulfonate - ng/L | EPA 537M | - | <7.1 | <7.1 | <7.1 | <7.1 | <7.1 |
| 6:2 Fluorotelomer sulfonate - ng/L | EPA 537M | - | <7.1 | <7.1 | <7.1 | <7.1 | <7.1 |
| 8:2 Fluorotelomer sulfonate - ng/L | EPA 537M | - | <7.1 | <7.1 | <7.1 | <7.1 | <7.1 |
| Perfluorooctanesulfonic acid (PFOS) - ng/L | EPA 537M | 70† | <3.6 | <3.6 | <3.6 | <3.6 | <3.6 |
| Perfluorooctanoic acid (PFOA) - ng/L | EPA 537M | 70† | <3.6 | 21.0 | 20.4 | <3.6 | <3.6 |
| Total Per- and Polyfluoroalkyl substances (PFAS) - ng/L | EPA 537M | 70† | <3.6 | 21.0 | 20.4 | <3.6 | <3.6 |

Notes:

- EPA LHA = Environmental Protection Agency Lifetime Health Advisory
† = EPA LHA Level of 70 ng/L for PFOS and PFOA combined
* = See the SGS laboratory report for laboratory reporting limits
^ = Sample ID number preceded by "104564-" on the chain-of-custody form
~ = Sample CAMP2 is the duplicate of Sample CAMP
ng/L = Nanograms per liter
<7.1 = Analyte not detected; laboratory reporting limit of 7.1 ng/L
4.8 = Analyte detected
- = Cleanup level not established

TABLE 4
SUMMARY OF HISTORICAL GROUNDWATER SAMPLE ANALYTICAL RESULTS

| Monitoring Well No. | Date Sampled | Depth to Static Water Level (bgs) | Parameter Tested | | |
|---------------------|----------------|-----------------------------------|------------------------------------|--|---|
| | | | Perfluorooctanoic acid (PFOA) ng/L | Perfluorooctanesulfonic Acid (PFOS) ng/L | Total Per- and Polyfluoroalkyl substances (PFAS) ng/L |
| RM4 | 3/5/2014* | 15.58 | 150 | 3,500 | - |
| | 6/17/2014 | 16.11 | - | - | - |
| | 11/13/2014 | 15.74 | - | - | - |
| B1MW | 3/5/2014 | 16.21 | 54 | 660 | - |
| | 6/17/2014 | 16.91 | 14 | 55 | - |
| | 11/13/2014 | 16.38 | 54 | 400 | - |
| | 3/21/2016 | 16.62 | 13.5 | 27.4 | - |
| B2MW | 3/5/2014 | 18.36 | 590 | 11 | - |
| | 6/17/2014 | 18.91 | - | - | - |
| | 11/13/2014 | 18.44 | - | - | - |
| B3MW | 12/5/2013 | 11.94 | 12 | 5.4 | - |
| | 3/4/2014 | 13.67 | 9.3 | - | - |
| | 6/17/2014 | 14.30 | - | - | - |
| | 11/13/2014 | 14.00 | - | - | - |
| B4MW | 6/18/2014* | 19.43 | 210 | 1,600 | - |
| | 11/13/2014* | 18.76 | 190 | 1,800 | - |
| | 3/21/2016* | 19.43 | 295 | 1,630 | - |
| | 6/28/2017* | 20.47 | 127 | 1,070 | - |
| | 5/16/2018* | 19.89 | 178 | 801 | 979 |
| | 9/5/2019* | 19.9 | 340 | 3,040 | 3,380 |
| 10/22/2020* | 19.89 | 336 | 1,960 | 2,296 | |
| B5MW | 6/18/2014 | 16.94 | 150 | 2,100 | - |
| | 11/13/2014 | 16.36 | 250 | 1,500 | - |
| | 3/21/2016 | 16.81 | 292 | 1,520 | - |
| | 6/28/2017 | 17.88 | 92.9 | 313 | - |
| | 5/16/2018 | 17.27 | 224 | 805 | 1,029 |
| | 9/5/2019 | 17.39 | 94.3 | 753 | 847 |
| | 10/22/2020 | 17.32 | 121 | 429 | 550 |
| B6MW | 3/5/2014 | 19.24 | 81 | 420 | - |
| | 6/17/2014 | 19.59 | 36 | 210 | - |
| | 11/14/2014 | 19.39 | 13 | 100 | - |
| | 3/20/2016 | 19.50 | <9.3 | 11.6 | - |
| B7MW | 7/22/2015 | 22.21 | <5 | <5 | - |
| | 3/20/2016 | 22.05 | <9.6 | <9.6 | - |
| B8MW | 7/22/2015 | 22.04 | <5 | <5 | - |
| | 3/20/2016 | 21.11 | <9.6 | <9.6 | - |
| B9MW | 11/30/2016* | 25.10 | 13.3 | 8.51 | - |
| | 6/28/2017 | 23.82 | 90.8 J | <16 B | - |
| | 5/16/2018 | 23.32 | 67.1 J | <17 | 6.71 J |
| | 9/5/2019 | 23.26 | 8.91 | <2 | 28 |
| | 10/21/2020 | 23.27 | 12.2 | <8.3 | 12.2 |
| | EPA LHA | | 70† | 70† | 70† |

Notes:

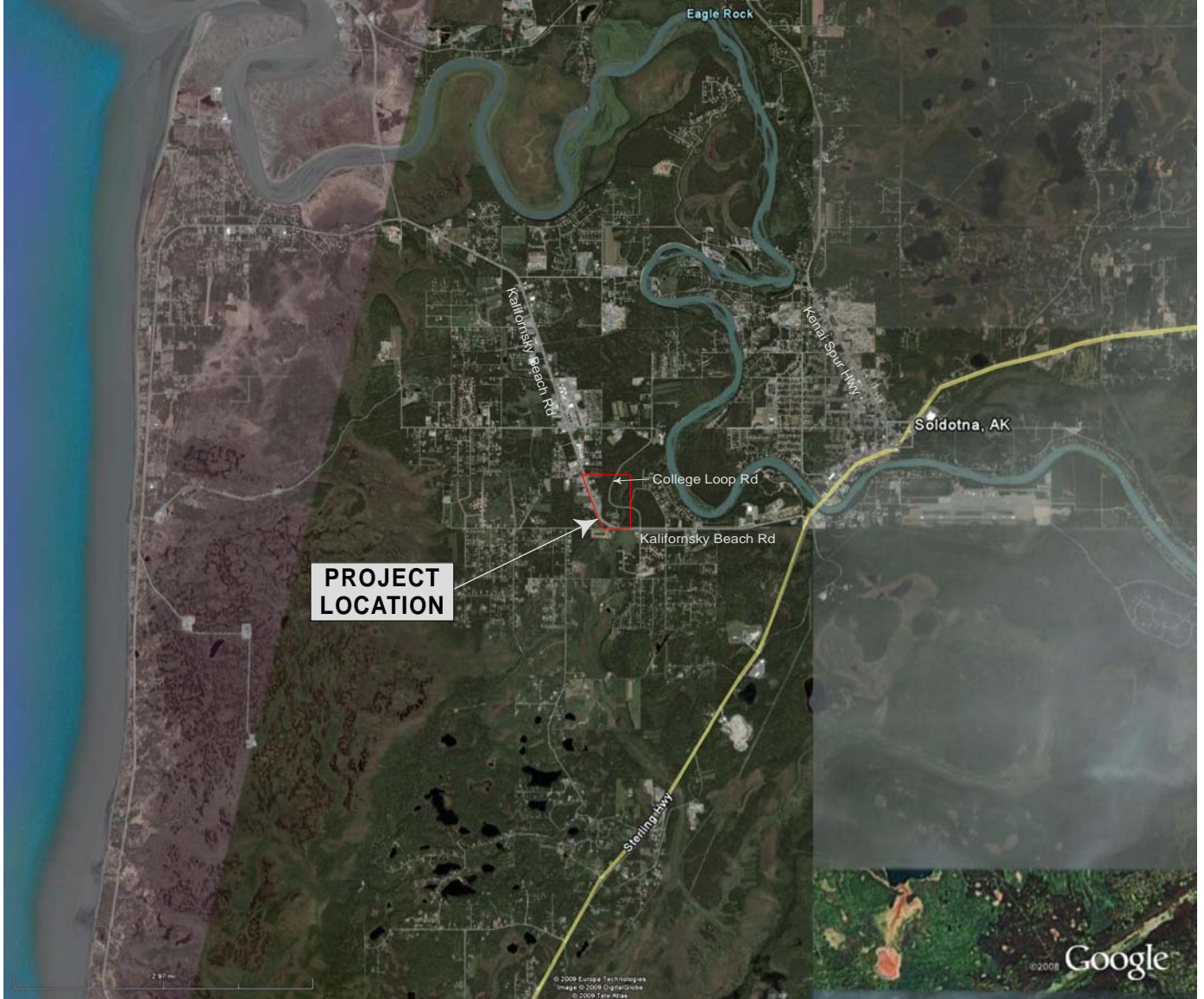
- EPA LHA = Environmental Protection Agency Lifetime Health Advisory
† = EPA LHA Level of 70 ng/L for PFOS and PFOA combined
54 = Analyte detected
550 = Reported concentration exceeds EPA LHA
J = Estimated concentration less than the reporting limit
* = Higher of primary/duplicate pair selected
<5 = Analyte not detected; laboratory reporting limit of 5 ng/L
B = Sample potentially affected by method blank detection
- = Not applicable or sample not tested for this analyte.
bgs = Below ground surface
ng/L = Nanograms per liter

TABLE 5
SUMMARY OF HISTORICAL DRINKING WATER SAMPLE ANALYTICAL RESULTS

| Drinking Water Well Owner and Parcel Number | Date Sampled | Parameter Tested | | |
|---|----------------|---------------------------------------|---|---|
| | | Perfluorooctanoic acid (PFOA) ng/L | Perfluorooctanesulfonic Acid (PFOS) ng/L | Total Per- and Polyfluoroalkyl substances (PFAS) ng/L |
| Leadens 5543021 | 2/24/2014 | <5.0 | <5.0 | - |
| | 11/29/2016 | <8.0 | <8.0 | - |
| Giesler 5543022 | 2/24/2014 | <5.0 | <5.0 | - |
| | 11/29/2016 | <8.0 | <8.0 | - |
| Avigo 5543024 | 2/24/2014 | - | - | - |
| | 11/29/2016 | <8.0 | <8.0 | - |
| Straume 5543025 | 2/24/2014 | <5.0 | <5.0 | - |
| | 11/29/2016 | <8.0 | <8.0 | - |
| Thomson 5543013 | 2/24/2014 | <5.0 | <5.0 | - |
| | 11/29/2016 | <8.0 | <8.0 | - |
| Swan 5543012 | 2/24/2014 | - | - | - |
| | 11/29/2016 | 2.81 J | <8.0 | - |
| | 6/28/2017 | <1.6 | <1.6 | - |
| | 9/7/2017* | 2.6 | <4.7 | - |
| | 5/16/2018 | <8.0 | <8.0 | <8.0 |
| 10/21/2020 | <3.6 | <3.6 | <3.6 | |
| Camp 5543011 | 2/24/2014 | - | - | - |
| | 11/29/2016 | 13.2 | 3.16 J | - |
| | 6/28/2017* | 9.43 J | 5.06 J | - |
| | 9/7/2017* | 16.0 | 4.0 J | - |
| | 5/16/2018* | 12.3 | 3.56 J | 15.86 J |
| 10/21/2020* | 21.0 | <3.6 | 21.0 | |
| Henry 5543008 | 2/24/2014 | <5.0 | <5.0 | - |
| | 11/29/2016 | <8.0 | 7.60 J | - |
| | 6/28/2017 | <17.0 | 5.51 J | - |
| | 9/7/2017* | 1.0 J | 4.1 J | - |
| | 5/16/2018 | <8.0 | 3.50 J | 3.50 J |
| 10/21/2020 | <3.6 | <3.6 | <3.6 | |
| KB Properties 5543007 | 2/24/2014 | - | - | - |
| | 11/29/2016 | <8.0 | 5.41 J | - |
| | 6/28/2017 | <1.7 J- | 7.01 J- | - |
| | 9/7/2017* | 1.0 J | 6.7 | - |
| | 5/16/2018 | <8.3 | 4.17 J | 4.17 J |
| 10/21/2020 | <3.6 | <3.6 | <3.6 | |
| | EPA LHA | 70† | 70† | 70† |

Notes:

- * = Higher of primary/duplicate pair selected
- † = EPA LHA Level of 70 ng/L for PFOS and PFOA combined
- ng/L = Nanograms per liter
- <5.0 = Analyte not detected; laboratory reporting limit of 5.0 ng/L
- 13.2** = Analyte detected
- = Not applicable or sample not tested for this analyte.
- J** = Estimated concentration less than the limit of quantitation.
- J-** = Concentration potentially biased low due to failed surrogate recovery



Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth Mapping Service



Mile 3.2 Kalifornsky Beach Road
Soldotna, Alaska

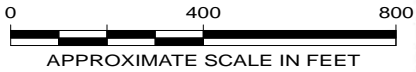
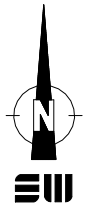
VICINITY MAP

December 2020


104564-001


SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1



LEGEND


 Approximate location of Monitoring Well B4MW with a groundwater elevation of 69.73' as determined by Shannon & Wilson's water level measurements taken on October 21, 2020.


 Approximate location of Giesler's drinking water well.

Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth Mapping Service. Imagery date: 4/17/2011

Mile 3.2 Kalifornsky Beach Road
Soldotna, Alaska

SITE PLAN

December 2020

104564-001


SHANNON & WILSON, INC.
 Geotechnical & Environmental Consultants

Fig. 2

APPENDIX A
FIELD NOTES

10/21/20

104564-001

AJR

- 0800 Arrive at Stw office, prep for sampling
- 0900 Depart Anchorage for Soldotna
- 1200 Arrive onsite → meet UAA KOC staff
- 1210 @ KB properties to take DW sample
- 1232 Finish @ KB properties
- 1240 @ Henry property to take DW sample
- 1259 Finish @ Henry property.
- 1305 @ camp property for DW sample
- 1327 Finish @ camp property
- 1330 @ Swan property for DW sample
- 1349 finish @ Swan property → with UAA staff to find wells.

1410 Start collecting DTWs from B4mw, B5mw, and B9mw

| <u>MW</u> | <u>DTW</u> | <u>DTB</u> | |
|-----------|------------|------------|------|
| B9mw | 29.77 | 30.40 | 1418 |
| B5mw | 20.12 | 25.09 | 1430 |
| B4mw | 22.59 | 26.49 | 1445 |

Rite in the Rain.

10/21/20

104564-001

AJR

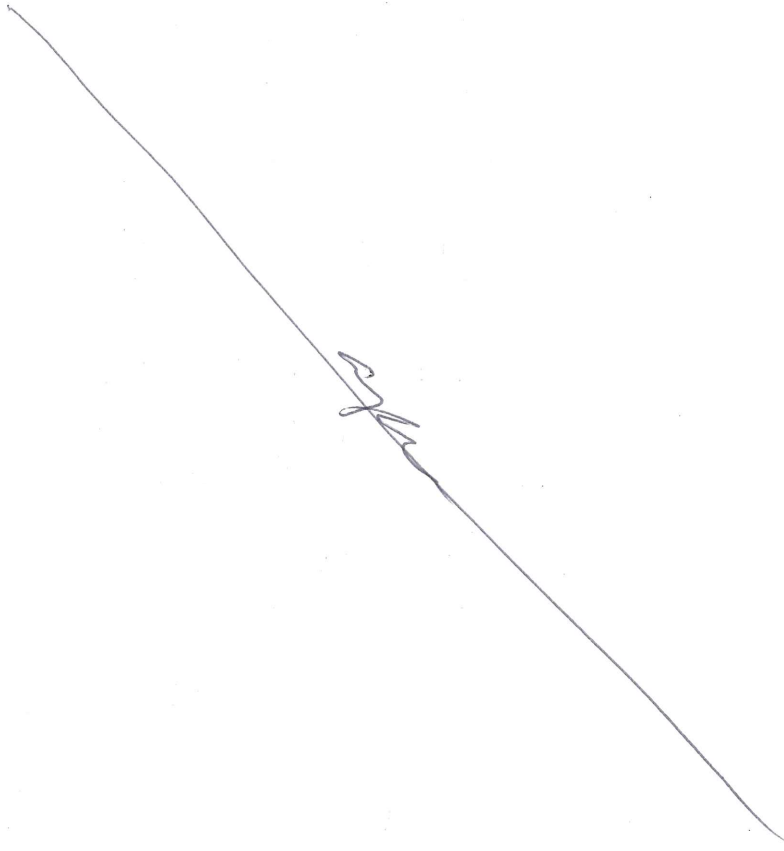
1452 @ B9MW

1610 Finish @ B9MW

1615 Depart site for Hotel

1630 Arrive @ hotel → unpack +
Sample management

1700 End of day



10/22/20

104564-001

AJR

0800 prep for sampling

0900 Arrive onsite → calibrate YSI
+ bring equipment to B5MW

0940 @ B5MW

1105 Finish @ B5MW

1110 @ B4MW

1205 Finish @ B4MW

1230 Finish packing up @ site.
Depart Soldotna for anchorage

1545 Arrive @ Stu office →
Sample management.

1610 Drop samples @ SOS

1830 End of Day → Finish
Activities

WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 104504 Location: AAA KPC Weather: 34° Sunny
Well No.: KBP
Date: 10/21/20 Time Started: 12:15^{PM} 12:10 Time Completed: 12:30
Develop Date: - Develop End Time: - (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: _____ Date of Depth Measurement: _____
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
Diameter of Casing: _____ Well Screen Interval: _____
Total Depth of Well Below MP: _____ Product Thickness, if noted: _____
Depth-to-Water (DTW) Below MP: _____
Water Column in Well: _____ (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: _____
Gallons in Well: _____ (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/21/20 Time Started: 12:15 Time Completed: 12:30
Three Well Volumes: _____ (Gallons in Well x 3)
Gallons Purged: 75 gal Depth of Pump Placement: _____
Maximum Drawdown: _____ Pump Rate: ~5 gal/min
Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

| Time: | Gallons: | Temp: (°C) | Sp. Cond.: (mS/cm) | DO: (mg/L) | pH: (S.U.) | ORP: (mV) | Turb: (ntu) | DTW (Feet) |
|-------|----------|---------------|-----------------------|---------------|---------------|--------------|----------------|---------------|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

SAMPLING DATA

Odor: None Color: clear
Sample Designation: 104504 - KBP Time / Date: 12:30 10/21/20
QC Sample Designation: - Time / Date: -
QA Sample Designation: - Time / Date: -

Evacuation Method: Dedicated Bladder Pump / Other: Spigot prior to treatment
Sampling Method: Dedicated Bladder Pump / Other: Spigot

Remarks: Spigot prior to treatment in Paintroom/Paintshop

Sampling Personnel: AVR

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 104564 Location: UGA KPC Weather: 34° Sunny
Well No.: SWAN
Date: 10/21/20 Time Started: 1330 Time Completed: 1349
Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: _____ Date of Depth Measurement: _____
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
Diameter of Casing: _____ Well Screen Interval: _____
Total Depth of Well Below MP: _____ Product Thickness, if noted: _____
Depth-to-Water (DTW) Below MP: _____
Water Column in Well: _____ (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: _____
Gallons in Well: _____ (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/21/20 Time Started: 1332 Time Completed: 1347
Three Well Volumes: _____ (Gallons in Well x 3)
Gallons Purged: 30 gal Depth of Pump Placement: _____
Maximum Drawdown: _____ Pump Rate: 2 gal/min
Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

| Time: | Gallons: | Temp: (°C) | Sp. Cond.: (mS/cm) | DO: (mg/L) | pH: (S.U.) | ORP: (mV) | Turb: (ntu) | DTW (Feet) |
|-------|----------|---------------|-----------------------|---------------|---------------|--------------|----------------|---------------|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

SAMPLING DATA

Odor: None Color: None - clear
Sample Designation: 104564 - Swan Time / Date: 1347 10/21/20
QC Sample Designation: — Time / Date: —
QA Sample Designation: — Time / Date: —

Evacuation Method: Dedicated Bladder Pump / Other: Bathroom sink
Sampling Method: Dedicated Bladder Pump / Other: outdoor sink
Remarks: Bathroom sink - no treatment in building

Sampling Personnel: _____

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 104564 Location: 44A KPC Weather: 23° sunny
 Well No.: B4MW
 Date: 10/22/20 Time Started: 1110 Time Completed: 1205
 Develop Date: — Develop End Time: — (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1445 Date of Depth Measurement: 10/21/20
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: —
 Total Depth of Well Below MP: 26.49 Product Thickness, if noted: —
 Depth-to-Water (DTW) Below MP: 22.59
 Water Column in Well: 3.9 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 0.62 (Water Column in Well x Gallons per foot)

Benchmark - 22.59

PURGING DATA

Date Purged: 10/22/20 Time Started: 1122 Time Completed: 1151
 Three Well Volumes: 1.86 (Gallons in Well x 3)
 Gallons Purged: 2.7 Depth of Pump Placement: ~24
 Maximum Drawdown: 0.08 Pump Rate: 0.5
 Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

| Time: | Gallons: | Temp: (°C) | Sp. Cond.: (mS/cm) | DO: (mg/L) | pH: (S.U.) | ORP: (mV) | Turb: (ntu) | DTW (Feet) |
|-------------|------------|---------------|-----------------------|---------------|---------------|--------------|----------------|---------------|
| <u>1132</u> | <u>1.1</u> | <u>4.24</u> | <u>0.235</u> | <u>0.62</u> | <u>6.42</u> | <u>225.7</u> | <u>2.21</u> | <u>22.67</u> |
| <u>1137</u> | <u>1.6</u> | <u>4.65</u> | <u>0.236</u> | <u>0.49</u> | <u>6.46</u> | <u>223.3</u> | <u>3.41</u> | <u>22.64</u> |
| <u>1142</u> | <u>2.1</u> | <u>4.78</u> | <u>0.241</u> | <u>0.53</u> | <u>6.51</u> | <u>219.7</u> | <u>1.90</u> | <u>22.64</u> |
| <u>1145</u> | <u>2.4</u> | <u>4.71</u> | <u>0.241</u> | <u>0.55</u> | <u>6.53</u> | <u>218.4</u> | <u>1.82</u> | <u>22.64</u> |
| <u>1148</u> | <u>2.7</u> | <u>4.68</u> | <u>0.240</u> | <u>0.82</u> | <u>6.55</u> | <u>216.6</u> | <u>1.68</u> | <u>22.64</u> |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

SAMPLING DATA

Odor: None Color: Clear
 Sample Designation: 104564-B4MW Time / Date: 1150 10/22/20
 QC Sample Designation: 104564-B4MW Time / Date: 1205 10/22/20
 QA Sample Designation: — Time / Date: —

Evacuation Method: Dedicated Bladder Pump / Other: Double whale
 Sampling Method: Dedicated Bladder Pump / Other: Double whale

Remarks: _____

Sampling Personnel: ASR

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 104564 Location: UAAA KPC Weather: 20° cloudy
 Well No.: B5MW
 Date: 10/22/20 Time Started: 940 Time Completed: 1105
 Develop Date: - Develop End Time: - (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1430 Date of Depth Measurement: 10/21/20
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
 Diameter of Casing: 2" Well Screen Interval: _____
 Total Depth of Well Below MP: 25.09 Product Thickness, if noted: _____
 Depth-to-Water (DTW) Below MP: 20.12
 Water Column in Well: 4.97 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: AV 0.80 0.10
 Gallons in Well: 0.50 (Water Column in Well x Gallons per foot)

Benchmark - 20.13

PURGING DATA

Date Purged: 10/22/20 Time Started: 954 Time Completed: 1037
 Three Well Volumes: 2.4 (Gallons in Well x 3)
 Gallons Purged: 4.2 Depth of Pump Placement: 222
 Maximum Drawdown: 0.07 Pump Rate: 0.5
 Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

| Time: | Gallons: | Temp: (°C) | Sp. Cond.: (mS/cm) | DO: (mg/L) | pH: (S.U.) | ORP: (mV) | Turb: (ntu) | DTW (Feet) |
|-------|----------|------------|--------------------|------------|------------|-----------|-------------|------------------------|
| 1004 | 1.1 | 4.40 | 0.112 | 6.18 | 5.49 | 268.0 | 3.12 | 20.13 20.20 |
| 1009 | 1.6 | 4.41 | 0.110 | 5.91 | 5.58 | 262.8 | 2.80 | 20.20 |
| 1014 | 2.1 | 4.47 | 0.117 | 5.04 | 5.69 | 256.0 | 1.72 | 20.20 |
| 1019 | 2.5 | 4.46 | 0.119 | 5.57 | 5.80 | 249.2 | 1.18 | 20.20 |
| 1024 | 3.1 | 4.52 | 0.117 | 5.35 | 5.92 | 241.4 | 0.97 | 20.20 |
| 1029 | 3.6 | 4.51 | 0.120 | 5.23 | 6.01 | 234.8 | 1.50 | 20.19 |
| 1032 | 3.9 | 4.51 | 0.119 | 5.17 | 6.04 | 232.7 | 1.05 | 20.19 |
| 1035 | 4.2 | 4.54 | 0.120 | 5.10 | 6.07 | 230.7 | 0.73 | 20.19 |

SAMPLING DATA

Odor: None Color: clear
 Sample Designation: 104564 - B5MW Time / Date: 1037 10/22/20
 QC Sample Designation: _____ Time / Date: _____
 QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Dedicated Bladder Pump / Other: Double wham
 Sampling Method: Dedicated Bladder Pump / Other: Double wham

Remarks: _____

Sampling Personnel: AJR

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 104564 Location: UAA KPL Weather: 39° Sunny
 Well No.: B9MW
 Date: 10/21/20 Time Started: 1452 Time Completed: 1610
 Develop Date: _____ Develop End Time: _____ (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 10/21/20 Date of Depth Measurement: 1418
 Measuring Point (MP): Top of PVC Casings / Top of Steel Protective Casing / Other: _____
 Diameter of Casing: 2" Well Screen Interval: _____
 Total Depth of Well Below MP: 30.40 Product Thickness, if noted: _____
 Depth-to-Water (DTW) Below MP: 25.77
 Water Column in Well: 4.63 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.16
 Gallons in Well: 0.74 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/21/20 Time Started: 1505 Time Completed: 1555
 Three Well Volumes: 2.22 (Gallons in Well x 3)
 Gallons Purged: 4.3 Depth of Pump Placement: 2.27
 Maximum Drawdown: 0.09 Pump Rate: 0.5
 Well Purged Dry: Yes No (If yes, use Well Purged Dry Log)

| Time: | Gallons: | Temp: (°C) | Sp. Cond.: (mS/cm) | DO: (mg/L) | pH: (S.U.) | ORP: (mV) | Turb: (ntu) | DTW (Feet) |
|-------|--------------------|---------------|-----------------------|---------------|---------------|--------------|----------------|---------------|
| 1515 | 1.2 | 5.84 | 0.206 | 6.53 | 5.83 | 206.3 | 32.91 | 25.84 |
| 1520 | 1.8 | 5.45 | 0.199 | 6.13 | 6.02 | 258.7 | 10.82 | 25.86 |
| 1525 | 2.3 | 5.47 | 0.202 | 5.97 | 6.11 | 254.0 | 6.22 | 25.84 |
| 1530 | 2.8 | 5.51 | 0.203 | 7.82 | 6.18 | 250.3 | 24.01 | 25.84 |
| 1535 | 3.3 | 5.62 | 0.203 | 6.29 | 6.21 | 245.9 | 12.99 | 25.84 |
| 1540 | 3.7 | 5.32 | 0.201 | 6.01 | 6.23 | 242.6 | 13.44 | 25.84 |
| 1543 | 3.7 4.0 | 5.39 | 0.200 | 6.02 | 6.25 | 241.3 | 9.81 | 25.83 |
| 1546 | 4.3 | 5.38 | 0.202 | 5.98 | 6.26 | 246.4 | 5.29 | 25.83 |
| | | | | | | | | |
| | | | | | | | | |

SAMPLING DATA

Odor: None Color: clear
 Sample Designation: 104564 - B9MW Time / Date: 1550 10/21/20
 QC Sample Designation: _____ Time / Date: _____
 QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Dedicated Bladder Pump / Other: Double whale
 Sampling Method: Dedicated Bladder Pump / Other: Double whale

Remarks: _____

Sampling Personnel: AJR

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
 ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23

APPENDIX B
RESULTS OF ANALYTICAL TESTING BY
SGS NORTH AMERICA INC. AND
ADEC LABORATORY DATA REVIEW CHECKLIST

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907)433-3223

Report Number: **1205868**

Client Project: **104564 UAA KPC**

Dear Dan McMahon,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.



Justin Nelson
2020.11.10
15:32:48 -09'00'

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1205868**
Project Name/Site: **104564 UAA KPC**
Project Contact: **Dan McMahon**

Refer to sample receipt form for information on sample condition.

104564-KBP (1205868001) PS

EPA 537.1 PFAS-24 Compound List were analyzed by SGS of Orlando, FL.

104564-B9MW (1205868006) PS

EPA 537 PFAS-24 Compound List were analyzed by SGS of Orlando, FL.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 11/10/2020 3:19:38PM

Sample Summary

| <u>Client Sample ID</u> | <u>Lab Sample ID</u> | <u>Collected</u> | <u>Received</u> | <u>Matrix</u> |
|-------------------------|----------------------|------------------|-----------------|-------------------------------|
| 104564-KBP | 1205868001 | 10/21/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |
| 104564-HEN | 1205868002 | 10/21/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |
| 104564-CAMP | 1205868003 | 10/21/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |
| 104564-CAMP2 | 1205868004 | 10/21/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |
| 104564-SWAN | 1205868005 | 10/21/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |
| 104564-B9MW | 1205868006 | 10/21/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |
| 104564-B5MW | 1205868007 | 10/22/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |
| 104564-B4MW | 1205868008 | 10/22/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |
| 104564-B14MW | 1205868009 | 10/22/2020 | 10/22/2020 | Water (Surface, Eff., Ground) |

Method

Method Description

Profile 365500 JV

CHAIN OF CUSTODY

Shannon & Wilson, Inc.
 5430 Fairbanks Street, Suite 3
 Anchorage, Alaska 99518
 (907) 561-2120
 Fax (206) 695-6777

PFAS- EPA Method 537M

PFAS- EPA Method 537M

250 ml
HDPE-
Trizma

125 ml
HDPE-
4C

| Date | Time | Sample ID | Total Containers | 250 ml HDPE- Trizma | 125 ml HDPE- 4C |
|------------|-------|--------------|------------------|---------------------|-----------------|
| 10/21/2020 | 12:30 | 104564-KBP | 2 | X | |
| 10/21/2020 | 12:57 | 104564-HEN | 2 | X | |
| 10/21/2020 | 13:22 | 104564-CAMP | 2 | X | |
| 10/21/2020 | 13:37 | 104564-CAMP2 | 2 | X | |
| 10/21/2020 | 13:47 | 104564-SWAN | 2 | X | |
| 10/21/2020 | 15:50 | 104564-B9MW | 1 | | X |
| 10/22/2020 | 10:37 | 104564-B5MW | 1 | | X |
| 10/22/2020 | 11:50 | 104564-B4MW | 1 | | X |
| 10/22/2020 | 12:05 | 104564-B14MW | 1 | | X |

1205868



1 AB
2 AB
3 AB
4 AB
5 AB
6 A
7 A
8 A
9 A

Relinquished By:

Signature: *[Signature]* Date: 10/22/20
 Print Name: Alex Rizzo Time: 1610
 Company: Shannon & Wilson, Inc.

Received By:

Signature: _____ Date: _____
 Print Name: _____ Time: _____
 Company: _____

Relinquished By:

Signature: _____ Date: _____
 Print Name: _____ Time: _____
 Company: Shannon & Wilson, Inc.

Project Information

Project Number: 104564 Contact: Dan McMahon
 Project Name: UAA KPC Sampler: AJR
 Special Instructions:

Received By:

Signature: *[Signature]* Date: 10/22/20
 Print Name: Ryan Conlon Time: 1614
 Company: SCS

Sample Receipt

Temp Blank: 2.7 DSP Sample Matrix: Drinking water/groundwater
 Cooler Temperature Upon Arrival:
 Standard TAT

HD Absent

365300 SA



e-Sample Receipt Form

SGS Workorder #:

1205868



1 2 0 5 8 6 8

| Review Criteria | Condition (Yes, No, N/A) | Exceptions Noted below |
|---|--------------------------|--------------------------------------|
| Chain of Custody / Temperature Requirements | | |
| Were Custody Seals intact? Note # & location | N/A | absent |
| COC accompanied samples? | Yes | |
| DOD: Were samples received in COC corresponding coolers? | N/A | |
| <input type="checkbox"/> N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required | | |
| Temperature blank compliant* (i.e., 0-6 °C after CF)? | Yes | Cooler ID: 1 @ 2.7 °C Therm. ID: D58 |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| | | Cooler ID: @ °C Therm. ID: |
| *If >6°C, were samples collected <8 hours ago? <input type="checkbox"/> N/A | | |
| If <0°C, were sample containers ice free? <input type="checkbox"/> N/A | | |
| Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed. | | |
| Holding Time / Documentation / Sample Condition Requirements | | |
| Note: Refer to form F-083 "Sample Guide" for specific holding times. | | |
| Were samples received within holding time? | Yes | |
| Do samples match COC** (i.e., sample IDs, dates/times collected)? | Yes | |
| **Note: If times differ <1hr, record details & login per COC. ***Note: If sample information on containers differs from COC, SGS will default to COC information | | |
| Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)) | Yes | |
| <input type="checkbox"/> N/A ***Exemption permitted for metals (e.g,200.8/6020A). | | |
| Were proper containers (type/mass/volume/preservative***)used? | Yes | |
| Volatile / LL-Hg Requirements | | |
| Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? | N/A | |
| Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? | N/A | |
| Were all soil VOAs field extracted with MeOH+BFB? | N/A | |
| Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. | | |
| Additional notes (if applicable): | | |
| | | |



Sample Containers and Preservatives

| <u>Container Id</u> | <u>Preservative</u> | <u>Container Condition</u> | <u>Container Id</u> | <u>Preservative</u> | <u>Container Condition</u> |
|---------------------|--------------------------|----------------------------|---------------------|---------------------|----------------------------|
| 1205868001-A | No Preservative Required | OK | | | |
| 1205868001-B | No Preservative Required | OK | | | |
| 1205868002-A | No Preservative Required | OK | | | |
| 1205868002-B | No Preservative Required | OK | | | |
| 1205868003-A | No Preservative Required | OK | | | |
| 1205868003-B | No Preservative Required | OK | | | |
| 1205868004-A | No Preservative Required | OK | | | |
| 1205868004-B | No Preservative Required | OK | | | |
| 1205868005-A | No Preservative Required | OK | | | |
| 1205868005-B | No Preservative Required | OK | | | |
| 1205868006-A | No Preservative Required | OK | | | |
| 1205868007-A | No Preservative Required | OK | | | |
| 1205868008-A | No Preservative Required | OK | | | |
| 1205868009-A | No Preservative Required | OK | | | |

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

QN - Insufficient sample quantity provided.

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

SGS North America, Inc

1205868

SGS Job Number: FA80194

Sampling Dates: 10/21/20 - 10/22/20

Report to:

**SGS North America, Inc
200 W Potter Dr
Anchorage, AK 99518
julie.shumway@sgs.com**

ATTN: Julie Shumway

Total number of pages in report: 39



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in black ink, appearing to read "Norm Farmer".

Norm Farmer
Technical Director

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.

Test results relate only to samples analyzed.

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Sample Summary

SGS North America, Inc
1205868

Job No: FA80194

| Sample Number | Collected Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---------------|----------------|---------|----------|-------------|------|------------------|
|---------------|----------------|---------|----------|-------------|------|------------------|

This report contains results reported as ND = Not detected. The following applies:
Organics ND = Not detected above the RL

| | | | | | | |
|-----------|----------|-------|----------|----|-------|--------------|
| FA80194-1 | 10/21/20 | 12:30 | 10/27/20 | AQ | Water | 104564-KBP |
| FA80194-2 | 10/21/20 | 12:57 | 10/27/20 | AQ | Water | 104564-HEN |
| FA80194-3 | 10/21/20 | 13:22 | 10/27/20 | AQ | Water | 104564-CAMP |
| FA80194-4 | 10/21/20 | 13:37 | 10/27/20 | AQ | Water | 104564-CAMP2 |
| FA80194-5 | 10/21/20 | 13:47 | 10/27/20 | AQ | Water | 104564-SWAN |
| FA80194-6 | 10/21/20 | 15:50 | 10/27/20 | AQ | Water | 104564-B9MW |
| FA80194-7 | 10/22/20 | 10:37 | 10/27/20 | AQ | Water | 104564-B5MW |
| FA80194-8 | 10/22/20 | 11:50 | 10/27/20 | AQ | Water | 104564-B4MW |
| FA80194-9 | 10/22/20 | 12:05 | 10/27/20 | AQ | Water | 104564-B14MW |

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: SGS North America, Inc

Job No: FA80194

Site: 1205868

Report Date 11/10/2020 1:52:45

9 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were collected on between 10/21/2020 and 10/22/2020 and were received at SGS North America Inc - Orlando on 10/27/2020 properly preserved, at 4.2 Deg. C and intact. These Samples received an SGS Orlando job number of FA80194. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

MS Semi-volatiles By Method EPA 537M BY ID

Matrix: AQ

Batch ID: OP82752

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) JD15288-2MS, JD15288-2MSD were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Ariel Hartney, Client Services (*Signature on File*)

Summary of Hits

Job Number: FA80194
Account: SGS North America, Inc
Project: 1205868
Collected: 10/21/20 thru 10/22/20



| Lab Sample ID | Client Sample ID | Result/ Qual | RL | MDL | Units | Method |
|---------------|------------------|-----------------|----|-----|-------|--------|
|---------------|------------------|-----------------|----|-----|-------|--------|

FA80194-1 104564-KBP

No hits reported in this sample.

FA80194-2 104564-HEN

No hits reported in this sample.

FA80194-3 104564-CAMP

| | | | | |
|------------------------------|--------|--------|------|----------------|
| Perfluorohexanoic acid | 0.0048 | 0.0036 | ug/l | EPA 537M BY ID |
| Perfluorooctanoic acid | 0.0210 | 0.0036 | ug/l | EPA 537M BY ID |
| Perfluorohexanesulfonic acid | 0.0259 | 0.0036 | ug/l | EPA 537M BY ID |

FA80194-4 104564-CAMP2

| | | | | |
|------------------------------|--------|--------|------|----------------|
| Perfluorohexanoic acid | 0.0048 | 0.0036 | ug/l | EPA 537M BY ID |
| Perfluorooctanoic acid | 0.0204 | 0.0036 | ug/l | EPA 537M BY ID |
| Perfluorohexanesulfonic acid | 0.0266 | 0.0036 | ug/l | EPA 537M BY ID |

FA80194-5 104564-SWAN

No hits reported in this sample.

FA80194-6 104564-B9MW

| | | | | |
|------------------------------|--------|--------|------|----------------|
| Perfluorooctanoic acid | 0.0122 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluorohexanesulfonic acid | 0.0171 | 0.0083 | ug/l | EPA 537M BY ID |

FA80194-7 104564-B5MW

| | | | | |
|-------------------------------|--------|--------|------|----------------|
| Perfluorobutanoic acid | 0.0778 | 0.017 | ug/l | EPA 537M BY ID |
| Perfluoropentanoic acid | 0.292 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluorohexanoic acid | 0.230 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluoroheptanoic acid | 0.241 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluorooctanoic acid | 0.121 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluorononanoic acid | 0.0859 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluorodecanoic acid | 0.0176 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluoroundecanoic acid | 1.09 | 0.017 | ug/l | EPA 537M BY ID |
| Perfluorotridecanoic acid | 0.0227 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluorobutanesulfonic acid | 0.0135 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluoropentanesulfonic acid | 0.0216 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluorohexanesulfonic acid | 0.312 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluoroheptanesulfonic acid | 0.0147 | 0.0083 | ug/l | EPA 537M BY ID |
| Perfluorooctanesulfonic acid | 0.429 | 0.0083 | ug/l | EPA 537M BY ID |

Summary of Hits

Job Number: FA80194
Account: SGS North America, Inc
Project: 1205868
Collected: 10/21/20 thru 10/22/20



| Lab Sample ID | Client Sample ID | Result/ Qual | RL | MDL | Units | Method |
|---------------|------------------|-----------------|----|-----|-------|--------|
|---------------|------------------|-----------------|----|-----|-------|--------|

| | | | | | | |
|-----------------------------|--|-------|-------|--|------|----------------|
| 6:2 Fluorotelomer sulfonate | | 0.181 | 0.017 | | ug/l | EPA 537M BY ID |
| 8:2 Fluorotelomer sulfonate | | 0.238 | 0.017 | | ug/l | EPA 537M BY ID |

FA80194-8 104564-B4MW

| | | | | | |
|-------------------------------|--------|--------|--|------|----------------|
| Perfluorobutanoic acid | 0.0676 | 0.017 | | ug/l | EPA 537M BY ID |
| Perfluoropentanoic acid | 0.275 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorohexanoic acid | 0.292 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluoroheptanoic acid | 0.295 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorooctanoic acid | 0.331 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorononanoic acid | 0.633 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorodecanoic acid | 0.0196 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluoroundecanoic acid | 0.242 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorotridecanoic acid | 0.0105 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorobutanesulfonic acid | 0.0179 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluoropentanesulfonic acid | 0.0326 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorohexanesulfonic acid | 0.520 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluoroheptanesulfonic acid | 0.0441 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorooctanesulfonic acid | 1.96 | 0.042 | | ug/l | EPA 537M BY ID |
| 6:2 Fluorotelomer sulfonate | 0.333 | 0.017 | | ug/l | EPA 537M BY ID |
| 8:2 Fluorotelomer sulfonate | 0.252 | 0.017 | | ug/l | EPA 537M BY ID |

FA80194-9 104564-B14MW

| | | | | | |
|-------------------------------|--------|--------|--|------|----------------|
| Perfluorobutanoic acid | 0.0667 | 0.017 | | ug/l | EPA 537M BY ID |
| Perfluoropentanoic acid | 0.271 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorohexanoic acid | 0.271 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluoroheptanoic acid | 0.294 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorooctanoic acid | 0.336 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorononanoic acid | 0.594 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorodecanoic acid | 0.0183 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluoroundecanoic acid | 0.249 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorotridecanoic acid | 0.0101 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorobutanesulfonic acid | 0.0178 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluoropentanesulfonic acid | 0.0300 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorohexanesulfonic acid | 0.540 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluoroheptanesulfonic acid | 0.0468 | 0.0083 | | ug/l | EPA 537M BY ID |
| Perfluorooctanesulfonic acid | 1.87 | 0.042 | | ug/l | EPA 537M BY ID |
| 6:2 Fluorotelomer sulfonate | 0.330 | 0.017 | | ug/l | EPA 537M BY ID |
| 8:2 Fluorotelomer sulfonate | 0.240 | 0.017 | | ug/l | EPA 537M BY ID |

Sample Results

Report of Analysis

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-KBP | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-1 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7514.D | 1 | 11/01/20 15:10 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | | | | | | | |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 280 ml | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------|--------|----|-------|---|
|---------|----------|--------|----|-------|---|

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|----|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | ND | 0.0071 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 0.0036 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | ND | 0.0036 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 0.0036 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | ND | 0.0036 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | ND | 0.0036 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | ND | 0.0036 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0036 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0036 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.0036 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0036 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|----|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 0.0036 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 0.0036 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 0.0036 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.0036 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0036 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0036 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0036 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0036 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0071 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.0071 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|----|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

| | | |
|---|--|--------------------------------|
| Client Sample ID: 104564-KBP | | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-1 | | Date Received: 10/27/20 |
| Matrix: AQ - Water | | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | | |
| Project: 1205868 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 76% | | 35-135% |
| | 13C5-PFPeA | 78% | | 50-150% |
| | 13C5-PFHxA | 80% | | 50-150% |
| | 13C4-PFHpA | 84% | | 50-150% |
| | 13C8-PFOA | 88% | | 50-150% |
| | 13C9-PFNA | 89% | | 50-150% |
| | 13C6-PFDA | 87% | | 50-150% |
| | 13C7-PFUnDA | 80% | | 40-140% |
| | 13C2-PFDoDA | 74% | | 40-140% |
| | 13C2-PFTeDA | 63% | | 30-130% |
| | 13C3-PFBS | 79% | | 50-150% |
| | 13C3-PFHxS | 82% | | 50-150% |
| | 13C8-PFOS | 85% | | 50-150% |
| | 13C8-FOSA | 50% | | 30-130% |
| | d3-MeFOSAA | 87% | | 50-150% |
| | d5-EtFOSAA | 81% | | 50-150% |
| | 13C2-4:2FTS | 80% | | 50-150% |
| | 13C2-6:2FTS | 88% | | 50-150% |
| | 13C2-8:2FTS | 82% | | 50-150% |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.1
4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-HEN | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-2 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7515.D | 1 | 11/01/20 15:25 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | | | | | | | |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 280 ml | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------|--------|----|-------|---|
|---------|----------|--------|----|-------|---|

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|----|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | ND | 0.0071 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 0.0036 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | ND | 0.0036 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 0.0036 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | ND | 0.0036 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | ND | 0.0036 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | ND | 0.0036 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0036 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0036 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.0036 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0036 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|----|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 0.0036 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 0.0036 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 0.0036 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.0036 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0036 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0036 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0036 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0036 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0071 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.0071 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|----|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.2
4

Report of Analysis

| | | |
|---|--|--------------------------------|
| Client Sample ID: 104564-HEN | | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-2 | | Date Received: 10/27/20 |
| Matrix: AQ - Water | | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | | |
| Project: 1205868 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 75% | | 35-135% |
| | 13C5-PFPeA | 80% | | 50-150% |
| | 13C5-PFHxA | 82% | | 50-150% |
| | 13C4-PFHpA | 86% | | 50-150% |
| | 13C8-PFOA | 89% | | 50-150% |
| | 13C9-PFNA | 89% | | 50-150% |
| | 13C6-PFDA | 91% | | 50-150% |
| | 13C7-PFUnDA | 80% | | 40-140% |
| | 13C2-PFDoDA | 73% | | 40-140% |
| | 13C2-PFTeDA | 40% | | 30-130% |
| | 13C3-PFBS | 79% | | 50-150% |
| | 13C3-PFHxS | 86% | | 50-150% |
| | 13C8-PFOS | 91% | | 50-150% |
| | 13C8-FOSA | 62% | | 30-130% |
| | d3-MeFOSAA | 87% | | 50-150% |
| | d5-EtFOSAA | 82% | | 50-150% |
| | 13C2-4:2FTS | 82% | | 50-150% |
| | 13C2-6:2FTS | 87% | | 50-150% |
| | 13C2-8:2FTS | 83% | | 50-150% |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.2
4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-CAMP | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-3 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7516.D | 1 | 11/01/20 15:41 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | | | | | | | |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 280 ml | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------|--------|----|-------|---|
|---------|----------|--------|----|-------|---|

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|--------|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | ND | 0.0071 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 0.0036 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | 0.0048 | 0.0036 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 0.0036 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | 0.0210 | 0.0036 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | ND | 0.0036 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | ND | 0.0036 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0036 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0036 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.0036 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0036 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|--------|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 0.0036 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 0.0036 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0259 | 0.0036 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.0036 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0036 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0036 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0036 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0036 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0071 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.0071 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|----|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

| | |
|---|--|
| ND = Not detected | J = Indicates an estimated value |
| RL = Reporting Limit | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range | N = Indicates presumptive evidence of a compound |

4.3
4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-CAMP | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-3 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 90% | | 35-135% |
| | 13C5-PFPeA | 91% | | 50-150% |
| | 13C5-PFHxA | 95% | | 50-150% |
| | 13C4-PFHpA | 97% | | 50-150% |
| | 13C8-PFOA | 95% | | 50-150% |
| | 13C9-PFNA | 100% | | 50-150% |
| | 13C6-PFDA | 98% | | 50-150% |
| | 13C7-PFUnDA | 94% | | 40-140% |
| | 13C2-PFDoDA | 89% | | 40-140% |
| | 13C2-PFTeDA | 87% | | 30-130% |
| | 13C3-PFBS | 90% | | 50-150% |
| | 13C3-PFHxS | 96% | | 50-150% |
| | 13C8-PFOS | 95% | | 50-150% |
| | 13C8-FOSA | 99% | | 30-130% |
| | d3-MeFOSAA | 97% | | 50-150% |
| | d5-EtFOSAA | 92% | | 50-150% |
| | 13C2-4:2FTS | 91% | | 50-150% |
| | 13C2-6:2FTS | 96% | | 50-150% |
| | 13C2-8:2FTS | 91% | | 50-150% |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.3
4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-CAMP2 | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-4 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7517.D | 1 | 11/01/20 15:56 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | | | | | | | |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 280 ml | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------|--------|----|-------|---|
|---------|----------|--------|----|-------|---|

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|--------|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | ND | 0.0071 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 0.0036 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | 0.0048 | 0.0036 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 0.0036 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | 0.0204 | 0.0036 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | ND | 0.0036 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | ND | 0.0036 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0036 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0036 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.0036 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0036 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|--------|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 0.0036 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 0.0036 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0266 | 0.0036 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.0036 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0036 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0036 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0036 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0036 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0071 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.0071 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|----|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

| | |
|---|--|
| ND = Not detected | J = Indicates an estimated value |
| RL = Reporting Limit | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range | N = Indicates presumptive evidence of a compound |

4.4
4

Report of Analysis

| | | |
|---|--|--------------------------------|
| Client Sample ID: 104564-CAMP2 | | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-4 | | Date Received: 10/27/20 |
| Matrix: AQ - Water | | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | | |
| Project: 1205868 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 88% | | 35-135% |
| | 13C5-PFPeA | 90% | | 50-150% |
| | 13C5-PFHxA | 94% | | 50-150% |
| | 13C4-PFHpA | 96% | | 50-150% |
| | 13C8-PFOA | 96% | | 50-150% |
| | 13C9-PFNA | 98% | | 50-150% |
| | 13C6-PFDA | 99% | | 50-150% |
| | 13C7-PFUnDA | 93% | | 40-140% |
| | 13C2-PFDoDA | 90% | | 40-140% |
| | 13C2-PFTeDA | 89% | | 30-130% |
| | 13C3-PFBS | 87% | | 50-150% |
| | 13C3-PFHxS | 93% | | 50-150% |
| | 13C8-PFOS | 90% | | 50-150% |
| | 13C8-FOSA | 97% | | 30-130% |
| | d3-MeFOSAA | 101% | | 50-150% |
| | d5-EtFOSAA | 90% | | 50-150% |
| | 13C2-4:2FTS | 88% | | 50-150% |
| | 13C2-6:2FTS | 94% | | 50-150% |
| | 13C2-8:2FTS | 88% | | 50-150% |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.4
 4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-SWAN | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-5 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7518.D | 1 | 11/01/20 16:12 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | | | | | | | |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 280 ml | 1.0 ml |
| Run #2 | | |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------|--------|----|-------|---|
|---------|----------|--------|----|-------|---|

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|----|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | ND | 0.0071 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 0.0036 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | ND | 0.0036 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 0.0036 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | ND | 0.0036 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | ND | 0.0036 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | ND | 0.0036 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0036 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0036 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.0036 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0036 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|----|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 0.0036 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 0.0036 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 0.0036 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.0036 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0036 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0036 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0036 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0036 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0071 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.0071 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|----|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.5
4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-SWAN | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-5 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

4.5
4

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.0071 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 91% | | 35-135% |
| | 13C5-PFPeA | 91% | | 50-150% |
| | 13C5-PFHxA | 94% | | 50-150% |
| | 13C4-PFHpA | 94% | | 50-150% |
| | 13C8-PFOA | 94% | | 50-150% |
| | 13C9-PFNA | 97% | | 50-150% |
| | 13C6-PFDA | 95% | | 50-150% |
| | 13C7-PFUnDA | 91% | | 40-140% |
| | 13C2-PFDoDA | 87% | | 40-140% |
| | 13C2-PFTeDA | 68% | | 30-130% |
| | 13C3-PFBS | 86% | | 50-150% |
| | 13C3-PFHxS | 93% | | 50-150% |
| | 13C8-PFOS | 90% | | 50-150% |
| | 13C8-FOSA | 94% | | 30-130% |
| | d3-MeFOSAA | 98% | | 50-150% |
| | d5-EtFOSAA | 87% | | 50-150% |
| | 13C2-4:2FTS | 90% | | 50-150% |
| | 13C2-6:2FTS | 93% | | 50-150% |
| | 13C2-8:2FTS | 88% | | 50-150% |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-B9MW | |
| Lab Sample ID: FA80194-6 | Date Sampled: 10/21/20 |
| Matrix: AQ - Water | Date Received: 10/27/20 |
| Method: EPA 537M BY ID EPA 537 MOD | Percent Solids: n/a |
| Project: 1205868 | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7519.D | 1 | 11/01/20 16:27 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | | | | | | | |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 120 ml | 1.0 ml |
| Run #2 | | |

CAS No. Compound Result RL Units Q

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|--------|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | ND | 0.017 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 0.0083 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | ND | 0.0083 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 0.0083 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | 0.0122 | 0.0083 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | ND | 0.0083 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | ND | 0.0083 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0083 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0083 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.0083 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0083 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|--------|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 0.0083 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 0.0083 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0171 | 0.0083 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.0083 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0083 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0083 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0083 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0083 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|-------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.017 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.017 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|----|-------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.017 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 0.017 | ug/l | |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.6
 4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-B9MW | Date Sampled: 10/21/20 |
| Lab Sample ID: FA80194-6 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

4.6
4

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|-------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.017 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 96% | | 35-135% |
| | 13C5-PFPeA | 98% | | 50-150% |
| | 13C5-PFHxA | 99% | | 50-150% |
| | 13C4-PFHpA | 104% | | 50-150% |
| | 13C8-PFOA | 104% | | 50-150% |
| | 13C9-PFNA | 105% | | 50-150% |
| | 13C6-PFDA | 104% | | 50-150% |
| | 13C7-PFUnDA | 100% | | 40-140% |
| | 13C2-PFDoDA | 103% | | 40-140% |
| | 13C2-PFTeDA | 99% | | 30-130% |
| | 13C3-PFBS | 94% | | 50-150% |
| | 13C3-PFHxS | 98% | | 50-150% |
| | 13C8-PFOS | 105% | | 50-150% |
| | 13C8-FOSA | 100% | | 30-130% |
| | d3-MeFOSAA | 110% | | 50-150% |
| | d5-EtFOSAA | 102% | | 50-150% |
| | 13C2-4:2FTS | 97% | | 50-150% |
| | 13C2-6:2FTS | 101% | | 50-150% |
| | 13C2-8:2FTS | 99% | | 50-150% |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-B5MW | |
| Lab Sample ID: FA80194-7 | Date Sampled: 10/22/20 |
| Matrix: AQ - Water | Date Received: 10/27/20 |
| Method: EPA 537M BY ID EPA 537 MOD | Percent Solids: n/a |
| Project: 1205868 | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7520.D | 1 | 11/01/20 16:42 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | 2Q57201.D | 2 | 11/02/20 14:47 | NAF | 10/30/20 08:30 | OP82752 | S2Q845 |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 120 ml | 1.0 ml |
| Run #2 | 120 ml | 1.0 ml |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------|--------|----|-------|---|
|---------|----------|--------|----|-------|---|

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|-------------------|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | 0.0778 | 0.017 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | 0.292 | 0.0083 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | 0.230 | 0.0083 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | 0.241 | 0.0083 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | 0.121 | 0.0083 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | 0.0859 | 0.0083 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | 0.0176 | 0.0083 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | 1.09 ^a | 0.017 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0083 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0227 | 0.0083 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0083 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|--------|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0135 | 0.0083 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0216 | 0.0083 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.312 | 0.0083 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0147 | 0.0083 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.429 | 0.0083 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0083 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0083 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0083 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|-------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.017 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.017 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|-------|-------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.017 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.181 | 0.017 | ug/l | |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.7
 4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-B5MW | Date Sampled: 10/22/20 |
| Lab Sample ID: FA80194-7 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|-------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.238 | 0.017 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 89% | 91% | 35-135% |
| | 13C5-PFPeA | 91% | 86% | 50-150% |
| | 13C5-PFHxA | 95% | 87% | 50-150% |
| | 13C4-PFHpA | 97% | 84% | 50-150% |
| | 13C8-PFOA | 98% | 90% | 50-150% |
| | 13C9-PFNA | 102% | 90% | 50-150% |
| | 13C6-PFDA | 101% | 92% | 50-150% |
| | 13C7-PFUnDA | 92% | 88% | 40-140% |
| | 13C2-PFDoDA | 97% | 89% | 40-140% |
| | 13C2-PFTeDA | 96% | 90% | 30-130% |
| | 13C3-PFBS | 91% | 90% | 50-150% |
| | 13C3-PFHxS | 98% | 92% | 50-150% |
| | 13C8-PFOS | 91% | 93% | 50-150% |
| | 13C8-FOSA | 87% | 86% | 30-130% |
| | d3-MeFOSAA | 104% | 116% | 50-150% |
| | d5-EtFOSAA | 101% | 121% | 50-150% |
| | 13C2-4:2FTS | 91% | 87% | 50-150% |
| | 13C2-6:2FTS | 102% | 94% | 50-150% |
| | 13C2-8:2FTS | 107% | 97% | 50-150% |

(a) Result is from Run# 2

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

4.7
4

Report of Analysis

| | | |
|---|--|--------------------------------|
| Client Sample ID: 104564-B4MW | | |
| Lab Sample ID: FA80194-8 | | Date Sampled: 10/22/20 |
| Matrix: AQ - Water | | Date Received: 10/27/20 |
| Method: EPA 537M BY ID EPA 537 MOD | | Percent Solids: n/a |
| Project: 1205868 | | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7521.D | 1 | 11/01/20 16:58 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | 2Q57202.D | 5 | 11/02/20 15:02 | NAF | 10/30/20 08:30 | OP82752 | S2Q845 |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 120 ml | 1.0 ml |
| Run #2 | 120 ml | 1.0 ml |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------|--------|----|-------|---|
|---------|----------|--------|----|-------|---|

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|--------|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | 0.0676 | 0.017 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | 0.275 | 0.0083 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | 0.292 | 0.0083 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | 0.295 | 0.0083 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | 0.331 | 0.0083 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | 0.633 | 0.0083 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | 0.0196 | 0.0083 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.242 | 0.0083 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0083 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0105 | 0.0083 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0083 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|-------------------|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0179 | 0.0083 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0326 | 0.0083 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.520 | 0.0083 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0441 | 0.0083 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 1.96 ^a | 0.042 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0083 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0083 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0083 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|-------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.017 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.017 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|-------|-------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.017 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.333 | 0.017 | ug/l | |

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-B4MW | Date Sampled: 10/22/20 |
| Lab Sample ID: FA80194-8 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|-------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.252 | 0.017 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 84% | 97% | 35-135% |
| | 13C5-PFPeA | 89% | 92% | 50-150% |
| | 13C5-PFHxA | 91% | 91% | 50-150% |
| | 13C4-PFHpA | 97% | 88% | 50-150% |
| | 13C8-PFOA | 99% | 93% | 50-150% |
| | 13C9-PFNA | 92% | 91% | 50-150% |
| | 13C6-PFDA | 103% | 93% | 50-150% |
| | 13C7-PFUnDA | 98% | 89% | 40-140% |
| | 13C2-PFDoDA | 96% | 89% | 40-140% |
| | 13C2-PFTeDA | 95% | 90% | 30-130% |
| | 13C3-PFBS | 88% | 96% | 50-150% |
| | 13C3-PFHxS | 100% | 96% | 50-150% |
| | 13C8-PFOS | 94% | 93% | 50-150% |
| | 13C8-FOSA | 84% | 90% | 30-130% |
| | d3-MeFOSAA | 108% | 124% | 50-150% |
| | d5-EtFOSAA | 106% | 127% | 50-150% |
| | 13C2-4:2FTS | 94% | 91% | 50-150% |
| | 13C2-6:2FTS | 111% | 103% | 50-150% |
| | 13C2-8:2FTS | 107% | 101% | 50-150% |

(a) Result is from Run# 2

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

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4

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-B14MW | |
| Lab Sample ID: FA80194-9 | Date Sampled: 10/22/20 |
| Matrix: AQ - Water | Date Received: 10/27/20 |
| Method: EPA 537M BY ID EPA 537 MOD | Percent Solids: n/a |
| Project: 1205868 | |

| Run # | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q7524.D | 1 | 11/01/20 17:44 | NAF | 10/30/20 08:30 | OP82752 | S4Q104 |
| Run #2 | 2Q57203.D | 5 | 11/02/20 15:17 | NAF | 10/30/20 08:30 | OP82752 | S2Q845 |

| Run # | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 120 ml | 1.0 ml |
| Run #2 | 120 ml | 1.0 ml |

| CAS No. | Compound | Result | RL | Units | Q |
|---------|----------|--------|----|-------|---|
|---------|----------|--------|----|-------|---|

PERFLUOROALKYL CARBOXYLIC ACIDS

| | | | | | |
|------------|-----------------------------|--------|--------|------|--|
| 375-22-4 | Perfluorobutanoic acid | 0.0667 | 0.017 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | 0.271 | 0.0083 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | 0.271 | 0.0083 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | 0.294 | 0.0083 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | 0.336 | 0.0083 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | 0.594 | 0.0083 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | 0.0183 | 0.0083 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | 0.249 | 0.0083 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0083 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | 0.0101 | 0.0083 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0083 | ug/l | |

PERFLUOROALKYL SULFONIC ACIDS

| | | | | | |
|------------|-------------------------------|-------------------|--------|------|--|
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0178 | 0.0083 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0300 | 0.0083 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.540 | 0.0083 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.0468 | 0.0083 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | 1.87 ^a | 0.042 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0083 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0083 | ug/l | |

PERFLUORO OCTANESULFONAMIDES

| | | | | | |
|----------|-------|----|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0083 | ug/l | |
|----------|-------|----|--------|------|--|

PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

| | | | | | |
|-----------|---------|----|-------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.017 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.017 | ug/l | |

FLUOROTELOMER SULFONATES

| | | | | | |
|-------------|-----------------------------|-------|-------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.017 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.330 | 0.017 | ug/l | |

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

| | |
|---|--------------------------------|
| Client Sample ID: 104564-B14MW | Date Sampled: 10/22/20 |
| Lab Sample ID: FA80194-9 | Date Received: 10/27/20 |
| Matrix: AQ - Water | Percent Solids: n/a |
| Method: EPA 537M BY ID EPA 537 MOD | |
| Project: 1205868 | |

| CAS No. | Compound | Result | RL | Units | Q |
|------------|-----------------------------|--------|-------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.240 | 0.017 | ug/l | |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits |
|---------|------------------------|--------|--------|---------|
| | 13C4-PFBA | 81% | 92% | 35-135% |
| | 13C5-PFPeA | 83% | 87% | 50-150% |
| | 13C5-PFHxA | 90% | 85% | 50-150% |
| | 13C4-PFHpA | 88% | 82% | 50-150% |
| | 13C8-PFOA | 90% | 87% | 50-150% |
| | 13C9-PFNA | 89% | 83% | 50-150% |
| | 13C6-PFDA | 95% | 86% | 50-150% |
| | 13C7-PFUnDA | 89% | 82% | 40-140% |
| | 13C2-PFDoDA | 91% | 84% | 40-140% |
| | 13C2-PFTeDA | 89% | 85% | 30-130% |
| | 13C3-PFBS | 83% | 88% | 50-150% |
| | 13C3-PFHxS | 85% | 90% | 50-150% |
| | 13C8-PFOS | 87% | 88% | 50-150% |
| | 13C8-FOSA | 80% | 86% | 30-130% |
| | d3-MeFOSAA | 100% | 114% | 50-150% |
| | d5-EtFOSAA | 98% | 117% | 50-150% |
| | 13C2-4:2FTS | 85% | 84% | 50-150% |
| | 13C2-6:2FTS | 103% | 96% | 50-150% |
| | 13C2-8:2FTS | 100% | 93% | 50-150% |

(a) Result is from Run# 2

ND = Not detected
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

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Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

Parameter Certification Exceptions

Job Number: FA80194
Account: SGS/KA SGS North America, Inc
Project: 1205868

The following parameters included in this report are exceptions to NELAC certification.
The certification status of each is indicated below.

| Parameter | CAS# | Method | Mat | Certification Status |
|-------------------------------|-------------|----------------|-----|------------------------|
| 4:2 Fluorotelomer sulfonate | 757124-72-4 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| 6:2 Fluorotelomer sulfonate | 27619-97-2 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| 8:2 Fluorotelomer sulfonate | 39108-34-4 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| EtFOSAA | 2991-50-6 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| MeFOSAA | 2355-31-9 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| PFOSA | 754-91-6 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorobutanesulfonic acid | 375-73-5 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorobutanoic acid | 375-22-4 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorodecanesulfonic acid | 335-77-3 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorodecanoic acid | 335-76-2 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorododecanoic acid | 307-55-1 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluoroheptanesulfonic acid | 375-92-8 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluoroheptanoic acid | 375-85-9 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorohexanesulfonic acid | 355-46-4 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorohexanoic acid | 307-24-4 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorononanesulfonic acid | 68259-12-1 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorononanoic acid | 375-95-1 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorooctanesulfonic acid | 1763-23-1 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorooctanoic acid | 335-67-1 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluoropentanesulfonic acid | 2706-91-4 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluoropentanoic acid | 2706-90-3 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorotetradecanoic acid | 376-06-7 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluorotridecanoic acid | 72629-94-8 | EPA 537M BY ID | AQ | Certified by SOP MS014 |
| Perfluoroundecanoic acid | 2058-94-8 | EPA 537M BY ID | AQ | Certified by SOP MS014 |

5.1
5

FA80194

SGS North America Inc.
CHAIN OF CUSTODY RECORD



Locations Nationwide
Alaska Florida
New Jersey Colorado
Texas North Carolina
Virginia Louisiana
www.us.sgs.com

| | | | | | | | | | | | |
|--|--------------|-------------------------------|----------|--|-------------------------|-----------------------------------|---------------------------------|--|-----|------------|-------------|
| CLIENT: SGS North America Inc. - Alaska Division | | | | SGS Reference: SGS Orlando, FL | | | | Page 1 of 1 | | | |
| CONTACT: Julie Shumway | | PHONE NO: (907) 562-2343 | | Additional Comments: All soils report out in dry weight unless | | | | | | | |
| PROJECT NAME: 1205868 | | PWSID#: NPDL#: | | CONTAINER | Preservative Used: NONE | EPA 537.1 PFAS - 24 Compound List | EPA 537 PFAS - 24 Compound List | MS | MSD | SGS lab # | Location ID |
| REPORTS TO: Julie Shumway | | E-MAIL: Julie.Shumway@sgs.com | | | | | | | | | |
| INVOICE TO: SGS - Alaska | | QUOTE #: P.O. #: 1205868 | | | | | | | | | |
| RESERVED for lab use | | SAMPLE IDENTIFICATION | | | | | | | | | |
| 1 | 104564-KBP | 10/21/2020 | 12:30:00 | DW | 2 | X | | | | 1205868001 | |
| 2 | 104564-HEN | 10/21/2020 | 12:57:00 | DW | 2 | X | | | | 1205868002 | |
| 3 | 104564-CAMP | 10/21/2020 | 13:22:00 | DW | 2 | X | | | | 1205868003 | |
| 4 | 104564-CAMP2 | 10/21/2020 | 13:37:00 | DW | 2 | X | | | | 1205868004 | |
| 5 | 104564-SWAN | 10/21/2020 | 13:47:00 | DW | 2 | X | | | | 1205868005 | |
| 6 | 104564-B9MW | 10/21/2020 | 15:50:00 | Water | 1 | | X | | | 1205868006 | |
| 7 | 104564-B5MW | 10/22/2020 | 10:37:00 | Water | 1 | | X | | | 1205868007 | |
| 8 | 104564-B4MW | 10/22/2020 | 11:50:00 | Water | 1 | | X | | | 1205868008 | |
| 9 | 104564-B14MW | 10/22/2020 | 12:05:00 | Water | 1 | | X | | | 1205868009 | |
| Relinquished By: (1) | | Date | Time | Received By: | | DOD Project? | | Data Deliverable Requirements: | | | |
| | | 10/20/20 | 1030 | FX | | NO | | Level 2 + SGS EDD | | | |
| Relinquished By: (2) | | Date | Time | Received By: | | Cooler ID: | | Requested Turnaround Time and-or Special Instructions: | | | |
| FX | | 10/27/20 | 0915 | | | | | | | | |
| Relinquished By: (3) | | Date | Time | Received By: | | Temp Blank °C: | | Chain of Custody Seal: (Circle) | | | |
| | | | | | | 4.2 | | INTACT [] BROKEN [] ABSENT [] | | | |
| Relinquished By: (4) | | Date | Time | Received For Laboratory By: | | or Ambient [] | | | | | |
| | | | | | | | | | | | |

[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
 [] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms_and_conditions.htm

F088_COC_REF_LAB_20190411

INITIAL ASSESSMENT

AREA VERIFICATION

SGS Sample Receipt Summary

Job Number: FA80194

Client: ALASKA

Project: 1205868

Date / Time Received: 10/27/2020 9:15:00 AM

Delivery Method: FED EX

Airbill #s: _____

Therm ID: IR 1;

Therm CF: 0.2;

of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (4.0);

Cooler Temps (Corrected) °C: Cooler 1: (4.2);

Cooler Information

Y or N

- | | | |
|-----------------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Temp criteria achieved | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Cooler temp verification | <u>IR Gun</u> | |
| 5. Cooler media | <u>Ice (Bag)</u> | |

Sample Information

Y or N N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Sample labels present on bottles | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Samples preserved properly | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 3. Sufficient volume/containers recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Condition of sample | <u>Intact</u> | | |
| 5. Sample recvd within HT | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 6. Dates/Times/IDs on COC match Sample Label | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 7. VOCs have headspace | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 9. Compositing instructions clear | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Voa Soil Kits/Jars received past 48hrs? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. % Solids Jar received? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. Residual Chlorine Present? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Trip Blank Information

Y or N N/A

- | | | | |
|--------------------------------|--------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| | <u>W or S</u> | | <u>N/A</u> |
| 3. Type Of TB Received | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____
 Test Strip Lot #: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____
 Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: CARLOSD

Date: 10/27/2020 9:15:00 A

Reviewer: _____

Date: _____

FA80194: Chain of Custody

Page 2 of 2

5.2
5

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA80194
Account: SGS/SAK/SGS North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| OP82752-MB | 4Q7513.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA80194-1, FA80194-2, FA80194-3, FA80194-4, FA80194-5, FA80194-6, FA80194-7, FA80194-8, FA80194-9

| CAS No. | Compound | Result | RL | Units | Q |
|----------------|-------------------------------|--------|--------|-------|---|
| 375-22-4 | Perfluorobutanoic acid | ND | 0.0040 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 0.0020 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | ND | 0.0020 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 0.0020 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | ND | 0.0020 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | ND | 0.0020 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | ND | 0.0020 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0020 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0020 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.0020 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0020 | ug/l | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 0.0020 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 0.0020 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 0.0020 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.0020 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0020 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0020 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0020 | ug/l | |
| 754-91-6 | PFOSA | ND | 0.0040 | ug/l | |
| 2355-31-9 | MeFOSAA | ND | 0.0040 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.0040 | ug/l | |
| 757124-72-44:2 | Fluorotelomer sulfonate | ND | 0.0080 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0036 | 0.0080 | ug/l | J |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.0080 | ug/l | |

| CAS No. | ID Standard Recoveries | Limits |
|---------|------------------------|-------------|
| | 13C4-PFBA | 89% 35-135% |
| | 13C5-PFPeA | 92% 50-150% |
| | 13C5-PFHxA | 90% 50-150% |
| | 13C4-PFHpA | 92% 50-150% |
| | 13C8-PFOA | 95% 50-150% |
| | 13C9-PFNA | 96% 50-150% |
| | 13C6-PFDA | 95% 50-150% |
| | 13C7-PFUnDA | 89% 40-140% |

Method Blank Summary

Job Number: FA80194
Account: SGS/SAK North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| OP82752-MB | 4Q7513.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA80194-1, FA80194-2, FA80194-3, FA80194-4, FA80194-5, FA80194-6, FA80194-7, FA80194-8, FA80194-9

| CAS No. | ID Standard Recoveries | Limits |
|---------|------------------------|-------------|
| | 13C2-PFDoDA | 87% 40-140% |
| | 13C2-PFTeDA | 83% 30-130% |
| | 13C3-PFBS | 89% 50-150% |
| | 13C3-PFHxS | 92% 50-150% |
| | 13C8-PFOS | 89% 50-150% |
| | 13C8-FOSA | 90% 30-130% |
| | d3-MeFOSAA | 94% 50-150% |
| | d5-EtFOSAA | 89% 50-150% |
| | 13C2-4:2FTS | 89% 50-150% |
| | 13C2-6:2FTS | 89% 50-150% |
| | 13C2-8:2FTS | 88% 50-150% |

Instrument Blank

Job Number: FA80194
Account: SGS/SAK North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|-----|-----------|------------|------------------|
| S4Q104-IBLK | 4Q7508.D | 1 | 11/01/20 | NAF | n/a | n/a | S4Q104 |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA80194-1, FA80194-2, FA80194-3, FA80194-4, FA80194-5, FA80194-6, FA80194-7, FA80194-8, FA80194-9

| CAS No. | Compound | Result | RL | Units | Q |
|----------------|-------------------------------|--------|--------|-------|---|
| 375-22-4 | Perfluorobutanoic acid | ND | 0.0080 | ug/l | |
| 2706-90-3 | Perfluoropentanoic acid | ND | 0.0040 | ug/l | |
| 307-24-4 | Perfluorohexanoic acid | ND | 0.0040 | ug/l | |
| 375-85-9 | Perfluoroheptanoic acid | ND | 0.0040 | ug/l | |
| 335-67-1 | Perfluorooctanoic acid | ND | 0.0040 | ug/l | |
| 375-95-1 | Perfluorononanoic acid | ND | 0.0040 | ug/l | |
| 335-76-2 | Perfluorodecanoic acid | ND | 0.0040 | ug/l | |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0040 | ug/l | |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.0040 | ug/l | |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.0040 | ug/l | |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.0040 | ug/l | |
| 375-73-5 | Perfluorobutanesulfonic acid | ND | 0.0040 | ug/l | |
| 2706-91-4 | Perfluoropentanesulfonic acid | ND | 0.0040 | ug/l | |
| 355-46-4 | Perfluorohexanesulfonic acid | ND | 0.0040 | ug/l | |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.0040 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0040 | ug/l | |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.0040 | ug/l | |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.0040 | ug/l | |
| 754-91-6 | PFOSA | ND | 0.0040 | ug/l | |
| 2355-31-9 | MeFOSAA | ND | 0.0080 | ug/l | |
| 2991-50-6 | EtFOSAA | ND | 0.0080 | ug/l | |
| 757124-72-44:2 | Fluorotelomer sulfonate | ND | 0.0080 | ug/l | |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | ND | 0.0080 | ug/l | |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.0080 | ug/l | |

| CAS No. | ID Standard Recoveries | Limits |
|---------|------------------------|--------------|
| | 13C4-PFBA | 98% 50-150% |
| | 13C5-PFPeA | 100% 50-150% |
| | 13C5-PFHxA | 102% 50-150% |
| | 13C4-PFHpA | 100% 50-150% |
| | 13C8-PFOA | 106% 50-150% |
| | 13C9-PFNA | 99% 50-150% |
| | 13C6-PFDA | 102% 50-150% |
| | 13C7-PFUnDA | 102% 50-150% |

Instrument Blank

Job Number: FA80194
Account: SGS/SAK North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|-----|-----------|------------|------------------|
| S4Q104-IBLK | 4Q7508.D | 1 | 11/01/20 | NAF | n/a | n/a | S4Q104 |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA80194-1, FA80194-2, FA80194-3, FA80194-4, FA80194-5, FA80194-6, FA80194-7, FA80194-8, FA80194-9

| CAS No. | ID Standard Recoveries | Limits |
|---------|------------------------|--------------|
| | 13C2-PFDoDA | 100% 50-150% |
| | 13C2-PFTeDA | 102% 50-150% |
| | 13C3-PFBS | 101% 50-150% |
| | 13C3-PFHxS | 97% 50-150% |
| | 13C8-PFOS | 99% 50-150% |
| | 13C8-FOSA | 100% 50-150% |
| | d3-MeFOSAA | 107% 50-150% |
| | d5-EtFOSAA | 100% 50-150% |
| | 13C2-4:2FTS | 95% 50-150% |
| | 13C2-6:2FTS | 98% 50-150% |
| | 13C2-8:2FTS | 96% 50-150% |
| | 13C3-HFPO-DA | 96% 50-150% |

Instrument Blank

Job Number: FA80194
Account: SGS/SAK/SGS North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| S2Q845-IBLK | 2Q57185.D | 1 | 11/02/20 | NAF | n/a | n/a | S2Q845 |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA80194-7, FA80194-8, FA80194-9

| CAS No. | Compound | Result | RL | Units | Q |
|-----------|------------------------------|--------|--------|-------|---|
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.0040 | ug/l | |
| 1763-23-1 | Perfluorooctanesulfonic acid | ND | 0.0040 | ug/l | |

| CAS No. | ID Standard Recoveries | Limits |
|---------|--------------------------|--------------|
| | 13C4-PFBA | 104% 50-150% |
| | 13C5-PFPeA | 96% 50-150% |
| | 13C5-PFHxA | 95% 50-150% |
| | 13C4-PFHpA | 97% 50-150% |
| | 13C8-PFOA | 99% 50-150% |
| | 13C9-PFNA | 96% 50-150% |
| | 13C6-PFDA | 100% 50-150% |
| | 13C7-PFUnDA | 97% 50-150% |
| | 13C2-PFD _o DA | 97% 50-150% |
| | 13C2-PFTeDA | 95% 50-150% |
| | 13C3-PFBS | 99% 50-150% |
| | 13C3-PFHxS | 98% 50-150% |
| | 13C8-PFOS | 101% 50-150% |
| | 13C8-FOSA | 105% 50-150% |
| | d3-MeFOSAA | 119% 50-150% |
| | d5-EtFOSAA | 121% 50-150% |
| | 13C2-4:2FTS | 93% 50-150% |
| | 13C2-6:2FTS | 95% 50-150% |
| | 13C2-8:2FTS | 95% 50-150% |
| | 13C3-HFPO-DA | 118% 50-150% |

Blank Spike Summary

Job Number: FA80194
Account: SGS/SAK/SGS North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| OP82752-BS | 4Q7512.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA80194-1, FA80194-2, FA80194-3, FA80194-4, FA80194-5, FA80194-6, FA80194-7, FA80194-8, FA80194-9

| CAS No. | Compound | Spike ug/l | BSP ug/l | BSP % | Limits |
|----------------|-------------------------------|------------|----------|-------|--------|
| 375-22-4 | Perfluorobutanoic acid | 0.08 | 0.0838 | 105 | 70-130 |
| 2706-90-3 | Perfluoropentanoic acid | 0.08 | 0.0842 | 105 | 70-130 |
| 307-24-4 | Perfluorohexanoic acid | 0.08 | 0.0869 | 109 | 70-130 |
| 375-85-9 | Perfluoroheptanoic acid | 0.08 | 0.0843 | 105 | 70-130 |
| 335-67-1 | Perfluorooctanoic acid | 0.08 | 0.0878 | 110 | 70-130 |
| 375-95-1 | Perfluorononanoic acid | 0.08 | 0.0831 | 104 | 70-130 |
| 335-76-2 | Perfluorodecanoic acid | 0.08 | 0.0820 | 103 | 70-130 |
| 2058-94-8 | Perfluoroundecanoic acid | 0.08 | 0.0875 | 109 | 70-130 |
| 307-55-1 | Perfluorododecanoic acid | 0.08 | 0.0888 | 111 | 70-130 |
| 72629-94-8 | Perfluorotridecanoic acid | 0.08 | 0.0873 | 109 | 65-130 |
| 376-06-7 | Perfluorotetradecanoic acid | 0.08 | 0.0879 | 110 | 70-130 |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.08 | 0.0824 | 103 | 70-130 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.08 | 0.0859 | 107 | 70-130 |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.08 | 0.0849 | 106 | 70-130 |
| 375-92-8 | Perfluoroheptanesulfonic acid | 0.08 | 0.0875 | 109 | 70-130 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.08 | 0.0799 | 100 | 70-130 |
| 68259-12-1 | Perfluorononanesulfonic acid | 0.08 | 0.0852 | 107 | 65-130 |
| 335-77-3 | Perfluorodecanesulfonic acid | 0.08 | 0.0809 | 101 | 60-130 |
| 754-91-6 | PFOSA | 0.08 | 0.0828 | 104 | 70-130 |
| 2355-31-9 | MeFOSAA | 0.08 | 0.0801 | 100 | 70-130 |
| 2991-50-6 | EtFOSAA | 0.08 | 0.0771 | 96 | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate | 0.08 | 0.0842 | 105 | 70-130 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.08 | 0.0751 | 94 | 70-130 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | 0.08 | 0.0775 | 97 | 70-130 |

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---------|------------------------|-----|---------|
| | 13C4-PFBA | 81% | 35-135% |
| | 13C5-PFPeA | 82% | 50-150% |
| | 13C5-PFHxA | 84% | 50-150% |
| | 13C4-PFHpA | 83% | 50-150% |
| | 13C8-PFOA | 84% | 50-150% |
| | 13C9-PFNA | 85% | 50-150% |
| | 13C6-PFDA | 84% | 50-150% |
| | 13C7-PFUnDA | 79% | 40-140% |

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA80194
Account: SGS/SAKKA SGS North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| OP82752-BS | 4Q7512.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA80194-1, FA80194-2, FA80194-3, FA80194-4, FA80194-5, FA80194-6, FA80194-7, FA80194-8, FA80194-9

| CAS No. | ID Standard Recoveries | BSP | Limits |
|---------|------------------------|-----|---------|
| | 13C2-PFDoDA | 75% | 40-140% |
| | 13C2-PFTeDA | 75% | 30-130% |
| | 13C3-PFBS | 86% | 50-150% |
| | 13C3-PFHxS | 83% | 50-150% |
| | 13C8-PFOS | 82% | 50-150% |
| | 13C8-FOSA | 79% | 30-130% |
| | d3-MeFOSAA | 83% | 50-150% |
| | d5-EtFOSAA | 81% | 50-150% |
| | 13C2-4:2FTS | 83% | 50-150% |
| | 13C2-6:2FTS | 86% | 50-150% |
| | 13C2-8:2FTS | 86% | 50-150% |

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA80194
Account: SGS/SAK North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|-----|-----------|------------|------------------|
| OP82752-MS | 4Q7529.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |
| OP82752-MSD | 4Q7530.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |
| JD15288-2 | 4Q7528.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA80194-1, FA80194-2, FA80194-3, FA80194-4, FA80194-5, FA80194-6, FA80194-7, FA80194-8, FA80194-9

| CAS No. | Compound | JD15288-2 ug/l | Spike Q ug/l | MS ug/l | MS % | Spike ug/l | MSD ug/l | MSD % | RPD | Limits Rec/RPD |
|----------------|-------------------------------|-------------------|--------------------|------------|---------|---------------|-------------|----------|-----|-------------------|
| 375-22-4 | Perfluorobutanoic acid | 0.0429 | 0.08 | 0.139 | 120 | 0.087 | 0.142 | 114 | 2 | 70-130/30 |
| 2706-90-3 | Perfluoropentanoic acid | 0.0813 | 0.08 | 0.172 | 113 | 0.087 | 0.173 | 105 | 1 | 70-130/30 |
| 307-24-4 | Perfluorohexanoic acid | 0.0456 | 0.08 | 0.130 | 106 | 0.087 | 0.139 | 107 | 7 | 70-130/30 |
| 375-85-9 | Perfluoroheptanoic acid | 0.0257 | 0.08 | 0.118 | 115 | 0.087 | 0.120 | 108 | 2 | 70-130/30 |
| 335-67-1 | Perfluorooctanoic acid | 0.0660 | 0.08 | 0.162 | 120 | 0.087 | 0.164 | 113 | 1 | 70-130/30 |
| 375-95-1 | Perfluorononanoic acid | 0.0066 | 0.08 | 0.0965 | 112 | 0.087 | 0.0992 | 106 | 3 | 70-130/30 |
| 335-76-2 | Perfluorodecanoic acid | 0.0019 | J 0.08 | 0.0864 | 106 | 0.087 | 0.0890 | 100 | 3 | 70-130/30 |
| 2058-94-8 | Perfluoroundecanoic acid | ND | 0.08 | 0.0863 | 108 | 0.087 | 0.0939 | 108 | 8 | 70-130/30 |
| 307-55-1 | Perfluorododecanoic acid | ND | 0.08 | 0.0890 | 111 | 0.087 | 0.0926 | 106 | 4 | 70-130/30 |
| 72629-94-8 | Perfluorotridecanoic acid | ND | 0.08 | 0.102 | 128 | 0.087 | 0.0976 | 112 | 4 | 65-130/30 |
| 376-06-7 | Perfluorotetradecanoic acid | ND | 0.08 | 0.0872 | 109 | 0.087 | 0.0949 | 109 | 8 | 70-130/30 |
| 375-73-5 | Perfluorobutanesulfonic acid | 0.0052 | 0.08 | 0.0888 | 105 | 0.087 | 0.102 | 111 | 14 | 70-130/30 |
| 2706-91-4 | Perfluoropentanesulfonic acid | 0.0034 | 0.08 | 0.103 | 125 | 0.087 | 0.111 | 124 | 7 | 70-130/30 |
| 355-46-4 | Perfluorohexanesulfonic acid | 0.0125 | 0.08 | 0.109 | 121 | 0.087 | 0.106 | 108 | 3 | 70-130/30 |
| 375-92-8 | Perfluoroheptanesulfonic acid | ND | 0.08 | 0.0980 | 123 | 0.087 | 0.0936 | 108 | 5 | 70-130/30 |
| 1763-23-1 | Perfluorooctanesulfonic acid | 0.0339 | 0.08 | 0.113 | 99 | 0.087 | 0.121 | 100 | 7 | 70-130/30 |
| 68259-12-1 | Perfluorononanesulfonic acid | ND | 0.08 | 0.0862 | 108 | 0.087 | 0.0827 | 95 | 4 | 65-130/30 |
| 335-77-3 | Perfluorodecanesulfonic acid | ND | 0.08 | 0.0770 | 96 | 0.087 | 0.0793 | 91 | 3 | 60-130/30 |
| 754-91-6 | PFOSA | ND | 0.08 | 0.0941 | 118 | 0.087 | 0.0994 | 114 | 5 | 70-130/30 |
| 2355-31-9 | MeFOSAA | ND | 0.08 | 0.0841 | 105 | 0.087 | 0.0959 | 110 | 13 | 70-130/30 |
| 2991-50-6 | EtFOSAA | ND | 0.08 | 0.0837 | 105 | 0.087 | 0.0878 | 101 | 5 | 70-130/30 |
| 757124-72-44:2 | Fluorotelomer sulfonate | ND | 0.08 | 0.0838 | 105 | 0.087 | 0.0884 | 102 | 5 | 70-130/30 |
| 27619-97-2 | 6:2 Fluorotelomer sulfonate | 0.0062 | J 0.08 | 0.0844 | 98 | 0.087 | 0.0914 | 98 | 8 | 70-130/30 |
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND | 0.08 | 0.0839 | 105 | 0.087 | 0.0898 | 103 | 7 | 70-130/30 |

| CAS No. | ID Standard Recoveries | MS | MSD | JD15288-2 | Limits |
|-------------|------------------------|-----|-----|-----------|---------|
| 13C4-PFBA | | 70% | 66% | 75% | 35-135% |
| 13C5-PFPeA | | 80% | 75% | 87% | 50-150% |
| 13C5-PFHxA | | 81% | 75% | 85% | 50-150% |
| 13C4-PFHpA | | 83% | 76% | 90% | 50-150% |
| 13C8-PFOA | | 89% | 81% | 98% | 50-150% |
| 13C9-PFNA | | 89% | 82% | 95% | 50-150% |
| 13C6-PFDA | | 93% | 80% | 98% | 50-150% |
| 13C7-PFUnDA | | 92% | 74% | 100% | 40-140% |

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA80194
Account: SGS/KA SGS North America, Inc
Project: 1205868

| Sample | File ID | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|-----|-----------|------------|------------------|
| OP82752-MS | 4Q7529.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |
| OP82752-MSD | 4Q7530.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |
| JD15288-2 | 4Q7528.D | 1 | 11/01/20 | NAF | 10/30/20 | OP82752 | S4Q104 |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA80194-1, FA80194-2, FA80194-3, FA80194-4, FA80194-5, FA80194-6, FA80194-7, FA80194-8, FA80194-9

| CAS No. | ID Standard Recoveries | MS | MSD | JD15288-2 | Limits |
|---------|------------------------|------|-----|-----------|---------|
| | 13C2-PFDoDA | 85% | 70% | 94% | 40-140% |
| | 13C2-PFTeDA | 68% | 64% | 88% | 30-130% |
| | 13C3-PFBS | 76% | 67% | 79% | 50-150% |
| | 13C3-PFHxS | 81% | 75% | 85% | 50-150% |
| | 13C8-PFOS | 90% | 77% | 91% | 50-150% |
| | 13C8-FOSA | 57% | 49% | 63% | 30-130% |
| | d3-MeFOSAA | 117% | 89% | 126% | 50-150% |
| | d5-EtFOSAA | 116% | 93% | 128% | 50-150% |
| | 13C2-4:2FTS | 83% | 80% | 87% | 50-150% |
| | 13C2-6:2FTS | 97% | 88% | 96% | 50-150% |
| | 13C2-8:2FTS | 104% | 88% | 103% | 50-150% |

* = Outside of Control Limits.

LABORATORY DATA REVIEW CHECKLIST

Completed by: Alec Rizzo

Title: Environmental Staff

Date: November 16, 2020

CS Report Name: 2020 Groundwater and Drinking Water Monitoring, UAA KPC MAPTS, Mile 3.2 Kalifornsky Beach Road, Soldotna, Alaska

Laboratory Report Date: November 11, 2020

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America Inc.

Laboratory Report Number: 1205868

ADEC File Number: 2333.38.034

ADEC Hazard ID Number: 454

(NOTE: NA = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes** / No / NA (please explain)

Comments:

- 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 / NA (please explain)

Comments: *Analyses were performed by SGS of Orlando, Florida.*

2. Chain of Custody (COC)

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

Yes / No / NA (please explain)

Comments:

- b. Correct analyses requested? **Yes** / No / NA (please explain)

Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($0^{\circ} \pm 6^{\circ} \text{C}$)? **Yes** / No / NA (please explain)
Comments: *The cooler temperature was 2.7°C upon receipt at SGS in Anchorage, Alaska and 4.2°C at SGS in Orlando, Florida.*
- b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)? **Yes** / No / NA (please explain)
Comments:
- c. Sample condition documented - broken, leaking (Methanol), zero headspace (VOC vials)? **Yes** / No / NA (please explain)
Comments:
- d. If there were any discrepancies, were they documented? – For example, incorrect sample containers/preservation, sample temperature outside acceptance range, insufficient or missing samples, etc.? **Yes** / No / **NA** (please explain)
Comments: *No discrepancies noted.*
- e. Data quality or usability affected? Please explain.
Comments: *Data quality/usability are considered unaffected; see above.*

4. Case Narrative

- a. Present and understandable? **Yes** / No / NA (please explain)
Comments:
- b. Discrepancies, errors, or QC failures identified by the lab? **Yes** / **No** / NA (please explain)
Comments: *No discrepancies, errors, or QC failures were noted.*
- c. Were corrective actions documented? **Yes** / No / **NA** (please explain)
Comments:
- d. What is the effect on data quality/usability, according to the case narrative?
Comments: *The case narrative does not discuss data quality/usability.*

5. Sample Results

- a. Correct analyses performed/reported as requested on COC? **Yes** / No / NA (please explain)
Comments:
- b. All applicable holding times met? **Yes** / No / NA (please explain)
Comments:

c. All soils reported on a dry weight basis? **Yes / No / NA** (please explain)
Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes / No / NA** (please explain)
Comments:

e. Data quality or usability affected? Please explain. **NA**
Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (please explain)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA** (please explain)
Comments: Although, the method blank contained an estimated concentration of 6:2 fluorotelomer sulfonate (3.6 J ng/L) less than the reporting limit.

iii. If above LOQ or project specified objectives, what samples are affected?
Comments: *All samples.*

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes / No / NA (please explain)
Comments: The concentrations detected in B4MW, B5MW, and B14MW are greater than 10 times the blank concentration, therefore are reported at the laboratory detected concentration. 6:2 fluorotelomer sulfonate was not detected in the remaining samples therefore flagging is not required

v. Data quality or usability affected? Please explain. **NA**
Comments: *No, 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 / NA**
(please explain)
Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA** (please explain)
Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes** / No / NA (please explain)

Comments:

iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes** / No / NA (please explain)

Comments:

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

Comments:

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined? **Yes** / No / **NA** (please explain)

Comments: *See above.*

vii. Data quality or usability affected? Please explain. **NA**

Comments: *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 / NA

Comments:

ii. Metals/Inorganics - One MS and one MSD reported per matrix, analysis and 20 samples? **Yes** / No / **NA**

Comments: *Only organic analyses were 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: AK 101 60%-120%, AK 102 75%-125%, AK 103 60%-120%; all other analyses see the laboratory QC pages) **Yes** / No / NA

Comments:

iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits and project specified objectives, if applicable. RPD reported from MS/MSD, and/or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes** / No / NA

Comments:

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

Comments:

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

Yes / No / **NA**

Comments:

- vii. Data quality or usability affected?

Comments: *See above.*

d. Surrogates - Organics Only

- i. Are surrogate recoveries reported for organic analyses, field, QC, and laboratory samples? **Yes** / No / NA (please explain)

Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes** / No / NA (please explain)

Comments:

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined? Yes / No / **NA** (please explain)

Comments:

- iv. Data quality or usability affected? Please explain. **NA**

Comments:

e. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.)

- i. One trip blank reported per matrix, analysis and cooler? (If not, enter explanation below.) Yes / No / **NA** (please explain)

Comments: *Volatile analyses were not requested with this work order.*

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment stating why must be entered below.) Yes / No / **NA** (please explain)

Comments:

- iii. All results less than LOQ? Yes / No / **NA** (please explain)

Comments:

- iv. If above LOQ, what samples are affected? **NA**

Comments:

- v. Data quality or usability affected? Please explain. **NA**
Comments:

f. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
Yes / No / NA (please explain)
Comments: *Groundwater Sample B14MW is the field duplicate of Sample B4MW. Drinking water Sample CAMP2 is the field duplicate of Sample CAMP.*
- ii. Submitted blind to the lab? **Yes** / No / NA (please explain)
Comments:
- iii. Precision – All relative percent differences (RPDs) less than specified DQOs? (Recommended: 30% for water, 50% for soil) **Yes** / No / NA (please explain)
Comments: *The RPDs were within the specified DQOs.*
- iv. Data quality or usability affected? Please explain. **NA**
Comments: *See above.*

g. Decontamination or Equipment Blank

- Yes** / No / **NA** (please explain)
Comments: *No decontamination or equipment blank submitted as per our work plan. All results less than LOQ? Yes / No / **NA** (please explain)*
Comments:
- i. If above LOQ, what samples are affected? **NA**
Comments:

- ii. Data quality or usability affected? Please explain. **NA**

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

- a. Defined and appropriate? **Yes** / No / NA (please explain)
Comments: *A key is provided on page 6 and on the bottom of pages 14-31 and 42-45.*

APPENDIX C
IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL/ENVIRONMENTAL REPORT



Date: December 2020
To: University of Alaska Anchorage
Facilities Planning & Construction

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

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

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

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

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