# NAPA AUTO PARTS 2018/2019 ON-SITE GROUNDWATER MONITORING REPORT

# 1937 VAN HORN ROAD FAIRBANKS, ALASKA

MAY 15, 2019



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#### ACRONYMS AND ABBREVIATIONS

AFFF	Aqueous Film Forming Foam
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
Alyeska	Alyeska Pipeline Service Company
AMSL	Above Mean Sea Level
Bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, xylenes
COCs	Contaminants of concern
CSM	Conceptual Site Model
су	Cubic yards
12DBE	1,2-Dibromoethane
DL	Detection Limit
DO	Dissolved Oxygen
DPT	Direct Push Technology
DQOs	Data quality objectives
DRO	Diesel Range Organics
EPA	Environmental Protection Agency
FIAPFD	Fairbanks International Airport Police and Fire Department
FFD	Fairbanks Fire Department
FWFD	Fort Wainwright Fire Department
FNSB	Fairbanks North Star Borough
FSG	2017 ADEC Field Sampling Guidance
GPC	Genuine Parts Company
GRO	Gasoline Range Organics
GVEA	Golden Valley Electric Association
IDW	Investigation-Derived Waste
LCS/LCSD	Laboratory Control Sample/Duplicate
LDRC	Laboratory Data Review Checklist
LHA	Lifetime Health Advisory
LOQ	Limit of Quantitation
mg/kg	Milligrams per kilogram
mg/L	Milligrams per Liter
mv	Millivolts
MS/MSD	Matrix Spike Sample/Duplicate
MW	Monitoring well
NPFD	North Pole Fire Department
OD	Outer Diameter
OII	Organic Incineration Technology, Inc.
ORP	Oxidation/reduction potential
%	Percent
PAHs	Polynuclear Aromatic Hydrocarbons
PCE	l etrachloroethylene
PFAS	Per- and Polyfluoroalkyl Substances
PEBS	Pertiuorobutane Sultonate
PFOA	Pertluorooctanoic Acid
PFOS	Pertiuorooctanesultonic Acid
PID	Photoionization Detector



#### **ACRONYMS AND ABBREVIATIONS (Continued)**

+/-	Plus/Minus
ppm	parts per million
PVC	Polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percent Difference
SA	Site assessment
SGS	SGS North America Inc.
SAVFD	Steese Area Volunteer Fire Department
ТВМ	Temporary bench mark
123TCP	1,2,3-Trichloropropane
TOC	Top of Casing
TSP	Temporary sampling point
µg/L	Micrograms per Liter
UFD	University Fire Department
VOCs	Volatile Organic Compounds
WP	Work Plan



#### 1.0 EXECUTIVE SUMMARY

This report describes the October 2018 and February 2019 per- and polyfluoroalkyl substances (PFAS) groundwater sampling at the NAPA Van Horn Facility (the Site). This Report also describes the October 2018 annual groundwater sampling of non-PFAS compounds. **NORTECH** performed the field activities in accordance with the NAPA 2018 Long Term Groundwater Monitoring Plan Revision 2 (WP) (August 6, 2018 WP) and January 14, 2019 Scope of Work (SOW) for PFAS sampling.

The August 2018 WP was written to address comments by the Alaska Department of Environmental Conservation (ADEC) in a letter dated May 21, 2018. ADEC approved the August 2018 WP in a letter dated August 31, 2018. The January 2019 SOW was written after results of the October 2018 groundwater sampling was submitted to ADEC on January 6, 2019. The PFAS results of the offsite well sampled as part of the October 2018 sampling event has been submitted in a separate report as are the results of the Spring 2019 PFAS offsite sampling completed from neighborhood water wells.

As approved by ADEC, the October 2018 field work included sampling for volatile organic compounds (VOCs) in monitoring wells (MW) MW1R and MW2, and diesel range organics (DRO) and VOCs in MW3 and MW4. All four wells were also tested for PFAS compounds. DRO was not detected in monitoring wells MW3 and MW4. VOCs, including 1,2-dibromoethane (12DBE) and 1,2,3-trichloropropane (123TCP) were not detected in any of the four monitoring wells.

In October 2018, the sum of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) concentrations were reported above the ADEC Action Level of 0.070 microgram per Liter ( $\mu$ g/L) in all four monitoring wells. Concentrations were as much as 370 times the ADEC Action Level. PFOS had the highest concentrations in each monitoring well. Concentrations were highest in monitoring well MW2 located at the northwest corner of the NAPA building. MW1R had the next highest concentrations. The sum of the two PFAS compounds were significantly lower in MW3 and MW4, but still exceeded the ADEC Action Level.

In February 2019, the ADEC Action Level was exceeded in the four on-Site monitoring wells, confirming the October 2018 results. Concentrations were again highest in MW1R and MW2, up to 614 times the LHA. The results of the groundwater monitoring confirm PFAS compounds were the fire-fighting foam used to suppress the 2011 facility fire. The level of PFOS/PFOA at the Site is greater than two orders of magnitude above the LHA in MW2.

**NORTECH** recommends submitting this report to ADEC as documentation of completing onsite groundwater monitoring in accordance with the August 2018 ADEC letter and January 2019 SOW. Based on the laboratory results, it is requested ADEC consider No Further Action required for additional petroleum and VOC groundwater monitoring in the four monitoring wells.

The PFAS laboratory results of the on-Site monitoring wells confirms the presence of PFAS at the western perimeter of the property boundary. Additional site characterization and testing is recommended to determine the level and extent of PFOS/PFOA contamination in the soil, and shallow and deep groundwater tables at the Site perimeter and immediately downgradient to the north and west. It is anticipated a PFAS Work Plan will be required to detail the proposed method and procedures of installing soil borings, temporary sampling points (TSPs), and permanent groundwater MWs needed to complete the site characterization.



#### 2.0 BACKGROUND AND FIRE-FIGHTING EFFORT RESEARCH

This report describes the October 2018 and February 2019 groundwater sampling conducted at the NAPA facility at 1937 Van Horn Road in Fairbanks, Alaska (the Site). Figures 1, 2, and 3 in Appendix 1 show the location, vicinity, and Site map of the monitoring wells. Genuine Parts Company (GPC) owns the building and leases the Site. On May 26, 2011, a fire consumed the NAPA Auto Parts store and warehouse, located at 1937 Van Horn Road in Fairbanks. Water and aqueous film forming foam (AFFF) product sprayed on the building during firefighting efforts acted as a transport mechanism to carry hazardous materials across the paved parking lot to adjacent properties. Hazardous materials included oil, grease, lubricants, glycols, solvents, paint, and batteries.

The NAPA store on Van Horn Road is in the University Fire Department (UFD) district. UFD made the initial response to the fire and was assisted by four other departments: Fairbanks Fire Department (FFD), Fort Wainwright Fire Department (FWFD), Steese Area Volunteer Fire Department (SAVFD), and North Pole Fire Department (NPFD). Following the initial firefighting response, UFD personnel used absorbent pads to mop up observed run-off contamination from onsite materials. The initial environmental response included the removal of standing water, sheen and floating product from around the NAPA building using a vacuum truck, absorbent pads, and booms. The top foot of soil was removed during June 2011 excavation prior to an environmental site characterization performed by **NORTECH** in the fall of 2011.

In July 2015, ADEC had contacted **NORTECH** to clarify the use and volume of AFFF used to combat the NAPA fire in 2011. **NORTECH** contacted UFD Fire Chief Doug Schrage to determine if and how much AFFF were used during fire suppression efforts. Chief Schrage said a single apparatus was requested from Fairbanks International Airport Police and Fire Department (FIAPFD). Then-Deputy Fire Chief Dan Grimes stated that the Airport trucks have a 400-gallon capacity for AFFF and approximately 100 gallons may have been used on the NAPA fire. At the time of this fire in 2011, FIAPFD used an AFFF product manufactured by Ansul called Ansulite 3% Freeze Protected AFFF (Ansulite 3%).

**NORTECH** requested information from Ansul on December 19, 2017 to confirm specifications for Ansulite 3%. The product is a proprietary blend of PFCs and the formulation contains average concentrations of PFOA/PFOS compounds estimated to be 1 part per million (ppm). The primary PFCs found in this product are known to biodegrade to PFOA under the right conditions in the presence of oxygen.

#### 2.1 Previous Investigations

ADEC has multiple reports on file documenting investigations at this Site due to a release of petroleum and other products during a fire and associated firefighting activities on May 26, 2011. The most comprehensive is the January 22, 2013 *Site Characterization and Corrective Action Report* (2013 Report) containing background information regarding past and present conditions at the Site, as well as methodology for completed work.

Results from the 2011 site characterization indicated diesel range organics (DRO) and tetrachloroethene (PCE) contamination remained in place in soil beneath the southern portion of the building, with the highest concentrations at the original building corners. An addition was added to the south side of the building in the summer 2013.



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From April 2013 through October 2014, additional groundwater monitoring was completed as described in the *2013 & 2014 Groundwater Monitoring Report* dated May 1, 2015 (2015 Groundwater Report). The 2013/2014 monitoring was also summarized in the June 5, 2017 WP. The results of the 2013/2014 groundwater monitoring showed an overall decreasing trend in shallow groundwater contamination from 2011 through 2014.

Concentrations of DRO, glycols, benzene, and other volatile organic compounds (VOCs) detected in 2011 in MW1 and MW2 had significantly decreased in these wells, meeting the cleanup levels for the contaminants of concern (COCs). The 2014 water table elevation measurements indicated the hydraulic gradient is generally to the northwest, consistent with the documented regional hydraulic gradient. In October 2014, MW1 was decommissioned and replaced.

The results of the two-year onsite and laboratory geochemical testing indicated anaerobic biological degradation of contamination was occurring. Iron reduction and methanogenesis appeared to be the primary biological degradation pathways. The geochemical data demonstrated the potential for biological degradation and reduction of contaminant mass in the groundwater over time. Additional geochemical testing was not considered necessary unless PCE concentrations rise in MW4 or PCE appears to be migrating to other wells.

ADEC issued a determination on July 15, 2015 stating contaminants had been satisfactorily removed from affected soils which may have been impacted due to the 2011 fire at the NAPA store. Long term groundwater monitoring was to be continued. In the fall 2017 groundwater monitoring and well survey was conducted at the NAPA facility, as documented in the *Long-Term Groundwater Monitoring 2017 Interim Report* (2017 Report), dated May 1, 2018.

The 2017 groundwater elevation survey by Design Alaska, Inc. of Fairbanks confirmed groundwater flow is generally northwest. This was consistent with documented regional flow and the 2014 elevation survey gradient. The 2017 report noted PCE has never been detected in MW1 and in MW2, PCE has not been detected since 2011. DRO, glycols, benzene, and other VOCs detected previously have significantly decreased and/or become undetectable. *NORTECH* recommended no additional sampling of MW1R [Replacement] and MW2 for DRO and the full list of VOCs, since the two wells meet the trend analysis requirements for the two parameters using the Mann-Kendall Test.

The 2017 Report also noted PCE has never been detected in MW3 and in MW4, the 2017 PCE concentration was the lowest detected concentration since monitoring began. Only one other VOC has ever been detected in either well (MW3) and was detected below the limit of quantitation (LOQ) and well below the cleanup level. The 2017 Report added the three sampling events over the four-year period demonstrate contamination has not migrated from beneath the building foundation to shallow groundwater and PCE does not appear to be migrating from MW4 to other wells. *NORTECH* recommended the second-round groundwater monitoring scheduled for the fall 2018 be limited to sampling monitoring wells MW3 and MW4 only.

The May 2018 ADEC letter was in response to 2017 Report. ADEC noted the consideration of no further sampling of MW1R and MW2 would depend on the results of the 2018 groundwater sampling tests, and additional VOC testing using a method with lower detection limits to confirm the absence of 12DBE and 123TCP. The 2017 sample results for 12DBE and 123TCP were non-detect under the Environmental Protection Agency (EPA) Method SW8260C. The lab LOQ of 12DBE was equal to and the detection limit (DL) was less than ADEC groundwater cleanup



level. This confirmed the analyte was not present above groundwater cleanup level in the 2017 samples. The LOQ and DL of 123TCP in samples were greater than ADEC groundwater cleanup level and could not be eliminated as a contaminant of concern. *NORTECH* reviewed soil and groundwater test data from the previous Site investigations and could not confirm the two analytes were not present in soil and groundwater below ADEC cleanup levels.

#### 2.2 Planning and ADEC Coordination

The 2018 Groundwater WP was completed and revised to address comments in the May 21, 2018 ADEC letter requesting sampling for 123TCP and 12DBE, and PFAS compounds found in fire-fighting foam. ADEC approved the WP in their August 31, 2018 letter. *NORTECH* sampled the on-Site monitoring wells for DRO, VOCs, and PFAS on October 9, 2018. On January 6, 2019, the laboratory analytical results were forwarded to ADEC. In a January 8, 2019 email to GPC and *NORTECH*, ADEC indicated an immediate response would be required to address potential off-Site migration of PFAS. This was followed by a conference call between GPC, *NORTECH*, and ADEC on January 10, 2019.

The on-Site PFAS sampling SOW described below is the result of the conference call. The Winter/Spring 2019 off-Site private water well search and sampling investigation around NAPA is being documented in the NAPA Auto Parts Off-Site Private Water Well Search & Sampling Report submitted separately.

#### 3.0 SCOPE OF WORK AND METHODOLOGY

#### 3.1 Approved Onsite Scope of Work

The SOW for onsite groundwater monitoring was described the August 2018 WP, ADEC's August 2018 approval letter, and January 10, 2019 Conference Call Summary electronic mail. ADEC specified the on-Site monitoring wells be tested for PFAS by EPA 537 and 12DBE and 123TCP by EPA Method 8011 or similar. MW3 and MW4 was also to be tested for DRO by AK 102 and VOCs by EPA Method 8260. The on-Site portion of the January 14, 2019 SOW specified the four monitoring wells be resampled for PFAS using the same protocol as in October 2018 to confirm the October PFAS results.

#### 3.2 Methodology

The October 2018 monitoring well sampling was performed in accordance with the August 2018 WP. The February 2019 monitoring well sampling was performed in accordance with the January 14, 2019 emailed SOW and WP attachments with standard operating procedures. The October 2018 and February 2019 monitoring well sampling was completed by qualified environmental professionals as defined by 18 Alaska Administrative Code (AAC) 75, 18 AAC 78, and the ADEC August 2017 Field Sampling Guidance (2017 FSG). Sampling methods were in general accordance with the 2017 FSG, and as further defined in the August 2018 WP. This included sampling location, quantity and methods, field duplicate, and other quality assurance/quality control (QA/QC) samples.

#### 3.2.1 Groundwater Monitoring

**NORTECH**'s standard methodology section Laboratory Sampling Plan provided in Attachment 3 of the 2018 WP detailed sampling methodologies for the fieldwork. Depth to groundwater and total depth of the four wells (MW1R, MW2, MW3, and MW4) were measured using an electronic oil/water interface level indicator probe. All water quality parameters except turbidity were



obtained using a YSI meter within a flow-through cell. Water clarity was evaluated by visual observation before the water entered the flow-through cell and was recorded as clear or turbid. Field parameters measured during purging were obtained using a calibrated YSI™ ProDSS water quality meter. Water quality parameters were recorded in a field notebook.

Water quality parameters were considered stable when three successive readings, taken 3 to 5 minutes apart, were within:

- $\pm$  3% for temperature (maximum of  $\pm$  0.2 °C)
- ± 0.1 for pH
- ± 3% for conductivity
- ± 10 millivolts (mv) for oxidation/reduction potential (ORP)
- ± 10% for dissolved oxygen (DO)

The five parameters above and visual clarity were monitored and recorded as presented in the field notes in Appendix 3. The four wells were purged and sampled using the Proactive<sup>™</sup> Supernova 70 Engineered Plastic Pump with Low Flow Sampling Controller, decontaminated between wells to avoid cross-contamination. To prevent potential VOC loss, a submersible pump was utilized to ensure air bubbles were not entrained with the water during purging and sampling efforts.

After purging, water samples were collected directly from the pump discharge tubing into laboratory-supplied sample bottles as outlined in Appendix E of the 2017 FSG. New disposable gloves were worn to collect samples. Gloves were changed between samples. Sample containers were filled quickly, and immediately preserved as necessary. For semi-volatile samples, headspace in the sample container was minimized by filling the container until a positive meniscus was present. Teflon-lined screw caps provided by the laboratory were used to seal the containers.

#### 3.2.2 PFAS Sampling

In addition to sampling for DRO and VOCs in the monitoring wells, each of the on-Site monitoring wells was sampled for PFAS using **NORTECH**'s July 2018 PFCs Groundwater Sampling Plan as submitted as an attachment in the 2019 WP and 2019 SOW. Equipment and field blanks were collected using PFAS-free water provided by SGS North America (SGS) an ADEC-approved laboratory in Anchorage, Alaska laboratory contracted for analysis. Samples were submitted to the Fairbanks sample-receiving office of SGS; the PFAS samples were transferred to their Anchorage laboratory, then to their laboratory in Florida which performs the PFAS analysis.

#### 3.2.3 Quality Assurance/Quality Control

QA/QC objectives were as described in the 2017 FSG. Field QA/QC procedures included adherence to the WP, handling samples under chain-of-custody procedures, submitting samples within specified holding times, and collecting field duplicate samples. Equipment blank samples were collected and submitted for analysis with each of the monitoring well sampling events, as a non-dedicated submersible pump was used for sampling the monitoring wells.

PFAS field blank samples were collected and submitted with each of the monitoring well PFAS sampling events. Laboratory QA/QC procedures include analysis of method blanks; laboratory



control samples (LCS) and LCS duplicates (LCSD); and matrix spike samples (MS) and MS duplicates (MSD).

#### 3.3 EPA Lifetime Health Advisory & Deviations from Work Plans

In 2016, the EPA established a lifetime health advisory (LHA) of 0.070  $\mu$ g/L for the combined concentrations PFOS and PFOA in drinking water to assist state and local officials and drinking water system operators in evaluating risks from these contaminants. These LHAs were created so appropriate action can be taken to protect residents.

On August 20, 2018, ADEC issued a Technical Memorandum titled "Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water." establishing PFAS Action Levels for groundwater and surface water used as drinking water. A 0.07  $\mu$ g/L Action Level was set for the sum of five PFAS chemicals with a second action level of 2.0  $\mu$ g/L for perfluorobutane sulfonate (PFBS).

The ADEC August 31, 2018 WP approval letter further specified a minimum of six PFAS compounds should be tested for, reported, and compared to the action levels described in the memo. The testing and reporting for the six compounds were also stated in the January 2019 SOW. *NORTECH* completed the October 2018 and February 2019 groundwater sampling in accordance with the August 2018 ADEC letter (and January 2019 SOW), testing for the six PFAS compounds.

In February 2019, the EPA published a PFAS Action Plan with a national drinking water regulatory determination for PFOA and PFOS only. On April 9, 2019, ADEC issued a Technical Memorandum stating ADEC will use the EPA LHA for PFOS plus PFOA above 0.07  $\mu$ g/L as the Action Level. Any new testing for PFAS will be for PFOS and PFOA only.

**NORTECH** contacted ADEC in April 2019 following the release of the 2019 Technical Memorandum requesting additional time to revise the report to reflect the updated PFAS reporting levels to reporting on the concentrations of PFOS and PFOA only. ADEC responded with no objection.

A second deviation from the WP was the use in a decontaminated steel tape measure instead of a product-detection probe in February 2019 to measure the depth to groundwater. The result is the groundwater gradient was not calculated due to the potential for an imprecise water level measurement.



#### 4.0 FIELD ACTIVITIES AND OBSERVATIONS

**NORTECH** conducted groundwater monitoring at the NAPA facility on October 9, 2018 and again on February 13, 2019 for PFAS. Groundwater monitoring consisted of purging and sampling monitoring wells MW1R, MW2, MW3, and MW4. Field notes are presented in Appendix 3 and photo pages are presented in Appendix 4.

#### 4.1 October 9, 2018 Monitoring Well Sampling

The two stickup wells, MW1R and MW2, and the two flush-mounted wells, MW3 and MW4, were inspected to confirm they were not damaged and were not frost-jacked. There is no outer steel protective casing around MW2, but the polyvinyl chloride (PVC) soil riser was in good condition and the threaded cap was present. There is no lid attached to the outer steel casing of MW1R. Flush mount wells MW3 and MW4 were not frost-jacked. Excess hydrated bentonite was removed from around the interior monument of MW4.

Free product was not detected in any of the four monitoring wells using a product-detection probe. Between 25 and 40 gallons of water were purged from the wells for a total of 155 gallons of purge water, disposed at NRC, Alaska. No odors and/or sheen on the water were exhibited in any of the wells. Field duplicate sample MW-44 was collected from MW4. Equipment blank sample EB-Napa VH was collected in the field following sampling of MW3. A field blank was prepared in the parking lot of the Site.

The off-Site private well at 2081 Van Horn Road, at the business to the west of NAPA (Alaska Dreams, Inc.), was also sampled (HR-1) on October 9, 2018. Methodology, observations, and results are presented in the *Off-Site Private Well Search and Sampling Report* to be submitted separately.

#### 4.2 February 2019 Monitoring Well Resampling

The four monitoring wells were inspected and found to be in good condition. Free product was not detected in any well. The depth to groundwater was measured using a decontaminated steel tape measure instead of a product-detection probe or a water-level meter to minimize PFAS cross contamination. Groundwater gradient was not calculated due to the potential for an imprecise water level measurement.

Between seven and 13 gallons of water were purged from each well for a total of 40 gallons of purge water, containerized on Site. No odors and/or sheen on the water were exhibited in any of the wells. Field duplicate sample MW-33 was collected from MW3. Equipment blank sample EB-1 was collected after sampling MW3. Field blank sample Field Blank-1 was prepared in the parking lot of the Site.

#### 4.3 Investigation-Derived Waste (IDW) Management

Approximately 155 gallons of groundwater generated during well purging and equipment decontamination water were containerized and temporarily stored on Site. The containerized water was transported to NRC for disposal on October 16, 2018. Purge water from the February 2019 sampling event was drummed and stored on Site and is pending disposal. Used disposable sampling supplies from the 2018 sampling event were double bagged and disposed with other non-hazardous waste in a trash receptacle.



#### 5.0 ANALYTICAL RESULTS AND QUALITY CONTROL

#### 5.1 October 2018 Monitoring Well Sampling

The tables in Appendix 2 summarize the October 2018 and February 2019 PFAS concentrations for the four monitoring wells on Site. The laboratory report and Laboratory Data Review Checklist (LDRC) are presented in Appendix 5.

Table 1, Appendix 2 presents the monitoring wells results for petroleum analyses. VOCs including 12DBE and 123TCP were not detected in any of the four monitoring wells. DRO was not detected in MW3 and MW4.

Both regulated PFAS compounds PFOS and PFOA were detected in all four monitoring wells (Table 2). The highest concentrations of the sum of PFOS and PFOA were reported in MW2 and MW1R at 25.9  $\mu$ g/L and 24.3  $\mu$ g/L, respectively. The sum of PFOS/PFOA reported in MW3 was 0.42  $\mu$ g/L, and 0.91  $\mu$ g/L in MW4. The sum of the PFOS/PFOA in all four wells were greater than the ADEC Action Level/LHA of 0.07  $\mu$ g/L.

#### 5.2 February 2019 Monitoring Well Resampling

February 2019 PFAS concentrations in the monitoring wells are summarized in Table 2. Both regulated PFAS were detected above the ADEC Action level/LHA in three of four monitoring wells. MW3 PFOS and PFOA individual concentrations were below the LHA but the sum of both was greater than the LHA. The highest PFOS concentrations were reported in MW2 and MW1R at 42.2  $\mu$ g/L and 16.9  $\mu$ g/L, respectively. The highest concentration of PFOA was reported in MW2 at 0.0853  $\mu$ g/L.

#### 5.3 Quality Assurance/Quality Control

Part of the data quality objectives (DQOs) for this project were to produce data of adequate quality as outlined in the 2017 FSG for comparison to the 18 AAC 75.345 groundwater cleanup levels. The primary tool used to assess data quality was the ADEC LDRC. LDRCs were completed for the laboratory work orders and are included in Appendix 5 with the laboratory reports. The SGS laboratory report case narrative was reviewed against the ADEC LDRC for potential laboratory QC issues.

Field duplicate pairs serve as a QC check on the repeatability of field sampling techniques and of laboratory error. Precision, expressed as the relative percent difference (RPD) between field duplicate sample results, is an indication of consistency in sampling, sample handling, preservation, and laboratory analysis. The RPD was calculated according to ADEC's FSG (the difference between the field duplicate results expressed as a percentage of the average of those results).

October 2018 RPDs for the field duplicate pair collected from MW4 did not have petroleum hydrocarbons or VOC results above the laboratory LOQ or detection limit (DL) for any analyte, so RPDs were not calculated. October 2018 RPDs for PFAS compounds collected from the field duplicate pair MW4 had five exceed the RPD of plus or minus (+/-) 30%; RPDs were as high as 61%. February 2019 RPDs from MW3 met the DQO.

The DQO exceedances for the October 2018 PFAS results are not significant because results for both samples either exceeded the ADEC Action Level/LHA or did not exceed the Action Level/LHA. RPD calculated results for PFAS compounds are presented in Table 2.



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Another QC check was to compare the LOQs and DLs with ADEC cleanup levels for non-PFAS compounds and the ADEC Action Level/ EPA LHA for PFOS and PFOA. The laboratory LOQ for 123TCP was greater than the ADEC cleanup level but less than the DL, confirming 123TCP was not present in the samples. For the PFAS analysis, as noted in the LDRCs, laboratory DLs did not exceed the EPA LHA.

VOCs, including 12DBE and 123TCP, were not detected above their LOQs in the trip blank sample. VOCs were not detected in the equipment blank sample, with the following exception. Toluene was reported in the equipment blank sample at  $3.02 \ \mu g/L$ . Toluene has not been detected in MW1 or MW2 recently, so its presence in the equipment blank suggests incomplete decontamination of the sample pump. PFAS were not detected in the equipment blank or field blank samples.

The data quality review for these sampling events indicate there were no significant data quality issues associated with the laboratory results. The data quality is adequate, and results can be used to characterize contaminant concentrations, including PFAS of groundwater at the Site. The data quality issues associated with this report and the issues discussed above are also reviewed in the ADEC LDRCs.



#### 6.0 ANALYSIS AND DISCUSSION

**NORTECH** completed the October 2018 and February 2019 groundwater monitoring at the NAPA facility, 1937 Van Horn Road in Fairbanks, Alaska. Groundwater sampling including testing the four on-Site shallow monitoring wells for VOCs and PFAS compounds. Two of the four wells were also tested for DRO.

#### 6.1 Non-PFAS Groundwater Monitoring

During the October 2018 monitoring event, DRO and VOCs were not detected in the two monitoring wells MW3 and MW4. VOCs were not detected above LOQs in the four monitoring wells, including 12DBE. 123TCP was not detected in any of the four wells above the detection. The non-detect results for 12DBE and 123TCP in the four monitoring wells confirm those contaminants have not impacted the shallow groundwater table and they should be eliminated as contaminants of concern.

Table 3 in Appendix 2 presents the Historical Groundwater Results Summary for the four monitoring wells. The table shows a progressive downward trend in petroleum hydrocarbon and VOC concentrations resulting in no detected levels at this time. Based on the historical trend and current non-detect results, it is recommended ADEC consider a No Further Action required for additional petroleum fractions and VOC groundwater monitoring in the four monitoring wells.

#### 6.2 On-Site Monitoring Wells

In October 2018, the sum of PFOS and PFOA concentrations were reported above the ADEC Action Level/EPA LHA of 0.070 µg/L in all four monitoring wells. Concentrations were as much as 370 times the LHA. PFOS had the highest concentrations in each monitoring well. Concentrations were highest in monitoring well MW2 located at the northwest corner of the NAPA building. MW1R had the next highest concentrations. Both wells are located in the western ditch at the west side property boundary. The sum of PFOS and PFOA was significantly lower in MW3 and MW4, but still exceeded the LHA.

In February 2019, the EPA LHA was exceeded in all four monitoring wells on the Site, confirming the 2018 results. Concentrations were again highest for PFOS and PFOA in MW2 (614 times the LHA) and MW1R, respectively.

The PFAS laboratory results of the on-Site monitoring wells confirms the presence of PFAS at the western perimeter of the property boundary. Additional site characterization and testing is necessary to determine the level and extent of PFOS/PFOA contamination in the soil, and shallow and deep groundwater tables at the Site perimeter and immediately downgradient to the north and west. This includes installing monitoring wells screened at shallow, interim, and deep intervals on and near the NAPA Site to determine the vertical and horizontal extent of the PFAS contamination. Continued annual monitoring of permanent wells will be required to determine PFAS concentration variations over time.



#### 7.0 CONCLUSIONS, AND RECOMMENDATIONS

**NORTECH** completed the October 2018 and February 2019 groundwater monitoring at the NAPA facility, 1937 Van Horn Road in Fairbanks, Alaska. Based on the historical research, field observations, laboratory results, and Site conditions, **NORTECH** has the following conclusions and recommendations:

Petroleum Hydrocarbon and VOC Contaminants of Concern

- VOCs were not detected in the four monitoring wells, including 12DBE and 123TCP
   12DBE and 123TCP have not impacted the shallow groundwater table
  - They should be eliminated as contaminants of concern
- DRO was not detected in MW3 or MW4
- Historical groundwater results show a progressive downward trend in petroleum hydrocarbon and VOC concentrations
- A No Further Action for additional petroleum fractions and VOC groundwater monitoring in the four monitoring wells should be considered

#### PFAS Contaminants of Concern

- Use of AFFF on the 2011 NAPA fire has affected on-site monitoring wells
   PFOS/PFOA concentrations were above the Action Level/LHA in all four wells
  - MW2 and MW1R at the western perimeter boundary had the highest concentrations, up to 614 times the LHA
  - Installation of temporary sampling points (TSPs) and permanent monitoring wells screened at three intervals on and near the NAPA Site is recommended
  - Long term monitoring of the permanent wells will be required

**NORTECH** recommends submitting this Report to ADEC as documentation of the 2018 PFAS monitoring well sampling and 2019 monitoring well resampling at the Site. We also recommend preparing and submitting a Work Plan to ADEC detailing the proposed method and procedures of installing soil borings, TSPs, and permanent groundwater MWs needed to complete the PFAS site characterization.



#### 8.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

**Julie Keener, PE,** is a Senior Environmental Professional for **NORTECH** and the Task Manager for this project phase. Ms. Keener completed graduate courses in Environmental Quality Engineering in addition to her Civil Engineering Bachelor of Science degree while studying at the University of Alaska Fairbanks. Ms. Keener is registered as both an Environmental and Civil Engineer in Alaska. She has nearly 30 years of experience with site characterization, remediation and long-term monitoring, feasibility studies, and remedial investigation.

Julie has authored and reviewed Spill Prevention Control and Countermeasure (SPCC) Plans, prepared work plans, field sampling plans, quality assurance and quality control plans, waste management plans, and health & safety plans. She has managed logistics of remote projects, developed corrective action plans, cost estimates, and conceptual site models, overseen underground storage tank (UST) closures.

**Susan L. Vogt, CPESC, CISEC,** is a Senior Professional for *NORTECH* and overall Project Manager for this Site. Ms. Vogt has nearly 30 years of experience in environmental science and compliance programs, with considerable recent specialization in storm water pollution prevention plans (SWPPP) and other storm water related work, including a Preliminary Drainage Plan (PDP) for the City of Tanana, SWPPPs for Great Northwest, Inc. and other contractors in the Fairbanks area, including within the City of Fairbanks, the Fairbanks North Star Borough, Ft. Wainwright, and Eielson Air Force Base. She has developed SWPPPs and/or completed SWPPP inspections on more than 60 construction and industrial sites; has extensive experience with underground storage tanks (UST Closure License #574) release investigations, site assessments, and contaminated property management.

Primary Author Signature

Julie Keener

Julie Keener, PE Senior Professional

Reviewer

Susan Vogt, CPESC, CISEC Senior Professional

# Appendix 1







# Appendix 2

# Table 1 October 2018 Groundwater Results Summary Detected Analytes and Analytes of Interest

Sample ID		MW-1R	MW-2	MW-3	MW-4	MW-44	EB-Napa VH
Analyte	ADEC Cleanup Level	West Ditch	West Ditch	SW Corner	SE Corner	Dup of MW-4	Equipment Blank
		Petrole	eum Fractior	ns (mg/L)			
DRO	1.5	NA	NA	0.566 U	0.588 U	0.600 U	0.556 U
			VOCs (µg/L	.)			
1,2-Dibromoethane	0.075	0.00500 U					
1,2,3-Trichloropropane	0.0075	<u>0.00250 U</u>					
Toluene	1100	NA	NA	1.00 U	1.00 U	1.00 U	3.02

#### Notes:

U	Analyte not detected at the listed limit of quantitation (LOQ)
<u>U</u>	LOQ is greater than the ADEC Cleanup Level; the reported Detection Limit (DL)
	is less than the Cleanup Level
NA	Analysis not performed
Shade	Analyte detected below the ADEC Cleanup Level
mg/L	milligrams per liter

μg/L micrograms per liter

	On-Site	Monitoring V	Vell Results	Summary - F	Per- and Poly	fluoroalkyl S	Substances (	(PFAS) by EF	PA 537				
	EPA							MW3			MW4		
Monitoring Well	Lifetime	MW1R	MW1R	MW2	MW2	MW3	MW3	(Dup)	MW3	MW4	(Dup)	MW4	MW4
	Health								RPD			RPD	
Date Sample Collected	Advisory	10/9/2018	2/13/2019	10/9/2018	2/13/2019	10/9/2018	2/13/2019	2/13/2019		10/9/2018	10/9/2018		2/13/2019
				F	PFAS (µg/L)								
Perfluorobutanoic acid	NE	0.0661 J	0.143	0.305	0.467	0.522	0.342	0.349	-2.03	0.0624	0.0595	4.8	0.0544
Perfluoropentanoic acid	NE	0.153	0.194	0.532	0.566	0.537	0.464	0.402	14.32	0.0899	0.100	14.6	0.0882
Perfluorohexanoic acid	NE	0.249	0.340	1.89	1.88	1.54	1.22	1.06	14.04	0.158	0.172	23.2	0.114
Perfluoroheptanoic acid	NE	0.0793	0.0668	0.365	0.396	0.174	0.200	0.204	-1.96	0.0294	0.0308	-14.9	0.0286
Perfluorooctanoic acid (PFOA)	**	0.461	0.222	1.05	0.853	0.0635	0.0588	0.0632	-7.21	0.091	0.134	7.7	0.0885
Perfluorononanoic acid	NE	0.123	0.0132	0.0283	0.0261 J	0.0137	0.00319 J	0.00321 J	NA	0.00675 J	0.00902	-28.8	0.00313 J
Perfluorodecanoic acid	NE	0.077 U	0.0038 U	0.080 U	0.021 U	0.0077 U	0.0038 U	0.0040 U	NA	0.008 U	0.0077 U	NA	0.0038 U
Perfluoroundecanoic acid	NE	0.0456 J	0.0038 U	0.080 U	0.021 U	0.00943	0.0038 U	0.0040 U	NA	0.008 U	0.0077 U	NA	0.0038 U
Perfluorododecanoic acid	NE	0.077 U	0.0038 U	0.080 U	0.021 U	0.0077 U	0.0038 U	0.0040 U	NA	0.008 U	0.0077 U	NA	0.0038 U
Perfluorotridecanoic acid	NE	0.077 U	0.0038 U	0.080 U	0.021 U	0.0114	0.0038 U	0.0040 U	NA	0.008 U	0.0077 U	NA	0.0038 U
Perfluorotetradecanoic acid	NE	0.077 U	0.0038 U	0.080 U	0.021 U	0.0077 U	0.0038 U	0.0040 U	NA	0.008 U	0.0077 U	NA	0.0038 U
Perfluorobutanesulfonic acid	NE	0.479	1.38	3.04	5.02	4.81	3.51	3.10	11.68	0.512	0.648	-23.45	0.523
Perfluoropentanesulfonic acid	NE	0.336	0.599	3.97	3.89	3.74	3.05	2.62	-56.26	0.248	0.277	-11.05	0.171
Perfluorohexanesulfonic acid	NE	5.59	4.13	23.5	19.0	5.59	6.00	5.74	30.04	1.14	2.15	-61.4	0.887
Perfluoroheptanesulfonic acid	NE	2.27	0.83	2.19	2.15	0.0539	0.0152	0.0161	92.90	0.0821	0.117	-35.06	0.119
Perfluorooctanesulfonic acid (PFOS)	**	23.8	16.9	24.8	42.2	0.355	0.0552	0.0580	33.91	0.431	0.772	-56.69	0.705
Perfluorononanesulfonic acid	NE	0.077 U	0.019 U	0.080 U	0.210 U	0.0077 U	0.0038 U	0.0040 U	NA	0.0080 U	0.0077 U	NA	0.0038 U
Perfluorodecanesulfonic acid	NE	0.077 U	0.019 U	0.080 U	0.210 U	0.0077 U	0.0038 U	0.0040 U	NA	0.0080 U	0.0077 U	NA	0.0038 U
PFOSA	NE	0.077 U	0.0038 U	0.080 U	0.0210 U	0.0077 U	0.0038 U	0.0040 U	NA	0.0080 U	0.0077 U	NA	0.0038 U
MeFOSAA	NE	0.190 U	0.015 U	0.200 U	0.0830 U	0.019 U	0.015 U	0.016 U	NA	0.020 U	0.019 U	NA	0.015 U
EtFOSAA	NE	0.190 U	0.015 U	0.200 U	0.0830 U	0.019 U	0.015 U	0.016 U	NA	0.020 U	0.019 U	NA	0.015 U
4:2 Fluorotelomer sulfonate	NE	0.190 U	0.015 U	0.200 U	0.0830 U	0.019 U	0.015 U	0.016 U	NA	0.020 U	0.019 U	NA	0.015 U
6:2 Fluorotelomer sulfonate	NE	0.355	0.202	0.531	0.257	0.0292	0.015 U	0.016 U	NA	0.112	0.167	-39.43	0.0952
8:2 Fluorotelomer sulfonate	NE	0.190 U	0.015 U	0.200 U	0.0830 U	0.019 U	0.015 U	0.016 U	NA	0.020 U	0.019 U	NA	0.015 U
Sum of PFOS and PFOA †	0.070	24.3	17.1	25.9	43.1	0.42	0.11	0.12		0.52	0.91		0.79
Notoo								•			•		
	micrograms	nor litor											
μ9/⊏		detected aboy	ve the listed r	eporting limit	(PL)								
0	Concontratio	n is ostimato	d botwoon th	eporting innit	(INL) mit and the le	vol of quantit	ation						
Shada		contration det	ected below t	the EDA Lifeti	ime Health A		allon Lifannlicable	<b>`</b>					
Rold		contration ov	ected below i	A Lifotimo Ho	alth Advisory		, il applicable	-					
NE		time Health A		tablished for t	this analyto								
IN∟ **			is compared	to EDA Lifetir	ne Health Ad	visory							
+	Sum calcula	ted in accord	ance with AD	EC March 20	10 Technical	Memorandun	n "Treatment	of Non-Deter	te and B	lank Detectio	ne in		
I	Dor and Dol	leu in accoru			ie"	Memoranuun	ii iieatiiieiit	of Non-Delet			/15 /11		
DEAG		y fluoroalkyl c	substances (r	Allalys	13								
DECISA	Perfluorooct	anesulfonami	ido										
MeEOSAA	2_(NLMothyd	nerfluoroosta	no cultonomi	da) acotio aci	id								
		pernuoroocla			iu ii								
EIFUSAA		anecultonia a		stad in the 20	18 equipmon	t blank at 0.0	0230 1 ug/l						
		a wara dataat	ad in the 201	8 field black	Parfluoronon	anoic acid 0	00230 J µy/L	and Perfluer	ooctanoo	sulfonic acid (		1	
			tod in the 201				0020 <del>4</del> 0 µg/L		oocianes		5.00440 J µg/	L	
	NO GELECTION	is were repor		a Qu sample	50								

Table 2

Relative Percent Difference; Not Applicable

RPD; NA

On-site PFAS Table v4

#### Historical Groundwater Results Summary

Monitoring Well MW1 - Detected Analytes and Analytes of Interest

Sample ID		MW01 D1	MW31 D1	MW1B	MW1 D2	MW11	MW1	MW1	MW1R	MW1R5	MW-1R
Well Location Relative to Building	ADEC Cleanup Level	West Ditch	West Ditch Dup	West Ditch	West Ditch	West Ditch Dup	West Ditch	West Ditch	West Ditch	West Ditch Dup	West Ditch
Date Sample Collected		6/13/11	6/13/11	9/29/11	4/1/13	7/23/13	11/19/13	10/1/14	9/27/17	9/27/17	10/9/18
Work Order		1118395	1118395	1118928	1137643	1138129	1138737	1148566	1178439	1178439	1189850
Analyte	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				Petrole	eum Fractio	ons					
GRO	2.2	0.100 U	0.100 U	1.18	0.100 U	0.100 U	0.100 U	0.100 U	NA	NA	NA
DRO	1.5	0.800 U	0.800 U	13.6	1.33	1.28	0.612 U	0.600 U	0.588 U	0.588 U	NA
RRO	1.1	0.500 U	0.500 U	0.644	0.543 U	0.500 U	0.510 U	0.500 U	NA	NA	NA
					VOCs <sup>1</sup>						
1,2,4-Trimethylbenzene	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
1,3,5-Trimethylbenzene	0.12	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
2 Butanone	5.6	0.0957	0.125	0.762	0.010 U	0.010 U	0.01 U	0.01 U	0.01 U	0.01 U	NA
2-Hexanone	0.038	0.01 U	0.01 U	0.0128	0.010 U	0.010 U	0.01 U	0.01 U	0.01 U	0.01 U	NA
4-Isopropyltoluene	NE	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
4-Methyl-2-pentanone	6.3	0.0326	0.0343	1.90	0.0238	0.010 U	0.01 U	0.01 U	0.01 U	0.01 U	NA
Benzene	0.0046	0.0004 U	0.00158	0.0536	0.00124	0.00346	0.00171	0.0006	0.0004 U	0.0004 U	NA
Chloroform	0.0022	0.001	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Ethylbenzene	0.015	0.001 U	0.001 U	0.02	0.001 U	0.00149	0.00396	0.001 U	0.001 U	0.001 U	NA
Isopropylbenzene	0.45	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Chloromethane	0.19	0.005 U	0.001 U	0.0137	0.00175	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Naphthalene	0.0017	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.01 U	0.001 U	0.001 U	NA
n-Butylbenzene	1.0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
n-Propylbenzene	0.66	0.001 U	0.001 U	0.00617	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
sec-Butylbenzene	2.0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
trans-1,2-Dichloroethene	0.36	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Styrene	1.2	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Tetrachloroethene	0.041	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Toluene	1.1	0.001 U	0.00135	0.121	0.001 U	0.00139	0.00107	0.001 U	0.001 U	0.001 U	NA
o-Xylene	NE	0.001 U	0.001 U	0.0213	0.001 U	0.00127	0.00322	0.001 U	0.001 U	0.001 U	NA
p & m-Xylene	NE	0.002 U	0.002 U	0.0512	0.002 U	0.00232	0.0074	0.002 U	0.002 U	0.002 U	NA
Xylenes (total)	0.19	0.003 U	0.003 U	0.0726	0.003 U	0.00359	0.01062	0.003 U	0.003 U	0.003 U	NA
					Glycols						
Ethylene Glycol	40	30 <sup>2</sup>	2 U	2 U	2 U	2 U	10 U	10 U	NA	NA	NA
Propylene Glycol	730	23 <sup>2</sup>	2 U	2 U	2 U	2 U	10 U	10 U	NA	NA	NA

#### Historical Groundwater Results Summary

#### Monitoring Well MW2 - Detected Analytes and Analytes of Interest

Sample ID		MW02	MW2B	MW2	MW2	MW2	MW2	MW22	MW2	MW-2
Well Location Relative to Building	ADEC Cleanup Level	West Ditch	West Ditch Dup	West Ditch	West Ditch	West Ditch	West Ditch	West Ditch Dup	West Ditch	West Ditch
Date Sample Collected		6/13/11	9/29/11	4/1/13	7/23/13	11/19/13	10/1/14	10/1/14	9/27/17	10/9/18
Work Order		1118395	1118928	1137643	1138129	1138737	1148566	1148566	1178439	189850
Analyte	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			Р	etroleum Fra	actions					
GRO	2.2	0.100 U	0.704	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	NA	NA
DRO	1.5	0.800 U	15.1	2.28	0.723	0.622 U	0.600 U	0.600 U	0.588 U	NA
RRO	1.1	0.500 U	0.714	0.500 U	0.500 U	0.518 U	0.500 U	0.500 U	NA	NA
				VOCs <sup>1</sup>						
1,2,4-Trimethylbenzene	0.015	0.001 U	0.001 U	0.001 U	0.001	0.001 U	0.001 U	0.001 U	0.001 U	NA
1,3,5-Trimethylbenzene	0.12	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
2-Butanone	5.6	0.100	0.21	0.01 U	0.0100 U	0.01 U	0.01 U	0.01 U	0.01 U	NA
2-Hexanone	0.038	0.01 U	0.01 U	0.01 U	0.0100 U	0.01 U	0.01 U	0.01 U	0.01 U	NA
4-Isopropyltoluene	NE	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
4-Methyl-2-pentanone	6.3	0.0313	0.151	0.0262	0.0100 U	0.01 U	0.01 U	0.01 U	0.01 U	NA
Benzene	0.0046	0.00134	0.0271	0.00224	0.00168	0.00219	0.00061	0.00071	0.00012 J	NA
Chloroform	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Ethylbenzene	0.015	0.001 U	0.0237	0.001 U	0.00439	0.001 U	0.0022	0.00236	0.001 U	NA
Isopropylbenzene	0.45	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Chloromethane	0.19	0.001 U	0.0172	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Naphthalene	0.0017	0.002 U	0.00342	0.002 U	0.002 U	0.002 U	0.01 U	0.01 U	0.001 U	NA
n-Butylbenzene	1.0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
n-Propylbenzene	0.66	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
sec-Butylbenzene	2.0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
trans-1,2-Dichloroethene	0.36	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Styrene	1.2	0.001 U	0.0046	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Tetrachloroethene	0.041	0.001 U	0.00151	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA
Toluene	1.1	0.00122	0.121	0.00209	0.00162	0.001 U	0.001 U	0.001 U	0.001 U	NA
o-Xylene	NE	0.001 U	0.0274	0.00455	0.00451	0.001 U	0.001 U	0.001 U	0.001 U	NA
p & m-Xylene	NE	0.002 U	0.069	0.00780	0.00859	0.002 U	0.00239	0.00255	0.00068 J	NA
Xylenes (total)	0.19	0.003 U	0.0964	0.0124	0.0131	0.003 U	0.00301	0.00316	0.003 U	NA
				Glycols	5					
Ethylene Glycol	40	2 U	2 U	2 U	2 U	2 U	10 U	10 U	NA	NA
Propylene Glycol	730	2 U	2 U	2 U	2 U	2 U	10 U	10 U	NA	NA

#### Historical Groundwater Results Summary

Monitoring Wells MW3 and MW4 - Detected Analytes and Analytes of Interest

Sample ID		MW3	MW3	MW3	MW-3	MW4	MW40	MW4	MW4	MW-4	MW-44
Well Location Relative to Building	ADEC Cleanup Level	SW Corner	SW Corner	SW Corner	SW Corner	SE Corner	SE Corner Dup	SE Corner	SE Corner	SE Corner	SE Corner Dup
Date Sample Collected		11/19/13	10/1/14	9/27/17	10/9/18	11/19/13	11/19/13	10/1/14	9/27/17	10/9/18	10/9/18
Work Order		1138737	1148566	1178439	1189850	1138737	1138737	1148566	1178439	1189850	1189850
Analyte	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				Petr	oleum Fract	ions					
GRO	2.2	0.100 U	0.100 U	NA	NA	0.100 U	0.100 U	0.100 U	NA	NA	NA
DRO	1.5	0.600 U	0.600 U	0.588 U	0.566 U	0.600 U	0.600 U	0.600 U	0.577 U	0.588 U	0.600 U
RRO	1.1	0.500 U	0.500 U	NA	NA	0.500 U	0.500 U	0.500 U	NA	NA	NA
			-		VOCs <sup>1</sup>				-		
1,2,4-Trimethylbenzene	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
1,3,5-Trimethylbenzene	0.12	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
2-Butanone	5.6	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
2-Hexanone	0.038	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
4-Isopropyltoluene	NE	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
4-Methyl-2-pentanone	6.3	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzene	0.0046	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
Chloroform	0.0022	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Ethylbenzene	0.015	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Isopropylbenzene	0.45	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Chloromethane	0.19	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Naphthalene	0.0017	0.002 U	0.002 U	0.001 U	0.001 U	0.002 U	0.01 U	0.01 U	0.001 U	0.001 U	0.001 U
n-Butylbenzene	1.0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
n-Propylbenzene	0.66	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
sec-Butylbenzene	2.0	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
trans-1,2-Dichloroethene	0.36	0.001 U	0.001 U	0.00039 J	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Styrene	1.2	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tetrachloroethene	0.041	0.001 U	0.001 U	0.001 U	0.001 U	0.0028	0.00292	0.0111	0.00129	0.001 U	0.001 U
Toluene	1.1	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
o-Xylene	NE	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
p & m-Xylene	NE	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Xylenes (total)	0.19	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
					Glycols						
Ethylene Glycol	40	10 U	10 U	NA	NA	10 U	10 U	10 U	NA	NA	NA
Propylene Glycol	730	10 U	10 U	NA	NA	10 U	10 U	10 U	NA	NA	NA

#### Historical Groundwater Results Summary

#### Notes:

U	Analyte not detected at the listed limit of quantitation (LOQ)
NE	Cleanup Level not established
Shade	Analyte detected below the ADEC Cleanup Level
Bold	Analyte detected exceeding the ADEC Cleanup Level
1	Refer to Table 1 for October 2018 for 1,2-dibromoethane and 1,2,3-trichloropropane results
2	On June 30, 2011, MW1 was sampled for glycols with Ethylene Glycol at 170 mg/L and Propylene Glycol at 140 mg/L
NE	ADEC groundwater cleanup level not established
mg/L	milligrams per liter
NA	Analysis not performed

# Appendix 3



**Field Activity Log** 

Date  $\frac{co/8/18}{6\pi}$ Staff  $\frac{60111a}{5}$   $\frac{60111}{6}$   $\frac{60111}{6}$   $\frac{60111}{6}$   $\frac{60111}{6}$ 1035F Weather: Clean, 25°F, Calm Project ID /7-1001 Safety Topics: <u>Slips trajs fails</u> Length: <u>15 mm</u>, Page of 1130- HARNE SITE - Setup at Alaska Druguns, Drc SITE TO Sample HWF. Decon-Lourspine free warner from Cobs, 1500 - HWA appears to have been pumped dury Approx, 35 galling of pange water numoved Wast 30 mins for well to rechamp 1530 - Well day - could not collect sample, Will allow poell to Recharge overnight Astudge bortom of well 1610 - Depanted Site 1435 - Return To office / dunch 1645 - Don . William L. Watte

Page \_\_\_\_\_\_ of \_\_\_\_\_



Field Activity Log

Weather: Mostly Sunny, 105-305 Staff SWH Project ID 17-1021 Safety Topics: GW - POL & PEPErs Length: 5 mins Page 1 of 1 O830 pack truch and calibrate YSE Pur Plus DSS 0945 anire at HW-1 to assess well's recharge from being purged dry and having insufficient recharge from 10/8/18 attempted sampling. Bailer used to cample fully recharged nell after well was left undisturbed overnight. 1020 communicate with owner/menagers of Napa and adjacent preparty regarding gw sampling MW-2, MW-1R, MW-3 Disenssed w/ katie @ Napa (Am manager) regarding disposed of 2017 GW Purge water after down is thamed inside shop.
Project ID <u>17-1021</u> Safety Topics: <u>GW - POL i PEPPCs</u> Length: <u>5 mins</u> Page <u>1</u> of <u>1</u> <u>0830 pack truck and calibrate YSE PwPlus DSS</u> <u>0945 arrive at Hw-1 to assess well's recharge from being</u> <u>purged dry and having insufficient recharge from 10/8/18 attempted</u> <u>sampling</u> . Bailer used to cample fully recharged nell after well was left undesturbed overnight. <u>1020 communicate with owner/menagers of Napa and adjacent</u> <u>property regarding gw sampling MW-2</u> , MW-1R, MW-3 <u>Disenssed w/ Katie @ Napa (Att manager) regarding disposed</u> <u>of 2017 Gw Purge water after drum is thawed inside shop</u> .
Safety Topics: <u>GW - POL &amp; PEPCS</u> Length: <u>5 mins</u> Page <u>1</u> of <u>1</u> <u>0830</u> pack truck and calibrate YSE Pro Plus DSS <u>0945</u> arrive at HW-1 to assess well's vectorage from being <u>purged day and having insufficient recharge from 10/8/18</u> attempted <u>sampling</u> . Bailer used to cample fully recharged well after well was left undisturbed overnight. <u>1020</u> communicate with owner/menagers of Napa and adjacent <u>property regarding gw sampling MW-2</u> , MW-1R, MW-3 <u>Discussed w/ Katie @ Napa (Am manager) regarding disposed</u> <u>of 2017 GW Purge watur after drum is thawed inside shop</u> .
0830 pack truck and calibrate YSE ProPlus DSS 0945 arrive at HW-1 to assess well's recharge from being purged dry and having insufficient recharge from 10/8/18 attempted sampling. Bailer used to cample fully recharged well after well was left undesturbed overnight. 1020 communicate with owner/menagers of Napa and adjacent -property regarding gw campling MW-2, MW-1R, MW-3 Disenssed w/ Katie @ Napa (Att manager) regarding disposed of 2017 GW Purge water after drym is thanked inside shop.
0830 pack truck and calibrate YSE ProPlus DSS 0945 arrive at HW-1 to assess well's recharge from being purged dry and having insufficient recharge from 10/8/18 attempted sampling. Bailer used to cample fully recharged well after well was left undesturbed overnight. 1020 communicate with owner/managers of Napa and adjacent property regarding gw sampling MW-2, MW-1R, MW-3 Disenssed w/ Katie @ Napa (Att manager) regarding disposed of 2017 GW Purge water after drum is thaweel inside shop.
0945 arrive at HW-1 to assess well's recharge from being purged dry and having insufficient recharge from 10/8/18 attempted Sampling. Bailer used to cample fully recharged well after well was left undisturbed overnight. 1020 communicate with owner/menagers of Napa and adjacent property regarding gw campling MW-2, MW-1R, MW-3 Disenssed w/ katie @ Napa (Att manager) regarding disposed of 2017 GW Purge water after down is thawed inside shop. 1046 begin Napa Gw sampling.
purged dry and having insufficient recharge from 10/8/18 attempted sampling. Bailer used to cample fully recharged nell after well was left undisturbed overnight. 1020 communicate with owner/menagers of Napa and adjacent property regarding gw campling MW-2, MW-1R, MW-3 Disenssed w/ Katie @ Napa (Att manager) regarding disposed of 2017 GW Purge water after drum is thawed inside shop. 1046 begin Napa Gw sampling.
Sampling. Bailer used to sample fully recharged well after well was left undisturbed overnight. 1020 communicate with owner/menagers of Napa and adjacent property regarding gw sampling MW-2, MW-1R, MW-3 Discussed w/ katie @ Napa (Atm manager) regarding disposed of 2017 GW Purge water after drum is thanked inside shop. 1046 begin Napa Gw sampling.
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Discussed w/ Katie @ Napa (Atm manager) regarding disposed of 2017 GW Purge water after drum is thanked inside shop. 1046 begin Napa Gw sampling.
of 2017 GW Purge water after drum is thanked inside shop. 1046 begin Napa Gw sampling.
1046 begin Nape Gw sampling.
initial purge collected prior to parameters. V. turbed water in
wells prior to sampling.
No complications during sampling.
1600 depart site for SGS drup-off of samples.
Approx. 155 gallons PW collected for samples. draw will be
moved inside to them prior to disposel.
625 samples turned in. Truck unpached at ottice
For off field aspect.
pluches was a company of contract of the of P
Q Ales V II - PW was transford to a 250 willing
Lot al disserved of a NRC Alacka
tore and apposed of & Mic Millsrea.

Page \_\_\_\_\_ of \_\_\_\_



1330

#### **Groundwater Sample Form**

	NAPA	1		_	Site Location:	Van Hen	in F	acili	77
Project #:	17-10	01			Well Number:	HWI			-
Water Colu	umn	Pre-Purge	Post-Purge: (on	ly need to be col	lected if field staff have	sufficient belief these r	measurements	have chan	ged)
Total Depth of	f Well (ft):	~35	~36		Water Level Measure	ement Date:	10/0	118	
Depth to Prod	uct from TOC (ft):	NA	N/A		Water Level Measure	ement Time:	1019	5	
Depth to Wate	er from TOC (ft):	~ 10	10.30		WL Instrument & S/N	Int Pro	be	10	33
Column of Wa	ater in Well (ft): 🏊	25	~26		Depth Pump Deploye	ed At (ft):	Tubing Use	ed (ft):	-(100
Purge Info	rmation	Private well	Well Diameter (in)	Volume (gal/ft)	TOM-GS (ft):	flush	тос-том	(ft):	one.
Gallons/foot o	f Well Casing:	1.47	1 3/4 "	0.13	Purge Method:	ub pump w/	contro	Ner	
Column of Wa	ater in Well (ft):	x 25'	2 "	0.17	Est. Flow Rate (ga	l/min): <u>//</u> Devel	opment Tot. V	/ol (gal):	35
Vol. of Water	in Well (gal): ~	= 35	4"	0.66	Purge Water Disposa	al: NRC Alma	sha - c	drop c	,66
Field Parame	ters	Purge Start Tim	e: 1300	Purge End time	: <u>1530</u> то	otal Volume Removed (	gal):~	35	
Time	Temperature	Dissolved O <sub>2</sub>	Conductivity	pH I+ 0.1 pH units]	ORP	Visual Clarity	Odor (Y/N)	Sheen	Removed Vol (gal)
(24-111)	[10.5 0]	[± 10 % mg/t]	[2.5% μ0/6//]		[110 IIIV]	(00001100)		(,	
-	0	here		ant					1
PI	reged	1	Jolop H		~ W	1.			
10		and d	eve		vermo				
1	dur	11-2	1	ne a	2			-	
di	m -	1	reche	70					
		Slow	2						
N	100000			Q.					
Н		1 121	Purge						
		1 00							
			1	1.00	1	4.1 . Ph		. 1	0
Water Quality Sample Inf	Meter & S/N:	N/A - S	low rech	lange	Purge Notes:	e one): Stable paran	neters or	> 3 Well	Vol. Purged
Sample Date	10/9/1	8			Sample ID:	11-1-1		Time: )	0:05
Sampler/e):	Swat				Field Dup ID:	NIA		Time:	-
Sample Math	ad haled				Equin Blank ID:	NIA		Time:	-
Sample weth	ou. <u>Source</u>				Equip Blaint 123				
Laboratory An	alyses: 🛛 DRO/F	RO (AK102/103	); 🛛 GRO/BTEX (A	K101 / EPA 802	1B); 🛛 PAH (EPA 8270	OD SIM); I VOC EPA	8260; 🖌	PFOA/	PFOS
	on Notes: 🕅	ell cap	nor	Secur	ie, Dier	idebnis s	subject	F 70	
Well Conditio		(ling m	ro well.	1	/		V		
Well Conditic	ies: fa	and the second	10-	2 7 2	mound Su	"face			
Well Conditic Casing Not Monument	Notes: M	onumen	7 Plusi	10 7					
Well Conditic Casing Not Monument Notes & Com	Notes: Ma ments: Prove	onument	7 Flust	AL MAL	ND for PU	12.			
Well Conditic Casing Not Monument Notes & Com	notes: 17 Notes: 17 noments: Prod	mumen Nons se	mpling ne	Al was	ND for Pu	12.			
Well Conditic Casing Not Monument Notes & Com	es: <u>fa</u> Notes: 197 mments: Pres	mument nons se	mpling ne	Al was	ND for Pu	12.			
Well Conditic Casing Not Monument Notes & Com	es: <u>fa</u> Notes: <u>Ma</u> mments: Pres	mumen nons sc ann. n	rell 1.	47 5-	ND For PO	ıL.			



Project #: 17-1001					Well Number: <u>mw - 1R</u>						
Water Colu	mn	Pre-Purge	Post-Purge: (onl	y need to be colle	ected if field staff ha	ave sufficient belief these i	measurement	s have chan	ged)		
Total Depth of	Well (ft):	~20.5	20.48		Water Level Meas	urement Date:	10/0	9/18	-5		
Depth to Produ	ct from TOC (ft):	NIA	NIA		Water Level Meas	urement Time:	12	10			
Depth to Water	from TOC (ft):	~ 10.	10.26		WL Instrument & S	SIN: Int Probe	e	103	3		
Column of Wat	er in Well (ft):	~10	10.22		Depth Pump Deplo	oyed At (ft): ~ 12	Tubing Use	ed (ft):	25		
Purge Infor	mation		Well Diameter (in)	Volume (gal/ft)	TOM-GS (ft):	3,28	_тос-том	(ft):	39		
Gallons/foot of	Well Casing:	0.17	1 3/4 "	0.08	Purge Method:	Sinb pump	N con	maller			
Column of Wat	er in Well (ft):	x ~10	2"	0.17	Est. Flow Rate	(gal/min): <u>2</u> Deve	lopment Tot. V	Vol (gal):	4		
Vol. of Water in	n Well (gal):	= 1.74	4"	0.66	Purge Water Disp	osal: Nizc Alas	re Dru	p-off			
Field Paramet	ers	Purge Start Tim	e: 1231	Purge End time:	1247	Total Volume Removed (	(gal):	30			
Time	Temperature	Dissolved O <sub>2</sub>	Conductivity	pН	ORP	Visual Clarity	Odor	Sheen	Removed		
(24-hr)	[±0.5 °C]	[± 0.1 mg/L]	[± 3% µS/cm]	[± 0.1 pH units]	[±10 mV]	( observed )	(Y/N)	(Y/N)	vor (gal)		
1234	9.0	0.24	165.8	6.51	-22.8	clear	~	~			
1237	9.0	0.19	166.1	6.52	-14.7				a.		
1240	9.0	6.17	165.9	6.54	-15.4	<u>.</u>		-	-		
1243	9.0	0.17	164.8	6.35	- 9.9	14			-		
1246	9.0	0.17	166.3	6.35	-4.8	3.5	V	et .			
1248	Sample	time				~	N	N			
							-	_			
	[										
								P			
Nater Quality I	Veter & S/N: ¥	ST Dry DS	S 17E10	1936	Purge Notes:	unbiel to d	ear				
Sample Inf	ormation			1	Sample Criteria (c	ircle one): Stable parar	meters or	> 3 Well '	Vol. Purged		
Sample Date:	10/9	118			Sample ID:	mw-IR		Time: 12	248		
Sampler(s): SWH					Field Dup ID:	NIA		Time:	-		
Sample Method: Sub puns of controller					Equip Blank ID:	NIA	Time:				
		)				1700	2				
_aboratory Ana	alyses: 🗆 DRO/f	RRO (AK102/103	); 🛛 GRO/BTEX (A	K101 / EPA 8021	IB); □ PAH (EPA 8	270D SIM); VOC EPA	8260;	PPOA/PI	es s		
Vell Conditio	n Notes:										
Casing Note	es: good				4						
Monument I	Notes: acr	d			_						
Notes & Com	ments:	. potente	é duchid	des in	itral sur	c cleared	after .	wonger	10 m		
	VCC	A grange	A NINE D.W.		1 0			10			



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Project:	Napa	GW in	vestigetr	-	Site Location:	Napa - Vas	. Her	n	-		
Project #:	17-	1001			Well Number: Mw-Z						
Water Colu	ımn	Pre-Purge	Post-Purge: (on	ly need to be col	lected if field staff ha	ave sufficient belief these m	easurement	's have chan	ged)		
Total Depth of	Well (ft):	- 20.91	20.93		Water Level Meas	urement Date:	10/	9/18			
Depth to Product from TOC (ft): V					Water Level Meas	urement Time:	12:	11	-		
Depth to Water from TOC (ft): ~11.5 10.59 V					WL Instrument & S	S/N: Int Prob	e.	10	133		
Column of Wa	tter in Well (ft):	~ 9.5	10.34		Depth Pump Deplo	oyed At (ft): <u>~ 20</u>	Tubing Use	ed (ft): 2	5+ 15 pm		
Purge Info	rmation		Well Diameter (in)	Volume (gal/ft)	TOM-GS (ft):	3.45	тос-том	(ft):	-		
Gallons/foot of	f Well Casing:	0.08	1 3/4 "	0.08	Purge Method:	Sub pump n	11 son	ntrolle	r		
Column of Wa	ter in Well (ft):	x 9.5	2"	0.17	Est. Flow Rate	(gal/min): Develo	pment Tot. '	Vol (gal):	15		
Vol. of Water i	n Well (gal):	= 0.76	4"	0.66	Purge Water Dispo	osal: NRC ALA	sha	Drop	490		
Field Deremot	tora	Durge Start Tim	. 1131	Burgo End time	1142	Total Volume Removed (a	al). ~	30			
Time	Temperature	Dissolved O <sub>2</sub>	Conductivity	pH	ORP	Visual Clarity	Odor	Sheen	Removed		
(24-hr)	[±0.5 °C]	[± 0.1 mg/L]	[±3% µS/cm]	[± 0.1 pH units]	[ ±10 mV ]	( observed )	(Y/N)	(Y/N)	Vol (gal)		
1134	9.6	0.41	417:2	6.50	-7.5	sl. turbicl	1				
1137	9.0	0.26	415.5	6.52	-27.7	clear.					
1140	9.0	0.21	414.2	6.53	-37.4	clear		/	*		
1143	9.0	0.18	410.2	6.54	-43.8	clear					
1146	9.0	0.16	409.6	6.55	-49.2	clear					
1148	Samole	time -		4		clear.	N	N			
	.a										
-											
				-							
							/				
Water Quality	Meter & S/N:	ISI pro DS	S IFEIG	1936	Purge Notes:	bipump w/ c	untrull	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	(al Durgod		
Sample Inf	ormation	1.0			Sample Criteria (ci	ircle one): Stable parame	eters or	> 3 VVell	Vol. Purgeo		
Sample Date:	10/9	110			Sample ID:	MW-2		Time:	198		
Sampler(s): _	SWA				Field Dup ID:	NA		Time:			
Sample Metho	od: <u>sub</u>	pinpul	controller		Equip Blank ID:	NIA		Time:	-		
						, sim	1	oral	100 577		
Laboratory Ana	alyses:  DRO/I	RRO (AK102/103	); 🛛 GRO/BTEX (A	K101 / EPA 802	1B); 🗆 PAH (EPA 8	270D SIM); d VOC EPA 8	260; 🖬	PPOAT	105 35+		
Well Conditio	n Notes:			1-11							
Casing Note	es: good	- namou	dianeto	~13/4				·			
Monument I	Notes: no	monume	mt								
Notes & Com	ments: San	-pled for	voc 8	8260 SI	m 1,2-d	ibnom bethane &	1,2,3-	trich	lunipropere		
				21							
					-			•			



Project #: Well Number: Well Number:	
Water Column Pre-Purge Post-Purge: (only need to be collected if field staff have sufficient belief these measurements have changed	1)
Total Depth of Well (ff):         ~17         17.02         Water Level Measurement Date:         10/9/18	
Depth to Product from TOC (ft): Water Level Measurement Time: 351	
Depth to Water from TOC (ft): 8.73 WL Instrument & S/N: Probe 1033	
Column of Water in Well (ft): 8.29 Depth Pump Deployed At (ft): 710 Tubing Used (ft): 25	<u> </u>
Purge Information Well Diameter (in) Volume (gal/ft) TOM-GS (ft): TOC-TOM (ft):	2
Gallons/foot of Well Casing: 0.17 13/4" 0.08 Purge Method: Sub pump of confronter	
Column of Water in Well (ft): x 8-29 2" 0.17 Est. Flow Rate (gal/min): 1 Development Tot. Vol (gal): 1	2
Vol. of Water in Well (gal): = 1.41 4" 0.66 Purge Water Disposal: NRC Alasha Drop off	
Field Parameters Purge Start Time: 1322 Purge End time: 1340 Total Volume Removed (gal): 25	
Time         Temperature         Dissolved O2         Conductivity         pH         ORP         Visual Clarity         Odor         Sheen         R           Time         Temperature         Dissolved O2         Conductivity         pH         ORP         Visual Clarity         Odor         Sheen         R	emoved
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	/or (gal)
1228 Q1 207 4071 617 - 42 4 4	
1221 5 6 6 6 100 6 6 7 -482 7	
1531 8.1 0.06 406.1 0.67	
1554 0.1 0.05 400.1 6.07 -53.5 ···	
1557 8-1 0.03 400.0 6.67 -36.1	
1541 Sample time	
	2
	2
Water Quality Meter & S/N: 1SI prodSS 17E101936 Purge Notes: Inbid to clear	Dummed
Sample Information Sample Criteria (circle one): Stable parameters or > 3 Well Vol.	Purged
Sample Date: 10/9/18 Sample ID: MW-S Time: 159	11
Sampler(s): SMA Field Dup ID: N/A Time:	+ Heal
Sample Method: Monther Equip Blank ID: Time: T1	11-10-
Laboratory Analyses: # DRO/BRO (AK102/100): GRO/BTEX (AK101 / EPA 8021B): PAH (EPA 8270D SIM): VOC EPA 8260; PFOA /PFo	15 53
Well Condition Notes:	
Casing Notes:	
Monument Notes:	
Notes & Comments:	
· ·	



Project:	Napa	Gw in	restigation	-	Site Location	Napa - V.	an He	ann	
Project #:	17-10	100		-	Well Number:	mm-4			-
Water Colu	imn	Pre-Purge	Post-Purge: (on	ly need to be colle	ected if field staff h	ave sufficient belief these n	neasuremen	's have chan	ged)
Total Depth of	Well (ft):	~ 17.7	18.01		Water Level Meas	surement Date:	10/0	1/18	
Depth to Produ	uct from TOC (ft)	-			Water Level Meas	surement Time:	14	32	
Depth to Wate	r from TOC (ft):	~8-5	8.59		WL Instrument &	S/N: Int prube		2201	<u> </u>
Column of Wa	ter in Well (ft):	~ 9	9.42		Depth Pump Depl	loyed At (ft):	Tubing Us	ed (ft):	30
Purge Info	rmation		Well Diameter (in)	Volume (gal/ft)	TOM-GS (ft):	flush	тос-том	(ft): 🧷	48
Gallons/foot of	Well Casing:	6.17	1 3/4 "	0.08	Purge Method:	sub pump v	ví co	nholler	-
Column of Wa	ter in Well (ft):	× 9.42	2"	0.17	Est. Flow Rate	(gal/min): A Develo	opment Tot.	Vol (gal):	15
√ol. of Water i	n Well (gal):	= 1.60	4"	0.66	Purge Water Disp	osal: NRC Blas	he .	- Drup	-off
Field Paramet	ters	Purge Start Tim	e: 1458	Purge End time:	1514	Total Volume Removed (	al): ~4	0	
Time	Temperature	Dissolved O <sub>2</sub>	Conductivity	рН	ORP	Visual Clarity	Odor	Sheen	Removed
(24-hr)	[±0.5 °C]	[± 0,1 mg/L]	[±3% µS/cm]	[± 0.1 pH units]	[±10 mV]	( observed )	(Y/N)	(Y/N)	Vol (gal)
1501	5.1	0.09	332.6	6.63	-41.1	sl. tubid	N	N	
150.4	5.2	6.07	331.6	6.63	-43.6	clear	1	1	-
1507	5,2	0.06	331.9	6.63	-45,8	11			+
1570	5,2	0.06	331,9	6.63	-47.5	1			
1513	5.2	0.04	332.1	6.62	-49.1				
1515	Samo	k for	e C			clear.	1	A A	
_	1	_							-
			•			-			
							-	D)	
		so i di	170	10076	2 / June 4 (1	ind black t		-	
Nater Quality	Meter & S/N: Y	st prices	175	101931	Purge Notes:	ircle one): Stable param	eters or	> 3 Well \	/ol. Puraed
Sample Date:	iolalis	×			Sample ID:	MW-4		Time:	EIS-
ample Date.	Sinth				Field Dup ID:	MINI- 44	Time: 15-25		
sampier(s): _		1	1 11-0		Field Dup ID.				
sample Metho	od: <u>See 7</u>	ump we	Controlla		Equip Blank ID:			rime.	
aboratory Ana	alyses: DRO/I	REO (AK102/103	); 🗆 GRO/BTEX (A	K101 / EPA 8021	B); 🖬 PAH (EPA 8	3270D SIM); VOC EPA	3260;	FCs (PFe	A/PFos)
Vell Conditio	n Notes: Go	vel							
Casing Note	es: good								
Monument N	Notes: remar	red more	bentomicht	to aiv	re casine	cap some de	aranie		
	ments:		in or	9.1					
Notes & Com									


### Field Activity Log

	Date 2-13-19
Weather: overcast, windy ~ 10s	Staff Swith www
	Project ID 17-1001
Safety Topics: PFe - ultra sensative analysis Length:	Page of
0830 seek truck, calibrate YSI (passed)	
1000 depart for site (Napa-Van Hurn)	
1030 arrive, site welk-mend, get instruction	ms f_ PW holding and
underted Katie w/ PFC - Res Search / san	-pling documents.
1100 begin at up gradient well MW-4	
ac sampling a mw-3	-
pump had Enozen plug after CB sampling	Buck before continueing
Sampling. Sampled MW. 22 and MW-IR W	I no complications.
1530 clean-up. Drum left by MW-4 on	pallet for Napa
to more if desired. Dram nes labelled.	ADDITUX 40 callons.
1600 drive to SGS - office closed for wint	er hours. Return
to office for unpacking truck.	
1700 off project - No complications during	sempling.
dropped off samples a SGS following day	. Jun
, , , , , , , , , , , , , , , , , , , ,	
	AN

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Project:	Napa C	SW PFC	<i>.</i>		Site Location	Napa Van	Horn	, Fbx	AK
Project #:	17-10	101			Well Number:	mw-1R	_		
Water Colu	umn	Pre-Purge	Post-Purge: (on	ly need to be coll	ected if field staff h	ave sufficient belief these n	neasurement	's have chan	ged)
Total Depth of	Well (ft):	21	1		Water Level Meas	surement Date:	2/1	3/19	_
Depth to Prod	uct from TOC (ft)				Water Level Meas	surement Time:	13	51	2.7
Depth to Wate	er from TOC (ft):	13.2			WL Instrument &	s/N: steel ta	pe m	casur	
Column of Wa	ter in Well (ft):	6.8	<u>\</u>		Depth Pump Depl	oyed At (ft):	Tubing Us	ed (ft):	50
Purge Info	rmation	1	Well Diameter (in)	Volume (gal/ft)	TOM-GS (ft):	3.28	тос-том	(ft):	.39
Gallons/foot of	f Well Casing:	0.17	1 3/4 "	0.13	Purge Method:	sub pump	w/ co	mtroll	~
Column of Wa	ter in Well (ft):	x 6.8	2"	0.17	Est. Flow Rate	(gal/min): 0.5 Develo	opment Tot.	Vol (gal):	4.5
Vol. of Water i	n Well (gal):	= 1.16	4"	0.66	Purge Water Disp	osal: <u>Container</u>	ibe an	el hol	d onsit
Field Parame	ters	Purge Start Tim	e: 1411	Purge End time:	1433	Total Volume Removed (	gal):	3	
Time	Temperature	Dissolved O <sub>2</sub>	Conductivity	рН	ORP	Visual Clarity	Odor	Sheen	Removed
(24-hr)	[±0.5 °C]	[± 10% mg/L]	[±3% µS/cm]	[± 0.1 pH units]	[±10 mV]	( observed )	(Y/N)	(Y/N)	Vol (gal)
1421	4.8	0.19	243,7	6.87	-46,6	Sh forbal	N	N	6
1424	4.8	0.12	243.9	6.88	" 47,5	cleat	N	N	9.5
1427	4.8	0.09	243.7	6.85	-45.5	(1	N	~	11
1430	4.9	0.09	244.5	6.83	-44.0	4	N	N	11.75
14 33	4.8	0,09	245.1	6.80	-42.6	15	N	N	13
1434	Samo	e time				clear	N	N	-
							1		
	-		-						
								X	
L					V.	terpict - 1		- @	r
Water Quality	Meter & S/N: 为	ISE ProDS	SS 17E1	01936	Purge Notes:	orange instally	- cle	areal a	7.
Sample Inf	ormation				Sample Criteria (c	ircle one): Stable param	eters or	> 3 Well Y	/ol. Purged
Sample Date:	2/13/	19			Sample ID:	MW-IR		Time:	39
Sampler(s):	SWA , 1	NLW			Field Dup ID:	N/A		Time: -	-
Sample Metho	od: cubpi	my w/ c	ontroller		Equip Blank ID:	NIA		Time:	-
								PECS	
Laboratory Ana	alyses: DRO/	RRO (AK102/103	); 🛛 GRO/BTEX (A	K101 / EPA 8021	B);	3270D SIM); D VOC EPA 8	3260;	EPA	55+
Well Conditio	n Notes:						_	-	
Casing Note	es: goud								
Monument I	Notes: Guru	d - no	monumer	at lid					
Notes & Com	ments: Fid	d blank	collected	from S	GS Provid	ed "PEC-free	DI	water	16
	Field B	lank W	: Field Bla	nk-1 2	haling a	1400			
		IL.							



Project #:       T-LOOL       Well Number:       Mw-2         Water Column       Pre-Purge       Post-Purge: (any need to be collected if field staff have sufficient belieft be	Project:	Napa	GW -i	PECS	-	Site Location	Napa Van	Hor	~	-
Water Column       Pre-Purge       Post-Purge: (only need to be collected if hold shift have sufficient basted times measurements have changed         Trid Depth of Well (ft):       2.1       Water Level Measurement Date:       2.113.19         Depth to Product from TOC (ft):       13.4       Water Level Measurement Date:       151.0         Depth to Weater from TOC (ft):       13.4       Water Level Measurement Time:       151.0         Depth to Weater from TOC (ft):       13.4       Water Level Measurement Time:       151.0         Outime of Weater in Well (ft):       7.6       Depth Pump Depoyed AI (ft): ^1.9       Tubing Used (ft):         Gations/foot of Weil Casing:       0.13       2 <sup>2</sup> 0.17       ToM-GS (ft):	Project #:	17-10			-/	Well Number	- mw-2			-
Total Depth of Well (9):       24       Water Level Massurement Date:       21/3/19         Depth to Product from TOC (10):       13:4       Water Level Massurement Date:       15:10         Depth to Product from TOC (10):       13:4       Water Level Massurement Date:       15:10         Column of Water in Well (10):       7.6       Depth Pump Deployed At (10): 214       Tubing Used (11):       700         Purge Information       0.13       (134' 0.13)       Depth Pump Deployed At (10): 214       Tubing Used (11):       2.144         Calumn of Water in Well (12):       X. Z. (2       0.17       134' 0.13       Ext Flow Rate (gal/min):       0.5       Development Tot. Vol (gal):       2.144         Purge Mater in Well (12):       X. Z. (6       2.'       0.17       Ext Flow Rate (gal/min):       0.5       Development Tot. Vol (gal):       2.164         Field Parameter       Purge Stat Time:       15.08       Purge End time:       15.02       Total Voluma Removed (gal):       10         Time       Tomperture       Dissolved 0,       Conductivity       PH       ORP       Visual Clarify       Odd       State: anth 1         15.15       S. O       O. OS       35.65       G. C. A       A       A       A       A       A         15.15       <	Water Colu	ımn	Pre-Purge	Post-Purge: (on	ly need to be col	llected if field staff h	ave sufficient belief these	measuremen	ts have char	nged)
Depth to Product from TOC (ft):       13:4       Viater Level Measurement Time:       1510         Depth to Water from TOC (ft):       13:4       Depth to Water from TOC (ft):       13:4       Depth Pump Deployed AI (ft):       14:0         Purge Information       Well Dismedia: 201-10       Tob. CS (ft):       Tob. CS (ft):<	Total Depth of	Well (ft):	21			Water Level Meas	surement Date:	2/1	3/19	-
Depth to Water from TOC (ft): $12.4$ Will Instrument & SR:       Steed type measure         Column of Water in Well (ft): $7.6$ Depth Pump Deployed At (ft): $419$ Tubing Under (ft): $3146$ Purge Information       (144)       0.13       Column of Water in Well (ft): $7.6$ Depth Pump Deployed At (ft): $419$ Tubing Under (ft): $3146$ Calumn of Water in Well (ft): $x$ $7.6$ 0.13       Columnation (ft): $1144$ 0.13         Calumn of Water in Well (ft): $x$ $7.6$ 0.88       Purge Mater Disposal:       Contrulture       Est Flow Rate (gal/min): Q.S.       Development Tot Vel (gal): 2         Purge Water in Well (ft): $x$ $7.6$ 0.88       Purge End time:       152.5       Total Volume Removed (gal):       10         Field Parmeture       Dissing Unit Time:       15.08 $6.64$ $-27.5$ $7.6$ $N$ $2$ IS 12       S.O       0.07       356.35 $6.64$ $-31.0$ $11$ $N$ $N$ $2$ IS 12       S.O       0.07       356.45 $6.64$ $-31.0$ $11$ $N$ $N$ $2$ IS 12.5	Depth to Produ	uct from TOC (ft)				Water Level Meas	surement Time:	15	10	<del>.</del>
Column of Water in Well (i):       7.6       Depth Pump Deployed AI (ii):       1 Tubing Used (ii):       90         Purge Information       Well Diamster (iii)       1 344"       0.13       TOC-FOM (ii):       3.146         Gations/loot of Well Casing:       0.13       1 344"       0.13       TOC-FOM (ii):       3.146         Column of Water in Well (gal):       2       0.17       Est. Flow Rate (gal/min):       0.5       Development Tot. Vol (gal):       2         Vol. of Water in Well (gal):       =       0.188       4"       0.66       Purge Method:       Sub-pump of construction on the	Depth to Wate	er from TOC (ft):	13.4			WL Instrument &	s/N: steel to	ye m	casure	-
Purge Information       Well Diameter (h) Volume (galift)       TOM-GS (h):       TOC-FOM (h): $3.44$ Galionsfloot of Well Casing:       0.13 $134^{\circ}$ 0.13       Purge Mathod:       sub pump W1 controller         Column of Water in Well (h):       X       7.6       2°       0.17       Est. Flow Rate (galifni):       0.5       Development Tot Vol (gal):       2         Vol. of Water in Well (gal):       =       0.988       4°       0.66       Purge Mathod:       Sub pump W1 controller         Field Parameters       Purge Stat Time:       JS 08       Purge End time:       JS 25       Total Volume Removed (gal):       10         Time       Temperature       Dissolved 0;       Conductivity       pt1       Isol 10       ORP       Visual Clarift       Vol (gal):       15         1513 $\dot{1}$ , $\dot{1}$ $0.13$ 3635 $6$ , $64$ -21.5       Clar.       N       2       Isol 6       0.00       355.8 $6$ , $666$ -31, $0$ 11       N       X       2         1525       5.0       0.007       355.8 $6$ , $668$ -36.9       N       N       15       25 $70$ 0.027       357.9 $6$ , $668$ -31.9       11 </td <td>Column of Wa</td> <td>ter in Well (ft):</td> <td>7.6</td> <td></td> <td></td> <td>Depth Pump Depl</td> <td>oyed At (ft): <u>~19</u></td> <td>Tubing Us</td> <td>sed (ft):</td> <td>0</td>	Column of Wa	ter in Well (ft):	7.6			Depth Pump Depl	oyed At (ft): <u>~19</u>	Tubing Us	sed (ft):	0
Gaitons/foot of Well Casing: $0.13$ $(134"$ $0.13)$ Column of Water in Well (m): $x$ 7.6 $2"$ $0.17$ Column of Water in Well (m): $x$ 7.6 $2"$ $0.17$ Est. Flow Rate (gal/min): $0.5$ Development Tot. Vol (gal): $2$ Purge Water Disposal: Continue rise (1 onsite until 1) Field Parameters Purge Start Time: $1508$ Purge End time: $1525$ Total Volume Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductivity PH $0RP$ Visual Clarity Odor Sheen Removed (gal): $10$ Time Temperature Disolved 0, Conductive Disolved 0, Co	Purge Info	rmation		Well Diameter (in)	Volume (gal/ft)	TOM-GS (ft):	-	TOC-TON	(ft): <u>3.1</u>	46
Column of Water in Well (ft): $\underline{X}$ 7.6 $2^{\circ}$ 0.17 Vol. of Water in Well (ft): $\underline{x}$ 7.6 $2^{\circ}$ 0.17 Vol. of Water in Well (ft): $\underline{x}$ 7.6 $2^{\circ}$ 0.17 Vol. of Water in Well (ft): $\underline{x}$ 7.6 $2^{\circ}$ 0.17 $\underline{x}$ 0.66 Purge Water Disposal: Container: 2xcl 0 inside until 1 Field Parameters Purge Start Time: $\underline{1508}$ Purge End time: $\underline{1525}$ Total Volume Removed (gal): $\underline{10}$ Time Temperature Dissolved 0 Conductivity PH 0RP Visual Clarity Odor Sheen Removed (24-hr) 1035 °C1 [± 1096 mg/L] ± 358 µScm [± 0.1 pH units] ± 110 mV] (visual Clarity Odor Sheen Removed (24-hr) 1035 °C1 [± 1096 mg/L] ± 358 µScm [± 0.1 pH units] ± 110 mV] (visual Clarity Odor Sheen Removed (24-hr) 1510 5.0 0.09 360.4 6.64 -27.5 'C N N 2 1510 5.0 0.07 352 8 6.668 -36.9 C N N 2 1522 5.0 0.07 4 352 8 6.688 -36.9 C N N 10 1522 5.0 0.07 4 352 8 6.688 -36.9 C N N 10 1522 5.0 0.07 4 352 8 6.688 -36.9 C N N 10 1522 5.0 0.07 4 352 9 C 6.68 -37.9 C N N 10 1522 5.0 0.07 4 352 9 C 6.68 -37.9 C N N 10 1522 5.0 0.07 4 352 9 C 6.68 -37.9 C N N 10 1522 5.5 N 0 0.07 4 352 9 C 6.68 -37.9 C N N 10 1522 5.5 N 0 0.07 4 352 9 C 6.68 -37.9 C N N 10 1522 5.5 N 0 0.07 4 352 9 C 7 852 0	Gallons/foot of	Well Casing:	0.13	1 3/4 "	0.13	Purge Method:	sub pump	WI	ontro	ler
Vol. of Water in Well (gal): = 0.988 4" 0.66 Purge Water Disposal: <u>Containerized</u> <u>onsite</u> until Field Parameters Purge Start Time: <u>15.08</u> Purge End time: <u>15.25</u> Total Volume Removed (gal): <u>10</u> Time Temperature Dissolved 0, <u>Conductivity</u> <u>pH</u> <u>ORP</u> <u>Visual Clarity</u> <u>Odor</u> Sheen Removed (24-hp) (±300.5°C1 (±10% mpl.) (±3% µS/cm) (±0.1 pH inits] (±10 mV) (observed) (Y/N) (Y/N) Vol (gal) <u>15.13</u> <u>19.9</u> <u>0.13</u> <u>36.35</u> <u>0.61</u> <u>-21.5</u> <u>clas</u> <u>N</u> <u>N</u> <u>2</u> <u>16.16</u> <u>5.0</u> <u>0.068</u> <u>35.85</u> <u>6.64</u> <u>-22.3</u> <u>10</u> <u>N</u> <u>N</u> <u>355</u> <u>15.15</u> <u>5.0</u> <u>0.068</u> <u>35.85</u> <u>6.668</u> <u>-31.0</u> <u>11</u> <u>N</u> <u>N</u> <u>5.55</u> <u>15.25</u> <u>5.0</u> <u>0.077</u> <u>356.3</u> <u>6.688</u> <u>-36.9</u> <u>11</u> <u>N</u> <u>N</u> <u>7.55</u> <u>15.25</u> <u>5.10</u> <u>0.077</u> <u>356.45</u> <u>6.688</u> <u>-31.0</u> <u>11</u> <u>N</u> <u>N</u> <u>7.55</u> <u>15.25</u> <u>5.10</u> <u>0.077</u> <u>356.45</u> <u>6.688</u> <u>-32.9</u> <u>11</u> <u>N</u> <u>N</u> <u>105.265</u> <u>5.10</u> <u>0.077</u> <u>356.10</u> <u>6.688</u> <u>-32.9</u> <u>11</u> <u>N</u> <u>N</u> <u>105.255</u> <u>5.10</u> <u>0.077</u> <u>356.10</u> <u>6.688</u> <u>-32.9</u> <u>11</u> <u>N</u> <u>N</u> <u>105.255</u> <u>5.10</u> <u>0.077</u> <u>356.10</u> <u>6.688</u> <u>-32.9</u> <u>11</u> <u>N</u> <u>N</u> <u>105.255</u> <u>5.10</u> <u>0.077</u> <u>356.10</u> <u>6.688</u> <u>-32.9</u> <u>11</u> <u>N</u> <u>N</u> <u>N</u> <u>105.255</u> <u>5.10</u> <u>0.077</u> <u>356.10</u> <u>6.688</u> <u>-32.9</u> <u>11</u> <u>N</u> <u>N</u> <u>N</u> <u>105</u> <u>15.255</u> <u>5.10</u> <u>0.077</u> <u>356.10</u> <u>6.688</u> <u>-32.9</u> <u>11</u> <u>N</u> <u>N</u> <u>N</u> <u>105</u> <u>15.255</u> <u>5.10</u> <u>0.077</u> <u>356.10</u> <u>6.688</u> <u>-32.9</u> <u>11</u> <u>N</u> <u>N</u> <u>N</u> <u>105</u> <u>15.255</u> <u>5.10</u> <u>0.077</u> <u>356.10</u> <u>175.101</u> <u>436</u> <u>Purge Notes</u> : <u>3.474.10</u> <u>165</u> <u>clas</u> <u>5.265</u> <u>5.10</u> <u>0.077</u> <u>356.175.101</u> <u>436</u> <u>Purge Notes</u> : <u>3.474.10</u> <u>11</u> <u>N</u> <u>N</u> <u>105</u> <u>5.265</u> <u>5.175.101</u> <u>436</u> <u>Purge Notes</u> : <u>3.474.10</u> <u>105</u> <u>15.265</u> <u>5.261616146</u> (circle one): <u>Stapter Parameters</u> <u>or</u> <u>&gt; 33.0000</u> Vol.2 Purged <u>5.26161616</u> (circle one): <u>Stapter Parameters</u> <u>or</u> <u>&gt; 33.00000</u> <u>15.056</u> <u>175.101</u> <u>436</u> <u>Purge</u> <u>15.265</u> <u>5.2764</u> <u>5.355</u> <u>Vol1 Condition Notes</u> : <u>Casing Notes</u> <u>DRO/RRO (AK102/103); <u>0</u> GRO/BTEX (AK101 / EPA 8021B]; <u>0</u> PAH (EPA 8270D SIM); <u>0</u> VOC EPA 8280; <u>0</u> <u>PFC</u> <u>5.274</u> <u>5.355</u> <u>Vol1 Condition Notes</u>: <u>Casing Notes</u> <u>DRO/RRO (AK102/103); <u>0</u> GRO/BTEX (AK101 / EPA 8021B]; <u>0</u> PAH (<u>EPA 8270D SIM); <u>0</u> VOC EPA 8280; <u>0</u> <u>PFC</u> <u>5.274</u> <u>5</u></u></u></u>	Column of Wa	ter in Well (ft):	x 7.6	2 "	0.17	Est. Flow Rate	(gal/min): 0.5 Deve	lopment Tot.	Vol (gal): 🧾	2
Field Parameters         Purge Start Time:         15 08         Purge End time:         15 25         Total Volume Removed (gal):         10           Time         Temperature         Dissolved Q2         Conductivity         pH         ORP         Visual Clarity         Odor         Sheen         Removed           (24-h2)         (±0.5%)         (±0.9%)         (±0.1%)         (±0.1%)         (±0.1%)         (±0.1%)         (visual Clarity         Odor         Sheen         Removed           (24-h2)         (±0.5%)         (±0.9%)         (±0.1%)         (±0.1%)         (visual Clarity         Odor         Sheen         Removed           (15.16)         5.0         0.009         360.4         -21.5         clar         N         2           (15.12)         5.0         0.007         356.8         6.68         -36.9         vi         N         7.5           (15.25)         5.0         0.007         357.3         6.68         -36.9         vi         N         7.5           (15.25)         5.0         0.07         357.4         6.68         -31.9         vi         N         10           15.26         Sample A         4.00         0.00         7.5         15	Vol. of Water i	n Well (gal):	= 0.998	4"	0,66	Purge Water Disp	osal: Container	ized	onsite	until
Time         Temperature         Dissolved Op         Conductivity         pH         ORP         Visual Clarity         Odor         Sheen         Removed           (24-h)         (±05°C)         (±10° mgl.)         (±3% µS/m)         (±0.1 pH units)         (±10 mV)         (observed)         (Y/N)	Field Paramet	ters	Purge Start Tim	e: 1508	Purge End time	1525	Total Volume Removed (	gal):	0	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Time	Temperature	Dissolved O <sub>2</sub>	Conductivity	рН	ORP	Visual Clarity	Odor	Sheen	Removed
$\frac{1}{1216} 5.0 0.09 360.4 664 -27.5 (N N 35) 350 0.01 0.00 360.4 664 -27.5 (N N 35) 350 0.00 3550 6.68 -30.9 (N N 35) 350 0.00 3550 6.68 -36.9 (N N 25) 1522 5.0 0.07 3550 6.68 -30.9 (N N 25) 15250 5.0 0.07 3550 6.00 (N N 25) 17510 1936 7.00 (N N 25) 100 $	(24-11)		D.13	21.35		-215	(observed)	(Y/N)	(Y/N)	Vol (gal)
$\frac{1519}{5.0}  5.0  0.06  358.8  6.669  -31.6  11 \qquad N  N  5$ $\frac{1522}{5.0}  0.07  356.3  6.68  -36.9  1 \qquad N  N  7.5$ $\frac{1525}{5.0}  0.07  356.3  6.68  -32.9  1 \qquad N  N  7.5$ $\frac{1526}{1526}  5.0  0.07  354.0  6.68  -32.9  1 \qquad N  N  10$ $\frac{1526}{1526}  5.0  0.07  354.0  6.68  -32.9  1 \qquad N  N  10$ $\frac{1526}{1526}  5.0  0.07  354.0  6.68  -32.9  1 \qquad N  N  10$ $\frac{1526}{1526}  5.0  0.07  354.0  6.68  -32.9  1 \qquad N  N  10$ $\frac{1526}{1526}  5.0  0.07  354.0  6.68  -32.9  1 \qquad N  N  10$ $\frac{1526}{1526}  5.0  0.07  354.0  6.68  -32.9  1 \qquad N  N  10$ $\frac{1526}{1526}  5.0  0.07  354.0  6.68  -32.9  1 \qquad N  N  10$ $\frac{1526}{1526}  5.0  0.07  354.0  6.68  -32.9  1 \qquad N  N  N  10$ $\frac{1526}{1526}  5.0  0.07  1  0.07  1  0  0.07  1  0  0.07  1  0  0.07  0  0.07  0  0.07  0  0.07  0  0.07  0  0  0.07  0  0.07  0  0.07  0  0.07  0  0  0.07  0  0  0.07  0  0  0  0  0  0  0  0  0 $	1515	1.1	DAG	210.4	0.61	1713	Clear	N	N	25
$\frac{15}{15} \frac{15}{22} \frac{15}{5} \frac{10}{0} \frac{10}{0} \frac{1}{7} \frac{15}{356} \frac{10}{6} \frac{10}{668} \frac{1}{-36} \frac{11}{9} \frac{1}{10} \frac{1}$	1016	5.0	0.09	TTP G	6.64	-27.5 7	51	N	N	50
$\frac{1525}{10} = \frac{100}{3540} = \frac{100}{3540} = \frac{100}{6.68} = \frac{100}{35.29} = \frac{100}{100} = \frac{100}{10$	1577	00	0.07	300,0	6,00	-31,0	16	N	N	25
IS226       Sample find       IS226       Sample find       IS226       Sample find       IS226       IS	1025	5.0	0.07	254 0	6.68	-29 9	4	IV N	N	10
Nater Quality Meter & S/N:       YST Pro DSS       17E10193C       Purge Notes:       SI. tarticle       to clear         Nater Quality Meter & S/N:       YST Pro DSS       17E10193C       Purge Notes:       SI. tarticle       to clear         Sample Information       Sample Criteria (circle one):       Status parameters       or       > 3 Well Vol. Purged         Sample Information       Sample Criteria (circle one):       Status parameters       or       > 3 Well Vol. Purged         Sample Date:       2/13/19       Sample Dite:       MA-2       Time:       152C         Sample Nethod:       Subscript Method:       Subscript Method:       Subscript Method:       N/A       Time:         aboratory Analyses:       D BO/RRO (AK102/103);       G GRO/BTEX (AK101 / EPA 8021B);       D PAH (EPA 8270D SIM);       N VOC EPA 8260;       PFC EPA 53         Vell Condition Notes:       Casing Notes:       Quad       Juit       PVC       Casing         Monument Notes:       No       motion method       Juit       Processed       Juit       PVC         Monuments:       DTW       Monuments       A start       How measure       No       Monuments	526	C()	1. 1.	22 110	0.03	247		N	n.	10
Mater Quality Meter & S/N:       YST ProDSS       17E101936       Purge Notes:       51. And if the clear         Sample Information       Sample Criteria (circle one):       State parameters       or       > 3 Well Vol. Purged         Sample Date:       2/13/19       Sample ID:       Mw-2       Time:       1526         Sample Method:       Sub pump w/ control w       Field Dup ID:       N/A       Time:       -         Sample Method:       Sub pump w/ control w       Equip Blank ID:       N/A       Time:       -         Sample Method:       Sub pump w/ control w       Equip Blank ID:       N/A       Time:       -         Sample Method:       Sub pump w/ control w       Equip Blank ID:       N/A       Time:       -         Casing Notes:       DRO/RRO (AK102/103); a GRO/BTEX (AK101 / EPA 8021B); a PAH (EPA 8270D SIM); a VOC EPA 8260; a PFC EPA 53       Vell Condition Notes:         Casing Notes:       gaud       Monument Notes:       -       -       -         Idees & Comments:       DTW       monument - Just exposed       13/4"       casing	13 60	Sam	ue tim				- clear	~~	10	
Vater Quality Meter & S/N:       YSE Pro DSS       17E 101 93 C       Purge Notes:       1. torticl to clear         Sample Information       Sample Criteria (circle one):       Stable parameters or > 3 Well Vol. Purged         iample Date:       2/13/19       Sample ID:       MW-2       Time:       1526         iample role:       Swith , WLW       Field Dup ID:       N/A       Time:       1526         iample Method:       Sub pump w/ control       Equip Blank ID:       N/A       Time:       1526         aboratory Analyses:       DRO/RRO (AK102/103);       GRO/BTEX (AK101 / EPA 8021B);       PAH (EPA 8270D SIM);       VOC EPA 8260;       PFC EPA 53         fell Condition Notes:       Casing Notes:       Gaved       13/4"       PVC         Monument Notes:       No methormut - Just exposed       13/4"       PVC         otes & Comments:       DTW       meansured       weight a steel       base measure					/					
Vater Quality Meter & S/N: YST ProDSS 17E101936       Purge Notes: Sl. tarticle to clear         Sample Information       Sample Criteria (circle one): Stable parameters or > 3 Well Vol. Purged         sample Date:       2/13/19         sample r(s):       Smt, with         sample Method:       Smt, with         cashe       DRO/RRO (AK102/103); a GRO/BTEX (AK101 / EPA 8021B); a PAH (EPA 8270D SIM); a VOC EPA 8260; of PFC SPA 53         Vell Condition Notes:       Casing Notes:         Casing Notes:       Source         Monument Notes:       No mode number - Just exposed 13/4" PVC         Monuments:       DTW         Stable parameters:       DTW										
Vater Quality Meter & S/N:       YST Pro DSS       17E 101 93 C       Purge Notes:       Statute Parameters       or       > 3 Well Vol. Purged         Sample Information       Sample Criteria (circle one):       Stable Parameters       or       > 3 Well Vol. Purged         Sample Date:       A/13/19       Sample Dite:       MW-2       Time:       152.6         Sample Method:       Sump // control       Field Dup ID:       N/A       Time:         Sample Method:       Sump // control       Equip Blank ID:       N/A       Time:         aboratory Analyses:       DRO/RRO (AK102/103);       GRO/BTEX (AK101 / EPA 8021B);       PAH (EPA 8270D SIM);       VOC EPA 8260;       PFC EPA 53         Vell Condition Notes:       Casing Notes:       Grad       Just exposed       13/4"       Casing.         otes & Comments:       DTW       Monument Notes:       Does manufer of the single a stade base measure.       Manufer of the single a stade base measure.									(	D
Vater Quality Meter & S/N: YSL Ym USS 141210193C       Purge Notes: State parameters or > 3 Well Vol. Purged         Sample Information       Sample Criteria (circle one): State parameters or > 3 Well Vol. Purged         Sample Date:       Alising       or > 3 Well Vol. Purged         Sample Date:       Alising       or > 3 Well Vol. Purged         Sample Date:       Alising       or > 3 Well Vol. Purged         Sample Date:       Alising       or > 3 Well Vol. Purged         Sample Criteria (circle one):       State parameters or > 3 Well Vol. Purged         Sample Date:       MW-2       Time: 1526         N/A       Time:       Sample Dip         isample Method:       Support Constant         Sample Method:       Support Constant         Support Constant       Field Dup ID:       N/A       Time:       Site of PFC EPA 53         Vell Condition Notes:         Casing Notes:       Ord         Monument Notes:       No monophysic parameters of the p			15 2 DC	. AFIN	151		1 1 1 1	1		
Sample Date: <u>2/13/19</u> Sample Date: <u>2/13/19</u> Sample Date: <u>2/13/19</u> Sample Method: <u>Swh , www</u> Sample Method:	Sample Info	ormation	21 Pro US	5 172101	756	Purge Notes:	rcle one): Stable param	eters or	> 3 Well \	/ol Purged
Sampler(s): <u>Sunt</u> , <u>WLW</u> Sample Method: <u>Sub</u> <u>pump</u> <u>Wl</u> <u>controlice</u> aboratory Analyses: <u>DRO/RRO (AK102/103); <u>D</u> GRO/BTEX (AK101 / EPA 8021B); <u>D</u> PAH (EPA 8270D SIM); <u>D</u> VOC EPA 8260; <u>WPFC</u> <u>EPA</u> 53 Vell Condition Notes: <u>Casing Notes:</u> <u>Casing Notes:</u> <u>good</u> Monument Notes: <u>No</u> <u>mechanisminat</u> - just exposed 13/4" <u>Casing</u> lotes &amp; Comments: <u>DTW</u> <u>mas</u> <u>mechanisminat</u> a stud type <u>mecanic</u>.</u>	Sample Date:	2/13/1	3			Sample ID:	MW-2		Time: 14	-7(-
Sample Method: <u>Sub pump v/ conho</u> liv Equip Blank ID: <u>N/A</u> Time: <u>aboratory Analyses: DRO/RRO (AK102/103); D GRO/BTEX (AK101 / EPA 8021B); D PAH (EPA 8270D SIM); D VOC EPA 8260; <u>PFC EPA 53</u> <u>Vell Condition Notes:</u> <u>Casing Notes:</u> <u>Casing Notes:</u> <u>goved</u> <u>Monument Notes:</u> <u>No methodoment - just exposed 13/4</u>" <u>PVC</u> <u>casing Sime</u>. <u>Iotes &amp; Comments:</u> <u>DTW may pursuad begins a steel type measure</u>.</u>	Sampler(s):	SWH , N	IN			Field Dup ID:	NIA		Time:	
Laboratory Analyses: DRO/RRO (AK102/103); D GRO/BTEX (AK101 / EPA 8021B); D PAH (EPA 8270D SIM); D VOC EPA 8260; PFC EPA 53 Vell Condition Notes: Casing Notes: Casing Notes: <u>goved</u> Monument Notes: <u>No monoment - just exposed</u> 13/4" <u>PVC</u> Notes & Comments: DTW was preserved wegins a steel type measure.	Sample Metho	d: Sub a	ump w/	controller		Equip Blank ID:	NIA		Time:	-
Laboratory Analyses: DRO/RRO (AK102/103); DGRO/BTEX (AK101 / EPA 8021B); DPAH (EPA 8270D SIM); DVOC EPA 8260; PFC EPA 53 Nell Condition Notes: Casing Notes: govel Monument Notes: No mountment - just exposed 13/4" PVC Monuments: DTW was measured using a steel type measure.		1				Equip Dialik ID.	- A A		Time.	
Vell Condition Notes: <u>Casing Notes:</u> <u>govel</u> <u>Monument Notes:</u> <u>No motor unment - just exposed 13/4" casing</u> . <u>Iotes &amp; Comments:</u> <u>DTW was measured using a steel type measure</u> .	aboratory Anal	lyses: 🛛 DRO/R	RO (AK102/103)	; 🗆 GRO/BTEX (Al	<101 / EPA 8021	B); 🗆 PAH (EPA 82	270D SIM); 🛛 VOC EPA 8	260;	PFC &	PA 53
Casing Notes: govel Monument Notes: No mountment - just exposed 13/4" PVC lotes & Comments: DTW was measured begins a steel type measure.	Vell Condition	Notes:								
Monument Notes: No mountment - just exposed 13/4" casing.	Casing Notes	s: gove	R							
lotes & Comments: DTW was measured begins a steel twice measure.	Monument N	otes: No	moun	ment - }	ust ex	poseel 1	3/4" PVC			
	lotes & Comm	nents: DTW	was w	unsured be	sing a	steel to	messure			



Project:	Nasa	SW P	Fe -ons	ite	Site Location	Napa Va	n the	m, Fb	x, ith
Project #:	17-100	51			Well Number:	mn-3			
Water Colu	mn	Pre-Purge	Post-Purge: (on	ly need to be coll	ected if field staff h	ave sufficient belief these r	measurement	s have chan	ged)
Total Depth of	Well (ft):	~17	1		Water Level Meas	urement Date:	211	3/19	
Depth to Produ	ict from TOC (ft)				Water Level Meas	urement Time:	123	5	
Depth to Water	r from TOC (ft):	11.3			WL Instrument & S	s/N: steel tay	e men	sure	
Column of Wat	er in Well (ft):	5.7	$\rightarrow$		Depth Pump Depl	oyed At (ft): _~ 5	Tubing Use	ed (ft):	25
Purge Infor	mation		Well Diameter (in)	Volume (gal/ft)	TOM-GS (ft):	flush	тос-том	(ft):	64
Gallons/foot of	Well Casing:	0.17	1 3/4 "	0.13	Purge Method:	Subpump 1	al con	miles	Ċ
Column of Wat	er in Well (ft):	x 5.7	2"	0.17	Est. Flow Rate	(gal/min): Devel	opment Tot.	Vol (gal):	1,5
Vol. of Water in	n Well (gal):	= 0.969	4"	0.66	Purge Water Disp	osal: Hold onsite	- in dr	um fe	is result
Field Paramet	ers	Purge Start Tim	e: 1248	Purge End time:	1303	Total Volume Removed (	gal):	7	
Time	Temperature	Dissolved O <sub>2</sub>	Conductivity	рН	ORP	Visual Clarity	Odor	Sheen	Removed
(24-hr)	[±0.5 °C]	[± 10% mg/L]	[±3% µS/cm]	[± 0.1 pH units]	[±10 mV]	( observed )	(Y/N)	(Y/N)	Vol (gal)
1251	4.4	0.19	349.6	6.65	-46.8	clear	N	N	2
1254	4.3	0.16	349.8	6.67	-50.4	0	N	N	3,5
1257	4.5	0.11	352.7	6.68	-53.1	11	N	$\sim$	4
1300	4.7	0.10	355.2	6.68	-55.2		N	N	5
1303	4.7	6.09	354.7	6.69	-56.0	LT	N	N	6.5
1304	Sample	e fime	~			clear	N	N	2
1306	Dup 5	ample +	ime -			clear	N	N	
(								1	
								6	w)
	Astes 8 C/bl	VST Pus	Des SIN	176101936	Durge Notes:	St. traded by	dear		
Sample Info	ormation	121 10	1-22 710	17121-1100	Sample Criteria (c	ircle one): Stable paran	neters or	> 3 Well	Vol. Purged
Sample Date:	alishe				Sample ID:	mw-3		Time: 1	304
Sampler(s):	SWH h	ILW			Field Dup ID:	mm-33		Time:	306
Sample Methodi Sinh Sures und ca haller					Equip Blank ID:	5B-1		Time:	40
oumpic moure	- P				-4-1-1-				
Laboratory Ana	lyses: DRO/F	RRO (AK102/103	); 🛛 GRO/BTEX (A	K101 / EPA 8021	B); 🗆 PAH (EPA 8	270D SIM); D VOC EPA	8260; P	FC EP	A 537
Well Condition	n Notes:								
Casing Note	s: good								
Monument N	lotes: gove								
Notes & Comr	nents: DT	w mers	ned usi	ns steel	taxe m	Lasure			
				)	1				



Project:	717-10	01			Site Location	Naga-Van H	orn f	rd, F	bx, Al
Project #:	1 Naga	GN	sampling	PFC	Well Number:	mw-y			
Water Colu	mn	Pre-Purge	Post-Purge: (onl	ly need to be coll	ected if field staff h	ave sufficient belief these m	easurement	s have chan	ged)
Total Depth of	Well (ft):	-17	1		Water Level Meas	urement Date:	2/1	3/19	
Depth to Produ	ct from TOC (ft):				Water Level Meas	urement Time:	112	0	-
Depth to Water	from TOC (ft):	11.20			WL Instrument & S	S/N: Steel top	e me	isur	
Column of Wat	er in Well (ft):	~ \$ 5.80			Depth Pump Depl	oyed At (ft): ~ 15	Tubing Use	ed (ft):2	25
Purge Infor	mation		Well Diameter (in)	Volume (gal/ft)	TOM-GS (ft):	flush	тос-том	(ft):	50
Gallons/foot of	Well Casing:	0.17	1 3/4 "	0.13	Purge Method:	sub. pump n	1 con	holler	-
Column of Wat	er in Well (ft):	x 5.80	2"	0.17	Est. Flow Rate	(gal/min): ~0.5 Develo	pment Tot. '	Vol (gal):	~2
Vol. of Water in	n Well (gal):	-0.986	4"	0.66	Purge Water Disp	osal: hold for to	esting	onsite	e.
Field Paramete	ers	Purge Start Tim	e: 1141	Purge End time	1156	Total Volume Removed (g	al):	9	
Time	Temperature	Dissolved O <sub>2</sub>	Conductivity	pН	ORP	Visual Clarity	Odor	Sheen	Removed
(24-hr)	[ ±0.5 °C ]	[± 10% mg/L]	[±3% µS/cm]	[± 0.1 pH units]	[ ±10 mV ]	(observed)	(Y/N)	(Y/N)	Vol (gal)
1144	3.4	0,49	319.1	6.69	-41.0	clear/situs	N	~	3
1147	3.5	0.37	318.9	6.66	-42.4	15	N	2	~4.5
1150	3.4	0.28	318-2	6.63	-43.3	ii.	N	N	6.
1153	3.5	0.25	318.9	6.62	-43.1		N	N	7.5
1156	3.5	0.20	329.7	6.62	- 43.4	n	N	n	9
11 57	Samp	le tim	1			clear	N	N	-
1									
				_					
							/	4	
Mater Quelity N	Anton & C/Alt	SE P.D	SS ITEL	01936	Purge Notes:	1. turbiel to	ded	-	
Sample Info	ormation	-1.00			Sample Criteria (c	ircle one): Stable parame	eters or	3 Well	Vol. Purged)
Sample Date:	2/13/	19			Sample ID:	mn - 4		Time: 1	157
Sampler(s):	SIVH	NLW			Field Dup ID:	MIA		Time:	-
Sample Metho	d: sub a	man w	controlla	-	Equip Blank ID:	NIA	1.1.1	Time:	-
oumpie metre								1	: PI4
Laboratory Ana	lyses: 🛛 DRO/F	RRO (AK102/103	); 🛛 GRO/BTEX (A	K101 / EPA 8021	B); D PAH (EPA 8	3270D SIM);    VOC EPA 8	260;	PFC	537
Well Condition	n Notes:								
Casing Note	s: good								
Monument N	lotes: au	d							
Notes & Com	nents: DTw	messur	ed using	steel +	are meas	ure			
			3						

### Appendix 4



### 2018/2019 On-Site Groundwater Monitoring Report 1937 Van Horn Road, Fairbanks, Alaska May 2019



**Photo 1:** October 9, 2018. Looking north along the west side ditch during sampling of MW3 adjacent to the vapor extraction system (VES) housing and stack. MW1 and MW2 (white stickup) are located (red arrows) in the ditch at the property boundary.



**Photo 2:** February 13, 2019. Looking northwest at the NAPA Auto Parts Store. MW4 is located adjacent to the east side VES housing stack shown rising to above the roof line. This well is situated at the corner of the rebuilt NAPA store before an addition was added in 2013.



### 2018/2019 On-Site Groundwater Monitoring Report 1937 Van Horn Road, Fairbanks, Alaska May 2019



**Photo 3:** February 13, 2019. Looking south along the west side boundary ditch at MW2 (white stickup) and MW1. MW2 followed by MW1 had higher sums of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) concentrations than MW3 or MW4.



**Photo 4:** February 13, 2019. Looking north during sampling of MW4 located adjacent to the east side VES housing.

### Appendix 5



#### Laboratory Report of Analysis

To: Nortech 2450 College Road Fairbanks, AK 99709 (907)452-5688

Report Number: 1189850

Client Project: 2018 GW Napa Van Horn

Dear Scott Hummel,

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 Jennifer 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.

Stephen Ede 2018.11.07 Alaska Division Technical Director 11:34:00 -09'00'

Jennifer Dawkins Project Manager Jennifer.Dawkins@sgs.com Date

Print Date: 11/07/2018 9:29:26AM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com Results via Engage

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#### **Case Narrative**

SGS Client: Nortech SGS Project: 1189850 Project Name/Site: 2018 GW Napa Van Horn Project Contact: Scott Hummel

Refer to sample receipt form for information on sample condition.

#### HR-1 (1189850001) PS

PFCs by 537M 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: 11/07/2018 9:29:26AM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com

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#### Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <<u>http://www.sgs.com/en/Terms-and-Conditions.aspx></u>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
В	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.
Sample summaries which in	oclude a result for "Total Solids" have already been adjusted for moisture content

Print Date: 11/07/2018 9:29:28AM

Note:

All DRO/RRO analyses are integrated per SOP.



Sample Summary										
Client Sample ID	Lab Sample ID	Collected	Received	Matrix						
HR-1	1189850001	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						
MW-2	1189850002	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						
MW-1R	1189850003	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						
MW-3	1189850004	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						
EB-Napa VH	1189850005	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						
MW-4	1189850006	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						
MW-44	1189850007	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						
TB-Napa VH	1189850008	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						
Field Blank	1189850009	10/09/2018	10/10/2018	Water (Surface, Eff., Ground)						

Method AK102 SW8260C-SIM SW8260C Method Description DRO Low Volume (W)

SW8260-SIM (W)

Volatile Organic Compounds (W) FULL



### **Detectable Results Summary**

Client Sample ID: **EB-Napa VH** Lab Sample ID: 1189850005 **Volatile GC/MS** 

Parameter Toluene <u>Result</u> 3.02 <u>Units</u>

ug/L

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200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com

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Results of MW-2							
Client Sample ID: <b>MW-2</b> Client Project ID: <b>2018 GW Napa Var</b> Lab Sample ID: 1189850002 Lab Project ID: 1189850	C R M S L						
						Allowable	
<u>Parameter</u> 1,2,3-Trichloropropane 1,2-Dibromoethane	<u>Result Qual</u> 0.0100 U 0.00500 U	<u>LOQ/CL</u> 0.0100 0.00500	<u>DL</u> 0.00250 0.00125	<u>Units</u> ug/L ug/L	<u>DF</u> 1 1	Limits	Date Analyzed 10/21/18 09:50 10/21/18 09:50
Surrogates							
4-Bromofluorobenzene (surr)	99.4	85-114		%	1		10/21/18 09:50
Toluene-d8 (surr)	98.9	89-112		%	1		10/21/18 09:50
Analytical Batch: VMS18479 Analytical Method: SW8260C-SIM Analyst: NRB Analytical Date/Time: 10/21/18 09:50 Container ID: 1189850002-C			Prep Batch: \ Prep Method: Prep Date/Tim Prep Initial Wt Prep Extract \	/XX33396 SW5030E ne: 10/21/ ./Vol.: 25 /ol: 25 mL	3 18 00:30 mL		

- Results of <b>MW-1R</b>							
Client Sample ID: <b>MW-1R</b> Client Project ID: <b>2018 GW Napa Var</b> Lab Sample ID: 1189850003 Lab Project ID: 1189850	C R M S La	ollection Dat eceived Date atrix: Water olids (%): ocation:	und)				
Results by Volatile-SIM							
Parameter 1,2,3-Trichloropropane 1,2-Dibromoethane	<u>Result Qual</u> 0.0100 U 0.00500 U	<u>LOQ/CL</u> 0.0100 0.00500	<u>DL</u> 0.00250 0.00125	<u>Units</u> ug/L ug/L	<u>DF</u> 1 1	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u> 10/21/18 10:06 10/21/18 10:06
Surrogates							
4-Bromofluorobenzene (surr)	98.3	85-114		%	1		10/21/18 10:06
Toluene-d8 (surr)	99.6	89-112		%	1		10/21/18 10:06
Batch Information							
Analytical Batch: VMS18479 Analytical Method: SW8260C-SIM Analyst: NRB Analytical Date/Time: 10/21/18 10:06 Container ID: 1189850003-C		F F F	rep Batch: VXX33396 rep Method: SW5030B rep Date/Time: 10/21/18 00:30 rep Initial Wt./Vol.: 25 mL rep Extract Vol: 25 mL				

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SGS							
Client Sample ID: <b>MW-3</b> Client Project ID: <b>2018 GW Napa Van</b> Lab Sample ID: 1189850004 Lab Project ID: 1189850	Collection Date: 10/09/18 13:41 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground)						
		L	ocation:				
Results by Semivolatile Organic Fuels	5						
<u>Parameter</u> Diesel Range Organics	<u>Result Qual</u> 0.566 U	<u>LOQ/CL</u> 0.566	<u>DL</u> 0.170	<u>Units</u> mg/L	<u>DF</u> 1	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u> 10/15/18 13:57
Surrogates							
5a Androstane (surr)	88.1	50-150		%	1		10/15/18 13:57
Batch Information							
Analytical Batch: XFC14708 Analytical Method: AK102 Analyst: CMS Analytical Date/Time: 10/15/18 13:57 Container ID: 1189850004-I			Prep Batch: Prep Method Prep Date/Ti Prep Initial V Prep Extract	Prep Batch: XXX40721 Prep Method: SW3520C Prep Date/Time: 10/13/18 08:13 Prep Initial Wt./Vol.: 265 mL Prep Extract Vol: 1 mL			

Results of MW-3

Client Sample ID: MW-3
Client Project ID: 2018 GW Napa Van Horn
Lab Sample ID: 1189850004
Lab Project ID: 1189850

Collection Date: 10/09/18 13:41 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						Allowable	
Parameter	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		10/12/18 16:42
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:42
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		10/12/18 16:42
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,2-Dichloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:42
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:42
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:42
Benzene	0.400 U	0.400	0.120	ug/L	1		10/12/18 16:42
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
Bromoform	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Bromomethane	5.00 U	5.00	1.50	ug/L	1		10/12/18 16:42
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:42
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
Chloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42

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Results of MW-3

Client Sample ID: MW-3
Client Project ID: 2018 GW Napa Van Horr
Lab Sample ID: 1189850004
Lab Project ID: 1189850

Collection Date: 10/09/18 13:41 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						<u>Allowable</u>	
<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
Chloroform	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Chloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:42
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Dichlorodifluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Freon-113	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:42
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Isopropylbenzene (Cumene)	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Methylene chloride	5.00 U	5.00	1.00	ug/L	1		10/12/18 16:42
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:42
Naphthalene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/12/18 16:42
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Styrene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Toluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Trichlorofluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:42
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:42
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		10/12/18 16:42
Xylenes (total)	3.00 U	3.00	1.00	ug/L	1		10/12/18 16:42
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		10/12/18 16:42
4-Bromofluorobenzene (surr)	102	85-114		%	1		10/12/18 16:42
Toluene-d8 (surr)	103	89-112		%	1		10/12/18 16:42
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SGS North America Inc.



Results of MW-3

Client Sample ID: **MW-3** Client Project ID: **2018 GW Napa Van Horn** Lab Sample ID: 1189850004 Lab Project ID: 1189850 Collection Date: 10/09/18 13:41 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

### **Batch Information**

Analytical Batch: VMS18444 Analytical Method: SW8260C Analyst: FDR Analytical Date/Time: 10/12/18 16:42 Container ID: 1189850004-C Prep Batch: VXX33339 Prep Method: SW5030B Prep Date/Time: 10/12/18 00:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL

Results of <b>MW-3</b>							
Client Sample ID: <b>MW-3</b> Client Project ID: <b>2018 GW Napa Var</b> Lab Sample ID: 1189850004 Lab Project ID: 1189850	C R M S	ollection Dat eceived Date atrix: Water olids (%): ocation:	e: 10/09/ e: 10/10/ <sup>.</sup> (Surface,	18 13:41 18 16:59 Eff., Gro	und)		
Results by Volatile-SIM			_				
<u>Parameter</u> 1,2,3-Trichloropropane 1,2-Dibromoethane	<u>Result Qual</u> 0.0100 U 0.00500 U	<u>LOQ/CL</u> 0.0100 0.00500	<u>DL</u> 0.00250 0.00125	<u>Units</u> ug/L ug/L	<u>DF</u> 1 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 10/21/18 10:21 10/21/18 10:21
Surrogates				-			
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/21/18 10:21
Toluene-d8 (surr)	99.4	89-112		%	1		10/21/18 10:21
Batch Information							
Analytical Batch: VMS18479 Analytical Method: SW8260C-SIM Analyst: NRB Analytical Date/Time: 10/21/18 10:21 Container ID: 1189850004-F		i i i i i i i i i i i i i i i i i i i	Prep Batch: N Prep Method: Prep Date/Tim Prep Initial Wt Prep Extract N	/XX33396 SW5030E ne: 10/21/ ./Vol.: 25 nL /ol: 25 mL	3 18 00:30 mL		

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Results of EB-Napa VH							
Client Sample ID: <b>EB-Napa VH</b> Client Project ID: <b>2018 GW Napa Van</b> Lab Sample ID: 1189850005 Lab Project ID: 1189850		Collection Da Received Da Matrix: Wate Solids (%): Location:	ate: 10/09/ te: 10/10/ <sup>,</sup> r (Surface,	18 14:04 18 16:59 Eff., Gro	und)		
Results by Semivolatile Organic Fuels	6		_				
<u>Parameter</u> Diesel Range Organics	<u>Result Qual</u> 0.556 U	<u>LOQ/CL</u> 0.556	<u>DL</u> 0.167	<u>Units</u> mg/L	<u>DF</u> 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 10/15/18 14:07
Surrogates							
5a Androstane (surr)	99.4	50-150		%	1		10/15/18 14:07
Batch Information Analytical Batch: XFC14708 Analytical Method: AK102 Analyst: CMS Analytical Date/Time: 10/15/18 14:07 Container ID: 1189850005-I			Prep Batch: Prep Method Prep Date/Ti Prep Initial W Prep Extract	XXX40721 : SW3520C me: 10/13/1 /t./Vol.: 270 Vol: 1 mL	; 18 08:13 1 mL		

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Results of EB-Napa VH

Client Sample ID: **EB-Napa VH** Client Project ID: **2018 GW Napa Van Horn** Lab Sample ID: 1189850005 Lab Project ID: 1189850 Collection Date: 10/09/18 14:04 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						<u>Allowable</u>	
Parameter	<u>Result Qual</u>	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		10/12/18 16:59
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:59
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		10/12/18 16:59
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,2-Dichloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:59
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:59
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:59
Benzene	0.400 U	0.400	0.120	ug/L	1		10/12/18 16:59
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
Bromoform	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Bromomethane	5.00 U	5.00	1.50	ug/L	1		10/12/18 16:59
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:59
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
Chloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59

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Results of EB-Napa VH

#### Client Sample ID: **EB-Napa VH** Client Project ID: **2018 GW Napa Van Horn** Lab Sample ID: 1189850005 Lab Project ID: 1189850

Collection Date: 10/09/18 14:04 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						<u>Allowable</u>	
<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
Chloroform	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Chloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 16:59
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Dichlorodifluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Freon-113	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:59
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Isopropylbenzene (Cumene)	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Methylene chloride	5.00 U	5.00	1.00	ug/L	1		10/12/18 16:59
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:59
Naphthalene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/12/18 16:59
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Styrene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Toluene	3.02	1.00	0.310	ug/L	1		10/12/18 16:59
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Trichlorofluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 16:59
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		10/12/18 16:59
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		10/12/18 16:59
Xylenes (total)	3.00 U	3.00	1.00	ug/L	1		10/12/18 16:59
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		10/12/18 16:59
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/12/18 16:59
Toluene-d8 (surr)	101	89-112		%	1		10/12/18 16:59

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Results of EB-Napa VH

#### Client Sample ID: **EB-Napa VH** Client Project ID: **2018 GW Napa Van Horn** Lab Sample ID: 1189850005 Lab Project ID: 1189850

Collection Date: 10/09/18 14:04 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

#### **Batch Information**

Analytical Batch: VMS18444 Analytical Method: SW8260C Analyst: FDR Analytical Date/Time: 10/12/18 16:59 Container ID: 1189850005-C Prep Batch: VXX33339 Prep Method: SW5030B Prep Date/Time: 10/12/18 00:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL

SGS							
Client Sample ID: EB-Nana VH		C	ollection Dat	e. 10/09/	18 14.04		
Client Project ID: 2018 GW Napa Va	n Horn	R	eceived Date	e: 10/10/	18 16:59		
Lab Sample ID: 1189850005		M	atrix: Water	(Surface,	Eff., Gro	und)	
Lab Project ID: 1189850	S	olids (%):					
Results by Volatile-SIM							
						Allowable	
Parameter	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Limits	Date Analyzed
1,2,3-Trichloropropane	0.0100 U	0.0100	0.00250	ug/L	1		10/21/18 10:37
1,2-Dibromoethane	0.00500 U	0.00500	0.00125	ug/L	1		10/21/18 10:37
Surrogates							
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/21/18 10:37
Toluene-d8 (surr)	99.9	89-112		%	1		10/21/18 10:37
Batch Information Analytical Batch: VMS18479 Analytical Mathed: SW8260C SIM		F	Prep Batch: N	/XX33396	}		
Analyst: NRB Analytical Date/Time: 10/21/18 10:37 Container ID: 1189850005-F		F	Prep Date/Tim Prep Initial Wt Prep Extract V	ne: 10/21/1 ./Vol.: 25 r /ol: 25 mL	, 18 00:30 mL		

SGS Popula of MW.4							
Client Sample ID: MW-4		C	Collection Da	ate: 10/09/	/18 15:15		
Client Project ID: 2018 GW Napa Van	Horn	F	Received Da	ite: 10/10/	18 16:59		
Lab Sample ID: 1189850006		Ν	/latrix: Wate	r (Surface,	Eff., Gro	und)	
Lab Project ID: 1189850		S	Solids (%):				
		L	ocation:				
Results by Semivolatile Organic Fuels	6		_				
Parameter	<u>Result Qual</u>	LOQ/CL	DL	<u>Units</u>	<u>DF</u>	<u>Allowable</u> <u>Limits</u>	Date Analyzed
Diesel Range Organics	0.588 U	0.588	0.176	mg/L	1		10/15/18 14:18
Surrogates							
5a Androstane (surr)	95.6	50-150		%	1		10/15/18 14:18
Batch Information							
Analytical Batch: XFC14708			Prep Batch:	XXX40721			
Analytical Method: AK102			Prep Method	I: SW35200			
Analytical Date/Time: 10/15/18 14:18			Prep Initial V	vt /Vol · 255	5 ml		
Container ID: 1189850006-I			Prep Extract	Vol: 1 mL			

Results of MW-4

Client Sample ID: MW-4
Client Project ID: 2018 GW Napa Van Horr
Lab Sample ID: 1189850006
Lab Project ID: 1189850

Collection Date: 10/09/18 15:15 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						<u>Allowable</u>	
Parameter	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		10/12/18 17:16
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:16
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		10/12/18 17:16
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,2-Dichloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:16
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:16
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:16
Benzene	0.400 U	0.400	0.120	ug/L	1		10/12/18 17:16
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
Bromoform	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Bromomethane	5.00 U	5.00	1.50	ug/L	1		10/12/18 17:16
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:16
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
Chloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16

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Results of MW-4

Client Sample ID: MW-4
Client Project ID: 2018 GW Napa Van Horr
Lab Sample ID: 1189850006
Lab Project ID: 1189850

Collection Date: 10/09/18 15:15 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						<u>Allowable</u>	
<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
Chloroform	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Chloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:16
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Dichlorodifluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Freon-113	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:16
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Isopropylbenzene (Cumene)	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Methylene chloride	5.00 U	5.00	1.00	ug/L	1		10/12/18 17:16
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:16
Naphthalene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/12/18 17:16
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Styrene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Toluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Trichlorofluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:16
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:16
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		10/12/18 17:16
Xylenes (total)	3.00 U	3.00	1.00	ug/L	1		10/12/18 17:16
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		10/12/18 17:16
4-Bromofluorobenzene (surr)	100	85-114		%	1		10/12/18 17:16
Toluene-d8 (surr)	102	89-112		%	1		10/12/18 17:16
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Results of MW-4

Client Sample ID: **MW-4** Client Project ID: **2018 GW Napa Van Horn** Lab Sample ID: 1189850006 Lab Project ID: 1189850 Collection Date: 10/09/18 15:15 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

### **Batch Information**

Analytical Batch: VMS18444 Analytical Method: SW8260C Analyst: FDR Analytical Date/Time: 10/12/18 17:16 Container ID: 1189850006-C Prep Batch: VXX33339 Prep Method: SW5030B Prep Date/Time: 10/12/18 00:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL

Results of <b>MW-4</b>								
Client Sample ID: <b>MW-4</b> Client Project ID: <b>2018 GW Napa Var</b> Lab Sample ID: 1189850006 Lab Project ID: 1189850	n Horn	Collection Date: 10/09/18 15:15 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:						
Results by Volatile-SIM								
Parameter 1,2,3-Trichloropropane	<u>Result Qual</u> 0.0100 U	<u>LOQ/CL</u> 0.0100	<u>DL</u> 0.00250	<u>Units</u> ug/L	<u>DF</u> 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 10/21/18 10:53	
Surrogatoc	0.00000 0	0.00000	0.00125	ug/L	I		10/21/10 10:00	
4-Bromofluorobenzene (surr)	102	85-114		%	1		10/21/18 10:53	
Toluene-d8 (surr)	99.7	89-112		%	1		10/21/18 10:53	
Batch Information								
Analytical Batch: VMS18479 Analytical Method: SW8260C-SIM Analyst: NRB Analytical Date/Time: 10/21/18 10:53 Container ID: 1189850006-F		F F F	Prep Batch: N Prep Method: Prep Date/Tim Prep Initial Wt Prep Extract N	ep Batch: VXX33396 ep Method: SW5030B ep Date/Time: 10/21/18 00:30 ep Initial Wt./Vol.: 25 mL ep Extract Vol: 25 mL				

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Results of <b>MW-44</b> Client Sample ID: <b>MW-44</b> Client Project ID: <b>2018 GW Napa Van Horn</b> Lab Sample ID: 1189850007 Lab Project ID: 1189850								
		C R M S L						
results by Sennvolatile Organic Puels	•					Allowable		
<u>Parameter</u> Diesel Range Organics	<u>Result Qual</u> 0.600 U	<u>LOQ/CL</u> 0.600	<u>DL</u> 0.180	<u>Units</u> mg/L	<u>DF</u> 1	<u>Limits</u>	Date Analyzed 10/15/18 14:29	
Surrogates								
5a Androstane (surr)	85.2	50-150		%	1		10/15/18 14:2	
Batch Information								
Analytical Batch: XFC14708 Analytical Method: AK102 Analyst: CMS			Prep Batch: XXX40721 Prep Method: SW3520C Prep Date/Time: 10/13/18 08:13 Prep Initial Wt./Vol.: 250 mL					

Results of MW-44

Client Sample ID: MW-44
Client Project ID: 2018 GW Napa Van Horr
Lab Sample ID: 1189850007
Lab Project ID: 1189850

Collection Date: 10/09/18 15:25 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						<u>Allowable</u>	
<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		10/12/18 17:33
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:33
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		10/12/18 17:33
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,2-Dichloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:33
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:33
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:33
Benzene	0.400 U	0.400	0.120	ug/L	1		10/12/18 17:33
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
Bromoform	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Bromomethane	5.00 U	5.00	1.50	ug/L	1		10/12/18 17:33
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:33
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
Chloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33

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Results of MW-44

Client Sample ID: MW-44
Client Project ID: 2018 GW Napa Van Horr
Lab Sample ID: 1189850007
Lab Project ID: 1189850

Collection Date: 10/09/18 15:25 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						<u>Allowable</u>	
<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
Chloroform	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Chloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 17:33
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Dichlorodifluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Freon-113	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:33
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Isopropylbenzene (Cumene)	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Methylene chloride	5.00 U	5.00	1.00	ug/L	1		10/12/18 17:33
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:33
Naphthalene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/12/18 17:33
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Styrene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Toluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Trichlorofluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 17:33
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		10/12/18 17:33
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		10/12/18 17:33
Xylenes (total)	3.00 U	3.00	1.00	ug/L	1		10/12/18 17:33
Surrogates							
1.2-Dichloroethane-D4 (surr)	101	81-118		%	1		10/12/18 17:33
4-Bromofluorobenzene (surr)	102	85-114		%	1		10/12/18 17:33
Toluene-d8 (surr)	103	89-112		%	1		10/12/18 17:33
	.00	00 112		/0	•		10,12,10,11.00

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Results of MW-44

#### Client Sample ID: **MW-44** Client Project ID: **2018 GW Napa Van Horn** Lab Sample ID: 1189850007 Lab Project ID: 1189850

Collection Date: 10/09/18 15:25 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

#### **Batch Information**

Analytical Batch: VMS18444 Analytical Method: SW8260C Analyst: FDR Analytical Date/Time: 10/12/18 17:33 Container ID: 1189850007-C Prep Batch: VXX33339 Prep Method: SW5030B Prep Date/Time: 10/12/18 00:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL

Results of <b>MW-44</b> Client Sample ID: <b>MW-44</b> Client Project ID: <b>2018 GW Napa Van Horn</b> Lab Sample ID: 1189850007 Lab Project ID: 1189850							
		Collection Date: 10/09/18 15:25 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:					
Results by Volatile-SIM			_				
<u>Parameter</u> 1,2,3-Trichloropropane 1,2-Dibromoethane	<u>Result Qual</u> 0.0100 U 0.00500 U	<u>LOQ/CL</u> 0.0100 0.00500	<u>DL</u> 0.00250 0.00125	<u>Units</u> ug/L ug/L	<u>DF</u> 1 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 10/21/18 11:08 10/21/18 11:08
Surrogates							
4-Bromofluorobenzene (surr)	102	85-114		%	1		10/21/18 11:08
Toluene-d8 (surr)	99.6	89-112		%	1		10/21/18 11:08
Batch Information							
Analytical Batch: VMS18479 Analytical Method: SW8260C-SIM Analyst: NRB Analytical Date/Time: 10/21/18 11:08 Container ID: 1189850007-F		Prep Batch: VXX33396 Prep Method: SW5030B Prep Date/Time: 10/21/18 00:30 Prep Initial Wt./Vol.: 25 mL Prep Extract Vol: 25 mL					
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Results of TB-Napa VH

Client Sample ID: **TB-Napa VH** Client Project ID: **2018 GW Napa Van Horn** Lab Sample ID: 1189850008 Lab Project ID: 1189850 Collection Date: 10/09/18 09:40 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						Allowable	
Parameter	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
1,1,1,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
1,1,1-Trichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,1,2,2-Tetrachloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
1,1,2-Trichloroethane	0.400 U	0.400	0.120	ug/L	1		10/12/18 15:33
1,1-Dichloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,1-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,1-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,2,3-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,2,3-Trichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,2,4-Trichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,2,4-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,2-Dibromo-3-chloropropane	10.0 U	10.0	3.10	ug/L	1		10/12/18 15:33
1,2-Dibromoethane	0.0750 U	0.0750	0.0180	ug/L	1		10/12/18 15:33
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,2-Dichloroethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
1,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,3,5-Trimethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
1,3-Dichloropropane	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
2,2-Dichloropropane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
2-Butanone (MEK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 15:33
2-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
2-Hexanone	10.0 U	10.0	3.10	ug/L	1		10/12/18 15:33
4-Chlorotoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
4-Isopropyltoluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
4-Methyl-2-pentanone (MIBK)	10.0 U	10.0	3.10	ug/L	1		10/12/18 15:33
Benzene	0.400 U	0.400	0.120	ug/L	1		10/12/18 15:33
Bromobenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Bromochloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Bromodichloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
Bromoform	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Bromomethane	5.00 U	5.00	1.50	ug/L	1		10/12/18 15:33
Carbon disulfide	10.0 U	10.0	3.10	ug/L	1		10/12/18 15:33
Carbon tetrachloride	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
Chloroethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33

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Results of TB-Napa VH

Client Sample ID: TB-Napa VH
Client Project ID: 2018 GW Napa Van Horn
Lab Sample ID: 1189850008
Lab Project ID: 1189850

Collection Date: 10/09/18 09:40 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

						<u>Allowable</u>	
<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Limits</u>	Date Analyzed
Chloroform	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Chloromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
cis-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
cis-1,3-Dichloropropene	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
Dibromochloromethane	0.500 U	0.500	0.150	ug/L	1		10/12/18 15:33
Dibromomethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Dichlorodifluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Freon-113	10.0 U	10.0	3.10	ug/L	1		10/12/18 15:33
Hexachlorobutadiene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Isopropylbenzene (Cumene)	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Methylene chloride	5.00 U	5.00	1.00	ug/L	1		10/12/18 15:33
Methyl-t-butyl ether	10.0 U	10.0	3.10	ug/L	1		10/12/18 15:33
Naphthalene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
n-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
n-Propylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
o-Xylene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		10/12/18 15:33
sec-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Styrene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
tert-Butylbenzene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Tetrachloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Toluene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
trans-1,2-Dichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
trans-1,3-Dichloropropene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Trichloroethene	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Trichlorofluoromethane	1.00 U	1.00	0.310	ug/L	1		10/12/18 15:33
Vinyl acetate	10.0 U	10.0	3.10	ug/L	1		10/12/18 15:33
Vinyl chloride	0.150 U	0.150	0.0500	ug/L	1		10/12/18 15:33
Xylenes (total)	3.00 U	3.00	1.00	ug/L	1		10/12/18 15:33
Surrogates				-			
1.2-Dichloroethane-D4 (surr)	105	81-118		%	1		10/12/18 15 <sup>.</sup> 33
4-Bromofluorobenzene (surr)	103	85-114		%	1		10/12/18 15:33
Toluene-d8 (surr)	101	89-112		%	1		10/12/18 15:33
		00 112		/0	•		10,12,10,10.00

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Results of TB-Napa VH

Client Sample ID: **TB-Napa VH** Client Project ID: **2018 GW Napa Van Horn** Lab Sample ID: 1189850008 Lab Project ID: 1189850 Collection Date: 10/09/18 09:40 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:

### Results by Volatile GC/MS

### **Batch Information**

Analytical Batch: VMS18444 Analytical Method: SW8260C Analyst: FDR Analytical Date/Time: 10/12/18 15:33 Container ID: 1189850008-A Prep Batch: VXX33339 Prep Method: SW5030B Prep Date/Time: 10/12/18 00:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL

Print Date: 11/07/2018 9:29:31AM

SGS Results of TB-Nana VH							
Client Sample ID: <b>TB-Napa VH</b> Client Project ID: <b>2018 GW Napa Va</b> Lab Sample ID: 1189850008 Lab Project ID: 1189850	Collection Date: 10/09/18 09:40 Received Date: 10/10/18 16:59 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:						
Parameter 1,2,3-Trichloropropane 1,2-Dibromoethane	<u>Result Qual</u> 0.0100 U 0.00500 U	<u>LOQ/CL</u> 0.0100 0.00500	<u>DL</u> 0.00250 0.00125	<u>Units</u> ug/L ug/L	<u>DF</u> 1 1	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u> 10/21/18 08:32 10/21/18 08:32
Surrogates 4-Bromofluorobenzene (surr) Toluene-d8 (surr)	102 100	85-114 89-112		% %	1 1		10/21/18 08:32 10/21/18 08:32
Batch Information Analytical Batch: VMS18479 Analytical Method: SW8260C-SIM Analyst: NRB Analytical Date/Time: 10/21/18 08:32 Container ID: 1189850008-D			Prep Batch: V Prep Method: Prep Date/Tim Prep Initial Wt Prep Extract V	/XX33396 SW5030E ne: 10/21/ ./Vol.: 25 n /ol: 25 mL	3 18 00:30 mL		

Print Date: 11/07/2018 9:29:31AM

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### Method Blank

Blank ID: MB for HBN 1787716 [VXX/33339] Blank Lab ID: 1482714 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1189850004, 1189850005, 1189850006, 1189850007, 1189850008

Results by SW8260C					
Parameter	Results		וח	Units	
1.1.1.2-Tetrachloroethane	0.250U	0.500	0.150	ua/L	
1.1.1-Trichloroethane	0.500U	1.00	0.310	ua/L	
1.1.2.2-Tetrachloroethane	0.250U	0.500	0.150	ua/L	
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L	
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L	
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L	
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L	
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L	
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L	
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L	
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L	
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L	
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L	
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L	
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L	
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L	
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L	
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L	
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L	
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L	
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L	
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L	
2-Chlorotoluene	0.500U	1.00	0.310	ug/L	
2-Hexanone	5.00U	10.0	3.10	ug/L	
4-Chlorotoluene	0.500U	1.00	0.310	ug/L	
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L	
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L	
Benzene	0.200U	0.400	0.120	ug/L	
Bromobenzene	0.500U	1.00	0.310	ug/L	
Bromochloromethane	0.500U	1.00	0.310	ug/L	
Bromodichloromethane	0.250U	0.500	0.150	ug/L	
Bromoform	0.500U	1.00	0.310	ug/L	
Bromomethane	2.50U	5.00	1.50	ug/L	
Carbon disulfide	5.00U	10.0	3.10	ug/L	
Carbon tetrachloride	0.500U	1.00	0.310	ug/L	
Chlorobenzene	0.250U	0.500	0.150	ug/L	
Chloroethane	0.500U	1.00	0.310	ug/L	
Chloroform	0.500U	1.00	0.310	ug/L	

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### Method Blank

Blank ID: MB for HBN 1787716 [VXX/33339] Blank Lab ID: 1482714 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1189850004, 1189850005, 1189850006, 1189850007, 1189850008

Results by SW8260C				
	<b>D H</b>		5.	
Parameter	<u>Results</u>	LOQ/CL	<u>DL</u>	<u>Units</u>
Chloromethane	0.5000	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1.2-Dichloroethane-D4 (surr)	102	81-118		%
4-Bromofluorobenzene (surr)	100	85-114		%
Toluene-d8 (surr)	101	89-112		%
		=		

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Method Blank							
Blank ID: MB for HBN 17 Blank Lab ID: 1482714	787716 [VXX/33339]	Matrix: Water (Surface, Eff., Ground)					
QC for Samples: 1189850004, 1189850005,	1189850006, 1189850007, 118	9850008					
Results by SW8260C							
Parameter	Results	LOQ/CL	DL	<u>Units</u>			
atch Information							
Analytical Batch: VMS1 Analytical Method: SW8 Instrument: VPA 780/59	8444 3260C 275 GC/MS	Prep Ba Prep M Prep D	atch: VXX333 ethod: SW503 ate/Time: 10/1	39 30B 2/2018 12:00:00AM			
Analyst: FDR Analytical Date/Time: 1	0/12/2018 1:48:00PM	Prep In Prep Ex	tial Wt./Vol.: 8 tract Vol: 5 m	5 mL L			

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Blank Spike ID: LCS for HBN 1189850 [VXX33339] Blank Spike Lab ID: 1482715 Date Analyzed: 10/12/2018 14:05 Spike Duplicate ID: LCSD for HBN 1189850 [VXX33339] Spike Duplicate Lab ID: 1482716 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189850004, 1189850005, 1189850006, 1189850007, 1189850008

#### Results by SW8260C Blank Spike (ug/L) Spike Duplicate (ug/L) Parameter Spike Rec (%) Spike Rec (%) CL RPD (%) RPD CL Result Result 30 30.9 103 30 30.0 100 1,1,1,2-Tetrachloroethane (78-124) 3.00 (< 20) 96 28.5 1,1,1-Trichloroethane 30 28.7 30 95 (74-131) 0.56 (< 20) 1,1,2,2-Tetrachloroethane 30 31.6 105 30 30.3 101 (71 - 121)4.40 (< 20) 1,1,2-Trichloroethane 30 30.7 102 30 29.8 99 (80-119) 3.10 (< 20) 94 27.9 1.1-Dichloroethane 30 28.3 30 93 (77-125) 1.20 (< 20) 1,1-Dichloroethene 30 29.0 97 30 28.8 96 (71-131) 0.66 (< 20) 1,1-Dichloropropene 30 29.2 97 30 28.8 96 (79-125) 1.40 (< 20) 30 104 30 28.9 (69-129) 7.20 1,2,3-Trichlorobenzene 31.1 96 (< 20) (73-122) 1,2,3-Trichloropropane 30 31.2 104 30 30.2 101 3.30 (< 20) 107 30 29.9 6.70 1,2,4-Trichlorobenzene 30 32.0 100 (69-130) (< 20) 1,2,4-Trimethylbenzene 30 32.5 108 30 31.1 104 4.50 (79-124) (< 20) 1,2-Dibromo-3-chloropropane 30 31.7 106 30 30.0 100 (62-128) 5.70 (< 20) 1,2-Dibromoethane 30 30.9 103 30 30.6 0.98 102 (77 - 121)(< 20) 1.2-Dichlorobenzene 30 30.9 103 30 30.0 100 (80-119) 3.10 (< 20) 1,2-Dichloroethane 30 28.6 95 30 28.3 94 (73-128) 1.10 (< 20) 30 98 30 28.8 1.90 1,2-Dichloropropane 29.3 96 (78-122) (< 20) 1,3,5-Trimethylbenzene 30 32.3 108 30 30.8 103 (75-124) 4.70 (< 20) 1,3-Dichlorobenzene 30 32.0 107 30 30.6 102 (80-119) 4.70 (< 20) 102 30 30.0 1,3-Dichloropropane 30 30.6 100 (80-119) 2.10 (< 20) 30 32.0 107 30 30.3 5.30 1,4-Dichlorobenzene 101 (79-118) (< 20) 2,2-Dichloropropane 30 28.0 93 30 28.3 94 (60-139) 1.10 (< 20) 2-Butanone (MEK) 90 90.2 100 90 88.3 98 2.10 (56-143) (< 20) 2-Chlorotoluene 30 32.0 107 30 30.4 101 (79-122) 5.00 (< 20) 2-Hexanone 90 96.8 108 90 94 0 104 (57-139) 2.90 (< 20) 105 30 30.7 3.00 4-Chlorotoluene 30 31.6 102 (78-122) (< 20) 4-Isopropyltoluene 30 32.6 109 30 31.3 104 (77-127) 4.30 (< 20) 4-Methyl-2-pentanone (MIBK) 90 93.2 104 90 91.6 102 (67-130) 1.80 (< 20) Benzene 30 28.7 96 30 28.4 95 (79-120) 1.30 (< 20) 30 106 Bromobenzene 31.7 30 30.1 100 (80-120) 5.40 (< 20) Bromochloromethane 30 28.5 95 30 28.3 94 (78-123) 0.56 (< 20) Bromodichloromethane 30 29.5 98 30 29.3 98 (79-125) 0.82 (< 20) Bromoform 30 32.6 109 30 32.3 0.92 108 (66-130) (< 20) Bromomethane 30 26.4 88 30 26.6 89 (53-141)0.91 (< 20) 45 Carbon disulfide 98 97 1.30 44.1 45 43.6 (64-133) (< 20)

Print Date: 11/07/2018 9:29:34AM

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Blank Spike ID: LCS for HBN 1189850 [VXX33339] Blank Spike Lab ID: 1482715 Date Analyzed: 10/12/2018 14:05 Spike Duplicate ID: LCSD for HBN 1189850 [VXX33339] Spike Duplicate Lab ID: 1482716 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189850004, 1189850005, 1189850006, 1189850007, 1189850008

#### Results by SW8260C Blank Spike (ug/L) Spike Duplicate (ug/L) Parameter Spike Rec (%) Spike Rec (%) <u>CL</u> RPD (%) RPD CL Result Result Carbon tetrachloride 30 29.9 100 30 29.8 100 (72-136) 0.33 (< 20) 30 98 28.3 Chlorobenzene 29.3 30 94 (82-118) 3.30 (< 20) Chloroethane 30 31.0 103 30 30.9 103 (60-138) 0.26 (< 20) Chloroform 30 27.5 92 30 27.3 91 (79-124) 0.88 (< 20) 98 33.0 Chloromethane 30 29.330 110 (50-139) 11.90 (< 20) cis-1,2-Dichloroethene 30 28.4 95 30 28.3 94 (78-123) 0.46 (< 20) cis-1,3-Dichloropropene 30 29.9 100 30 30.2 101 (75-124) 0.93 (< 20) Dibromochloromethane 30 31.4 105 30 31.0 103 (74-126) 1.40 (< 20) Dibromomethane 30 28.6 95 30 28.7 96 (79-123) 0.21 (< 20) Dichlorodifluoromethane 30 30.8 103 30 30.9 0.29 103 (32-152) (< 20) Ethylbenzene 30 30.5 102 30 29.6 99 2.70 (79-121)(< 20) Freon-113 45 45.5 101 45 45.1 100 (70-136) 1.00 (< 20) Hexachlorobutadiene 30 30.7 102 30 29.8 99 3.00 (66-134) (< 20) Isopropylbenzene (Cumene) 30 31.4 105 30 30.3 101 3.50 (72-131) (< 20) Methylene chloride 30 29.1 97 30 29.1 97 (74-124) 0.14 (< 20) Methyl-t-butyl ether 45 42.9 95 45 42.9 (71-124) 0.12 95 (< 20) Naphthalene 30 32.7 109 30 30.7 102 (61-128) 6.30 (< 20) n-Butylbenzene 30 32.8 109 30 31.3 104 (75-128) 5.00 (< 20) 30 32.4 108 30 31.0 4.40 n-Propylbenzene 103 (76-126) (< 20) 30 30.6 102 30 29.9 100 2.30 o-Xylene (78-122) (< 20) P & M -Xylene 60 61.8 103 60 59.5 99 (80-121) 3.70 (< 20) sec-Butylbenzene 30 32.8 109 30 31.0 103 (77-126) 5.70 (< 20) 104 Styrene 30 31.2 30 30.7 102 (78-123) 1.50 (< 20) 108 30 5.90 tert-Butylbenzene 30 32.5 30.6 102 (78-124) (< 20) Tetrachloroethene 30.7 102 30 29.6 99 (74-129) 3.90 30 (< 20) 96 30 Toluene 30 28.8 27.7 92 (80-121) 3.80 (< 20) trans-1,2-Dichloroethene 30 28.3 95 30 28.0 93 (75-124) 1.20 (< 20) trans-1,3-Dichloropropene 30 31.8 106 30 31.5 105 (73-127) 1.10 (< 20) Trichloroethene 30 28.9 96 30 28.4 1.70 95 (79-123) (< 20) Trichlorofluoromethane 30 29.1 97 30 28.9 96 (65-141) 0.72 (< 20) Vinyl acetate 30 29.4 98 30 29.6 99 (54-146) 0.75 (< 20) Vinyl chloride 30 30.0 100 30 30.0 100 (58-137) 0.07 (< 20) (79-121) Xylenes (total) 90 92.4 103 90 89.5 99 3.20 (< 20)

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Blank Spike ID: LCS for HBN 1189850 [VXX33339] Blank Spike Lab ID: 1482715 Date Analyzed: 10/12/2018 14:05 Spike Duplicate ID: LCSD for HBN 1189850 [VXX33339] Spike Duplicate Lab ID: 1482716 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189850004, 1189850005, 1189850006, 1189850007, 1189850008

### Results by SW8260C

		Blank Spil	ke (%)		Spike Dup	licate (%)			
<u>Parameter</u>	<u>Spike</u>	Result	<u>Rec (%)</u>	<u>Spike</u>	Result	<u>Rec (%)</u>	<u>CL</u>	<u>RPD (%)</u>	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	94.9	95	30	95.9	96	(81-118)	1.00	
4-Bromofluorobenzene (surr)	30	104	104	30	101	101	(85-114)	2.70	
Toluene-d8 (surr)	30	103	103	30	101	101	(89-112)	1.60	

### **Batch Information**

Analytical Batch: VMS18444 Analytical Method: SW8260C Instrument: VPA 780/5975 GC/MS Analyst: FDR Prep Batch: VXX33339 Prep Method: SW5030B Prep Date/Time: 10/12/2018 00:00 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 11/07/2018 9:29:34AM



### Method Blank

Blank ID: MB for HBN 1788127 [VXX/33396] Blank Lab ID: 1484510

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1189850002, 1189850003, 1189850004, 1189850005, 1189850006, 1189850007, 1189850008

Results by SW8260C-SIM				
Parameter_	Results	LOQ/CL	<u>DL</u>	<u>Units</u>
1,2,3-Trichloropropane	0.00500U	0.0100	0.00250	ug/L
1,2-Dibromoethane	0.00250U	0.00500	0.00125	ug/L
Surrogates				
4-Bromofluorobenzene (surr)	102	85-114		%
Toluene-d8 (surr)	99.5	89-112		%
Batch Information				

Analytical Batch: VMS18479 Analytical Method: SW8260C-SIM Instrument: VRA Agilent GC/MS 7890B/5977A Analyst: NRB Analytical Date/Time: 10/21/2018 6:43:00AM

4

Prep Batch: VXX33396 Prep Method: SW5030B Prep Date/Time: 10/21/2018 12:30:00AM Prep Initial Wt./Vol.: 25 mL Prep Extract Vol: 25 mL

Print Date: 11/07/2018 9:29:36AM



Blank Spike ID: LCS for HBN 1189850 [VXX33396] Blank Spike Lab ID: 1484511 Date Analyzed: 10/21/2018 06:59 Spike Duplicate ID: LCSD for HBN 1189850 [VXX33396] Spike Duplicate Lab ID: 1484512 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189850002, 1189850003, 1189850004, 1189850005, 1189850006, 1189850007, 1189850008

Results by SW8260C-SIM			_						
		Blank Spike	e (ug/L)	;	Spike Dupli	cate (ug/L)			
<u>Parameter</u>	<u>Spike</u>	Result	<u>Rec (%)</u>	<u>Spike</u>	Result	<u>Rec (%)</u>	<u>CL</u>	<u>RPD (%)</u>	RPD CL
1,2,3-Trichloropropane	0.2	0.202	101	0.2	0.199	99	(73-122)	1.30	(< 20)
1,2-Dibromoethane	0.2	0.200	100	0.2	0.197	99	(77-121)	1.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	30	102	102	30	98.8	99	(85-114)	2.80	(< 20)
Toluene-d8 (surr)	30	100	100	30	100	100	(89-112)	0.35	(< 20)

### **Batch Information**

Analytical Batch: VMS18479 Analytical Method: SW8260C-SIM Instrument: VRA Agilent GC/MS 7890B/5977A Analyst: NRB Prep Batch: VXX33396 Prep Method: SW5030B Prep Date/Time: 10/21/2018 00:30 Spike Init Wt./Vol.: 0.2 ug/L Extract Vol: 25 mL Dupe Init Wt./Vol.: 0.2 ug/L Extract Vol: 25 mL

Print Date: 11/07/2018 9:29:38AM

# SGS

XXX/40721]	Matrix:	: Water (Surfac	e, Eff., Ground)	
006 1180850007				
JUU, 1109030007				
Results	LOQ/CL	<u>DL</u>	<u>Units</u>	
.293J	0.600	0.180	mg/L	
3.9	60-120		%	
	Prep Bate	ch: XXX40721		
	Prep Met	hod: SW3520C		
	Prep Date	e/Time: 10/13/20	)18 8:13:06AM	
12.03.00PM	Prep Initia Prep Extr	al Wt./Vol.: 250 i ract Vol: 1 ml	nL	
	1.0p EX	Source Fine		
	<u>esults</u> 293J 3.9 12:03:00PM	LOQ/CL       .293J     0.600       3.9     60-120       Prep Bate       Prep Met       Prep Date       Prep Initia       Prep Extr	LOQ/CL         DL           .293J         0.600         0.180           3.9         60-120           Prep Batch: XXX40721           Prep Method: SW3520C           Prep Date/Time: 10/13/20           Prep Initial Wt./Vol.: 250 r           Prep Extract Vol: 1 mL	LOQ/CL       DL       Units         .293J       0.600       0.180       mg/L         3.9       60-120       %         Prep Batch: XXX40721         Prep Method:       SW3520C         Prep Initial Wt./Vol.:       250 mL         Prep Extract Vol:       1 mL

Print Date: 11/07/2018 9:29:39AM



Blank Spike ID: LCS for HBN 1189850 [XXX40721] Blank Spike Lab ID: 1482534 Date Analyzed: 10/15/2018 12:14 Spike Duplicate ID: LCSD for HBN 1189850 [XXX40721] Spike Duplicate Lab ID: 1482535 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1189850004, 1189850005, 1189850006, 1189850007

Results by AK102									
		Blank Spike	e (mg/L)	ę	Spike Duplie	cate (mg/L)			
<u>Parameter</u>	<u>Spike</u>	Result	<u>Rec (%)</u>	<u>Spike</u>	Result	<u>Rec (%)</u>	<u>CL</u>	<u>RPD (%)</u>	RPD CL
Diesel Range Organics	20	18.3	91	20	19.1	96	(75-125)	4.30	(< 20 )
Surrogates									
5a Androstane (surr)	0.4	98.2	98	0.4	109	109	(60-120)	10.20	
Batch Information									
Analytical Batch: XFC14708				Pre	o Batch: X	XX40721			
Analytical Method: AK102				Pre	o Method:	SW3520C			
Instrument: Agilent 7890B F				Pre	p Date/Tim	e: 10/13/201	8 08:13		
Analyst: CMS				Spil	ke Init Wt./\	/ol.: 20 mg/l	<ul> <li>Extract Vo</li> </ul>	l: 1 mL	
				Dup	e Init Wt./\	/ol.: 20 mg/l	Extract Vol	: 1 mL	

Print Date: 11/07/2018 9:29:40AM



SGS North America Inc. CHAIN OF CUSTODY RECORD



Locations Nationwide Alaska Maryland New Jersey New York North Carolina Indiana West Virgina Kentucky www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. CLIENT: Nortach Omissions may delay the onset of analysis. Page 1 of 1 Susan Section 3 PHONE NO: 907 452-5688 Preservative Vost CONTACT: PROJECT Juon # PROJECT 2018 GW Her itc PWSID/ HOT NAME: Napa Van Horn PERMIT#: С 7-1001 o REPORTS TO: E-MAIL: Туре n N \$ 201 Sim C = 45 VOC scott. hummel @ nortechengen s. Hummel COMP AK G = QUOTE #: INVOICE TO: In GRAB 1 Nortech 17-1001 P.O. #: 60 Multi N 260 R DRo Incre-E MATRIX/ DATE N TIME mental RESERVED **REMARKS**/ R SAMPLE IDENTIFICATION MATRIX Solls 00 mm/dd/yy HH:MM for lab use 00 s LOC ID CODE × 2 10/9/18 10:05 WATER grab -HR-1 -DA-B DA-E mw-2 5 × × 11:48 5 × -× 3 A-E mw-IR 12:48 × 5 A-J mw-3 × 10 × 1341 S) A-J × 1404 10 × × EB-Nape VH 6 A-J × 1515 × mw-4 10 × × A-J 10 × mw-44 1525 × × × Lab Prepacel × 8 A-F × TB-Napa VH 0940 -Lab Prepper 9) A-B 10/alis × Field Blank 0945 water -10/09/18 Section 4 **DOD Project? Yes No** Data Deliverable Requirements: Time **Received By:** Date Relinquished By: (1) 1625 10/9/18 1625 Cooler ID: Requested Turnaround Time and/or Special Instructions: Relinquished By: (2) Date Time **Received By:** SIMS VULS: std. no J flags. s B-4,2-60B 1,2-dibromoethine -1,2,5-TCP (trichlow proper) Section 10-10-18 1400 PFCS kept in own cooler. Relinguished By: (3) Date Time **Received By:** Chain of Custody Seal: (Circle) Temp Blank °C: 42 HO **Received For Laboratory By:** Relinguished By: (4) Date Time 0 INTACT BROKEN ABSENT or Ambient NO 11/18 1037 (See attached Sample Receipt Form) (See attached Sample Receipt Form) Looker al. ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301 ANC! 1.5 D36 ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557 http://www.sgs.com/terms-and-conditions

cooler 1: 0.6 Da3





### FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

Review Criteria:		onditio	n: 0	<b>Comments/Actions Taken</b>	
Were <b>custody seals</b> intact? Note # & location, if applicable. COC accompanied samples?	Yes	No No	N/A N/A	Exemption permitted if sampler hand carries/delivers.	
Temperature blank compliant* (i.e., 0-6°C)         If >6°C, were samples collected <8 hours ago?	Yes Yes Yes	No No No	OA OA	Exemption permitted if chilled & collected <8hrs ago	
It samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank and "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note ambient () or chilled (). Please check one.				Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.	
Delivery Method: Client (hand carried) Other:	Trac Or s	cking/A see atta Or N/A	B# : ched		
→For samples received with payment, note amount (\$ ) and who	ether cash	/ check	c/CC (ci	rcle one) was received.	
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	C	No	N/A	Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.	
Were Trin Blanks (i.e. VOAs II-Ha) in cooler with samples?	RZ	No	N/A		
For RUSH/SHORT Hold Time, were COC/Bottles flagged	Yes	No	N/A		
accordingly? Was Rush/Short HT email sent, if applicable?	Yes	No	NA.		
Additional notes (if applicable):					
Profile #: 362417					
Note to Client: any "no" circled above indicates non-compliance	with standa	rd proce	dures and n	nay impact data quality.	

e-Sample Receipt Form

SGS	
SGS	

SGS	SGS Workorder #:	1	189	850			8 9 8 5	
Rev	view Criteria	Condition (Yes,	No, N/A		Exce	eptions No	oted below	
Chain of	Custody / Temperature Requi	irements		N/A E	xemption pe	rmitted if sam	npler hand carries/deliver	s.
	Were Custody Seals intact? Note # &	location YES	1F 1B					
	COC accompanied s	amples? <b>YES</b>						
	N/A **Exemption permitted if	f chilled & colle	cted <8 h	ours age	o, or for sam	ples where c	hilling is not required	
		YES	Cooler II	D:	1	@	0.6 °C Therm. ID: D	23
- ·		YES	Cooler II	D:	2	@	1.5 °C Therm. ID: D	36
Temperatu	ure blank compliant* (i.e., 0-6 °C afte	er CF)?	Cooler II	D:		@	°C Therm. ID:	
			Cooler II	): 		@	°C Thorm ID:	
*lf >6°	C were samples collected <8 hours			J.		<u>u</u>	G menn. ib.	
	If <0°C, were sample containers ic	e free? N/A						
If samples receive	ed <u>without</u> a temperature blank, the	"cooler						
temperature" will be doc "COOLER TEMP" will be r	umented in lieu of the temperature	blank & either a						
temp blank nor coole	er temp can be obtained, note "amb	pient" or						
	"(	chilled".						
Note: Identify containe	rs received at non-compliant tempe	erature .						
, l	Jse form FS-0029 if more space is r	needed.						
Holding Time / Do	ocumentation / Sample Condition R	equirements	Note: Re	fer to fo	rm F-083 "S	ample Guide	" for specific holding time	es.
W	/ere samples received within holdin	g time? YES						
Do samples match COC	C** (i.e.,sample IDs,dates/times coll-	ected)?	Sample <sup>-</sup> times are	1 is lab e identi	elled HR-1 o cal. Loggeo	on COC and d in per COC	HW-1 on jar. Collection	I
Were analyses requested i	unier < m, record details & login pe	ified for YES						
were analyses requested t	analyses with >1 option for a	nalysis)						
					+		we stale (s. w 000 0/0000 1	
Were proper containers	c (type/mass/volume/preservativo***				Exemption	permitted for	metais (e.g,200.8/6020A	<u>v).</u>
	Volatile / LL-Hg Reg	uirements						
Were Trip Blanks (	i.e., VOAs, LL-Hg) in cooler with sa	mples? YES						
Were all water VOA vials	s free of headspace (i.e., bubbles ≤	6mm)? YES						
Were all s	soil VOAs field extracted with MeOH	I+BFB? N/A						
Note to Clier	nt: Any "No", answer above indicates no	on-compliance	with stand	lard pro	cedures and	d may impact	data quality.	
	Addition	al notes (if a	pplicabl	e).				
PFCs and Field Blank arriv	ved in Cooler 1. All other samples	and trip bla	nks arri	ved in	Cooler 2.			



### Sample Containers and Preservatives

<u>Container Id</u>	Preservative	<u>Container</u> <u>Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container</u> Condition
1189850001-4	No Preservative Required	OK	1189850007-I	HCL to $pH < 2$	OK
1189850001 A	No Preservative Required	OK	1189850007-1	HCL to $pH < 2$	OK OK
1189850002-A	No Preservative Required	OK	1189850008-A	HCL to $pH < 2$	OK
1189850002-R	No Preservative Required	OK	1189850008-B	HCL to $pH < 2$	OK
1189850002-C	HCL to $pH < 2$	OK	1189850008-C	HCL to $pH < 2$	OK
1189850002-C	HCL to $pH < 2$	OK	1189850008-D	HCL to $pH < 2$	OK
1189850002-E	HCL to $pH < 2$	OK	1189850008-F	HCL to pH $< 2$	OK
1189850003-A	No Preservative Required	OK	1189850008-F	HCL to pH $< 2$	OK
1189850003-B	No Preservative Required	OK	1189850009-A	No Preservative Required	OK
1189850003-C	HCL to pH < 2	OK	1189850009-B	No Preservative Required	OK
1189850003-D	HCL to $pH < 2$	OK	1109000009 B		ÖN
1189850003-F	HCL to $pH < 2$	OK			
1189850004-A	No Preservative Required	OK			
1189850004-B	No Preservative Required	OK			
1189850004-C	HCL to pH < 2	OK			
1189850004-D	HCL to $pH < 2$	OK			
1189850004-F	HCL to $pH < 2$	OK			
1189850004-F	HCL to $pH < 2$	OK			
1189850004-G	HCL to $pH < 2$	OK			
1189850004-H	HCL to $pH < 2$	OK			
1189850004-I	HCL to pH < 2	OK			
1189850004-J	HCL to pH < 2	OK			
1189850005-A	No Preservative Required	OK			
1189850005-B	No Preservative Required	OK			
1189850005-C	HCL to pH < 2	OK			
1189850005-D	HCL to pH < 2	OK			
1189850005-E	HCL to pH < 2	OK			
1189850005-F	HCL to pH < 2	OK			
1189850005-G	HCL to pH < 2	OK			
1189850005-H	HCL to pH < 2	ОК			
1189850005-I	HCL to $pH < 2$	ОК			
1189850005-J	HCL to pH < 2	OK			
1189850006-A	No Preservative Required	ОК			
1189850006-B	No Preservative Required	ОК			
1189850006-C	HCL to $pH < 2$	OK			
1189850006-D	HCL to pH < 2	OK			
1189850006-E	HCL to pH < 2	OK			
1189850006-F	HCL to $pH < 2$	OK			
1189850006-G	HCL to pH < 2	OK			
1189850006-H	HCL to pH < 2	OK			
1189850006-I	HCL to pH < 2	OK			
1189850006-J	HCL to $pH < 2$	ОК			
1189850007-A	No Preservative Required	ОК			
1189850007-B	No Preservative Required	ОК			
1189850007-C	HCL to $pH < 2$	ОК			
1189850007-D	HCL to $pH < 2$	ОК			
1189850007-E	HCL to $pH < 2$	ОК			
1189850007-F	HCL to $pH < 2$	ОК			
1189850007-G	HCL to $pH < 2$	ОК			
1189850007-H	HCL to pH < 2	OK		-	

Container Id

<u>Preservative</u>

Container Condition Container Id

<u>Preservative</u>

Container Condition

### 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.
- $\operatorname{IC}$  The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized
- container and therefore was not suitable for analysis.

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.



### **Orlando, FL**



**Automated Report** 

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

## **Technical Report for**

### SGS North America, Inc

1189850

SGS Job Number: FA58382



Sampling Date: 10/09/18

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: **31**



aitlinkin

Caitlin Brice, M.S. General Manager

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.

Client Service contact: Heather Wandrey 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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Please share your ideas about how we can serve you better at: EHS.US.CustomerCare@sgs.com



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# Sample Summary

SGS North America, Inc

1189850

Sample Number	Collected Date	Time By	Received	Matr Code	іх Туре	Client Sample ID
FA58382-1	10/09/18	10:05 JS	10/13/18	AQ	Water	HR-1
FA58382-2	10/09/18	11:48 JS	10/13/18	AQ	Ground Water	MW-2
FA58382-3	10/09/18	12:48 JS	10/13/18	AQ	Ground Water	MW-1R
FA58382-4	10/09/18	13:41 JS	10/13/18	AQ	Ground Water	MW-3
FA58382-5	10/09/18	14:04 JS	10/13/18	AQ	Water	EB-NAPA VH
FA58382-6	10/09/18	15:15 JS	10/13/18	AQ	Ground Water	MW-4
FA58382-7	10/09/18	15:25 JS	10/13/18	AQ	Ground Water	MW-44
FA58382-8	10/09/18	09:45 JS	10/13/18	AQ	Field Blank Water	FIELD BLANK

Job No: FA58382

### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: SGS North America, Inc

1189850

Site:

Job No: FA58382

**Report Date:** 11/6/2018 8:18:11

7 Sample(s) and 1 Field Blank(s) were collected on 10/09/2018 and were received at SGS North America Inc - Orlando on 10/13/2018 properly preserved, at 1.9 Deg. C and intact. These Samples received an SGS Orlando job number of FA58382. 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 537 MOD

Matrix: AQ Batch ID: OP72261 All samples were extracted within the recommended method holding time. All samples were analyzed within the recommended method holding time. All method blanks for this batch meet method specific criteria. Sample(s) FA58428-2MS were used as the QC samples indicated. Sample(s) FA58382-3, FA58382-4, FA58382-7, FA58382-2, FA58382-6 have surrogates outside control limits. FA58382-2 for 13C2-PFDA: Outside control limits due to dilution. FA58382-2 for 13C2-PFHxA: Outside control limits due to dilution. FA58382-2 for d5-NEtFOSAA: Outside control limits due to dilution. FA58382-2 for d5-NEtFOSAA: Outside control limits. FA58382-2: Confirmed by re-extraction and reanalysis. FA58382-2: Confirmed by re-extraction and reanalysis. FA58382-3 for 13C2-PFDA: Outside control limits due to dilution. FA58382-3 for 13C2-PFHxA: Outside control limits due to dilution. FA58382-3 for d5-NEtFOSAA: Outside control limits due to dilution. FA58382-4 for 13C2-PFDA: Outside control limits due to dilution. FA58382-4 for 13C2-PFHxA: Outside control limits due to dilution. FA58382-4 for d5-NEtFOSAA: Outside control limits due to dilution. FA58382-6 for 13C2-PFDA: Outside control limits. FA58382-6 for d5-NEtFOSAA: Outside control limits. FA58382-6 for d5-NEtFOSAA: Outside control limits. FA58382-6: Confirmed by re-extraction and reanalysis. FA58382-6: Confirmed by re-extraction and reanalysis. FA58382-7 for d5-NEtFOSAA: Outside control limits due to dilution. Batch ID: OP72428 Matrix: AO FA58382-2 for 13C2-PFDA: Outside control limits due to dilution. FA58382-2 for 13C2-PFHxA: Outside control limits due to dilution. FA58382-2 for d5-NEtFOSAA: Outside control limits due to dilution. FA58382-2: Confirmation run. FA58382-2: Confirmation run. FA58382-6: Confirmation run. FA58382-6: Confirmation run.

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:

Kim Benham, Client Services (signature on file)



# Summary of Hits

Job Number:	FA58382
Account:	SGS North America, Inc
Project:	1189850
Collected:	10/09/18

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
FA58382-1	HR-1					
Perfluorobutanoi	c acid	0.00555 J	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluoropentano	ic acid	0.00534 J	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorohexanoi	c acid	0.00895	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorooctanoio	e acid	0.00553 J	0.0080	0.0020	ug/l	EPA 537 MOD
Perfluorononanoi	c acid	0.00417 J	0.0080	0.0020	ug/l	EPA 537 MOD
Perfluorobutanes	ulfonic acid	0.0151	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluoropentane	sulfonic acid	0.0108	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorohexanes	sulfonic acid	0.0523	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorooctanes	ulfonic acid	0.0677	0.0080	0.0020	ug/l	EPA 537 MOD
FA58382-2	MW-2					
Perfluorobutanoi	c acid <sup>a</sup>	0.305	0.080	0.040	ug/l	EPA 537 MOD
Perfluoropentano	ic acid <sup>a</sup>	0.532	0.080	0.040	ug/l	EPA 537 MOD
Perfluorohexanoi	c acid <sup>a</sup>	1.89	0.080	0.040	ug/l	EPA 537 MOD
Perfluoroheptano	ic acid <sup>a</sup>	0.365	0.080	0.040	ug/l	EPA 537 MOD
Perfluorooctanoio	c acid <sup>a</sup>	1.05	0.080	0.020	ug/l	EPA 537 MOD
Perfluorononanoi	ic acid <sup>a</sup>	0.0283 J	0.080	0.020	ug/l	EPA 537 MOD
Perfluorobutanes	ulfonic acid <sup>a</sup>	3.04	0.080	0.040	ug/l	EPA 537 MOD
Perfluoropentane	sulfonic acid <sup>a</sup>	3.97	0.80	0.40	ug/l	EPA 537 MOD
Perfluorohexanes	sulfonic acid <sup>a</sup>	23.5	0.80	0.40	ug/l	EPA 537 MOD
Perfluoroheptane	sulfonic acid <sup>a</sup>	2.19	0.080	0.040	ug/l	EPA 537 MOD
Perfluorooctanes	ulfonic acid <sup>a</sup>	24.8	0.80	0.20	ug/l	EPA 537 MOD
6:2 Fluorotelome	er sulfonate <sup>a</sup>	0.531	0.20	0.080	ug/l	EPA 537 MOD
FA58382-3	MW-1R					
Perfluorobutanoi	c acid	0.0661 J	0.077	0.038	ug/l	EPA 537 MOD
Perfluoropentano	ic acid	0.153	0.077	0.038	ug/l	EPA 537 MOD
Perfluorohexanoi	c acid	0.249	0.077	0.038	ug/l	EPA 537 MOD
Perfluoroheptano	ic acid	0.0793	0.077	0.038	ug/l	EPA 537 MOD
Perfluorooctanoio	e acid	0.461	0.077	0.019	ug/l	EPA 537 MOD
Perfluorononanoi	ic acid	0.123	0.077	0.019	ug/l	EPA 537 MOD
Perfluoroundecar	noic acid	0.0465 J	0.077	0.038	ug/l	EPA 537 MOD
Perfluorobutanes	ulfonic acid	0.479	0.077	0.038	ug/l	EPA 537 MOD
Perfluoropentane	sulfonic acid	0.336	0.077	0.038	ug/l	EPA 537 MOD
Perfluorohexanes	sulfonic acid	5.59	0.77	0.38	ug/l	EPA 537 MOD
Perfluoroheptane	sulfonic acid	2.27	0.077	0.038	ug/l	EPA 537 MOD
Perfluorooctanes	ulfonic acid	23.8	0.77	0.19	ug/l	EPA 537 MOD
6:2 Fluorotelome	er sulfonate	0.355	0.19	0.077	ug/l	EPA 537 MOD

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# Summary of Hits

Job Number:	FA58382
Account:	SGS North America, Inc
Project:	1189850
Collected:	10/09/18

Lab Sample ID Client Sample ID Analyte	Result/ Qual	RL	MDL	Units	Method
FA58382-4 MW-3					
Perfluorobutanoic acid	0.522	0.15	0.077	ug/l	EPA 537 MOD
Perfluoropentanoic acid	0.537	0.15	0.077	ug/l	EPA 537 MOD
Perfluorohexanoic acid	1.54	0.15	0.077	ug/l	EPA 537 MOD
Perfluoroheptanoic acid	0.174	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorooctanoic acid	0.0635	0.0077	0.0019	ug/l	EPA 537 MOD
Perfluorononanoic acid	0.0137	0.0077	0.0019	ug/l	EPA 537 MOD
Perfluoroundecanoic acid	0.00943	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorotridecanoic acid	0.0114	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorobutanesulfonic acid	4.81	0.15	0.077	ug/l	EPA 537 MOD
Perfluoropentanesulfonic acid	3.74	0.15	0.077	ug/l	EPA 537 MOD
Perfluorohexanesulfonic acid	5.59	0.15	0.077	ug/l	EPA 537 MOD
Perfluoroheptanesulfonic acid	0.0539	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorooctanesulfonic acid	0.355	0.0077	0.0019	ug/l	EPA 537 MOD
6:2 Fluorotelomer sulfonate	0.0292	0.019	0.0077	ug/l	EPA 537 MOD
FA58382-5 EB-NAPA VH					
Perfluorooctanesulfonic acid	0.00230 J	0.0080	0.0020	ug/l	EPA 537 MOD
FA58382-6 MW-4					
Perfluorobutanoic acid <sup>a</sup>	0.0624	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluoropentanoic acid <sup>a</sup>	0.0899	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorohexanoic acid <sup>a</sup>	0.158	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluoroheptanoic acid <sup>a</sup>	0.0294	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorooctanoic acid <sup>a</sup>	0.0909	0.0080	0.0020	ug/l	EPA 537 MOD
Perfluorononanoic acid <sup>a</sup>	0.00675 J	0.0080	0.0020	ug/l	EPA 537 MOD
Perfluorobutanesulfonic acid <sup>a</sup>	0.512	0.080	0.040	ug/l	EPA 537 MOD
Perfluoropentanesulfonic acid <sup>a</sup>	0.248	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorohexanesulfonic acid <sup>a</sup>	1.14	0.080	0.040	ug/l	EPA 537 MOD
Perfluoroheptanesulfonic acid <sup>a</sup>	0.0821	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorooctanesulfonic acid <sup>a</sup>	0.431	0.080	0.020	ug/l	EPA 537 MOD
6:2 Fluorotelomer sulfonate <sup>a</sup>	0.112	0.020	0.0080	ug/l	EPA 537 MOD
FA58382-7 MW-44					
Perfluorobutanoic acid	0.0595	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluoropentanoic acid	0.100	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorohexanoic acid	0.172	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluoroheptanoic acid	0.0308	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorooctanoic acid	0.134	0.0077	0.0019	ug/l	EPA 537 MOD
Perfluorononanoic acid	0.00902	0.0077	0.0019	ug/l	EPA 537 MOD
Perfluorobutanesulfonic acid	0.648	0.077	0.038	ug/l	EPA 537 MOD

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## Summary of Hits

Job Number:	FA58382
Account:	SGS North America, Inc
Project:	1189850
Collected:	10/09/18

Lab Sample ID Client Sample ID Analyte	Result/ Qual	RL	MDL	Units	Method
Perfluoropentanesulfonic acid	0.277	$\begin{array}{c} 0.0077 \\ 0.077 \\ 0.0077 \\ 0.077 \\ 0.019 \end{array}$	0.0038	ug/l	EPA 537 MOD
Perfluorohexanesulfonic acid	2.15		0.038	ug/l	EPA 537 MOD
Perfluoroheptanesulfonic acid	0.117		0.0038	ug/l	EPA 537 MOD
Perfluorooctanesulfonic acid	0.772		0.019	ug/l	EPA 537 MOD
6:2 Fluorotelomer sulfonate	0.167		0.0077	ug/l	EPA 537 MOD
FA58382-8 FIELD BLANK					
Perfluorononanoic acid	0.00234 J	$0.0077 \\ 0.0077$	0.0019	ug/l	EPA 537 MOD
Perfluorooctanesulfonic acid	0.00440 J		0.0019	ug/l	EPA 537 MOD

(a) Confirmed by re-extraction and reanalysis.



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Orlando, FL

Section 4

4

Sample Results

Report of Analysis

				Report	of An	alysis			Page 1 of 2	
Client Sam Lab Sample Matrix: Method: Project:	ple ID: e ID:	HR-1 FA5838 AQ - Wa EPA 53 1189850	2-1 ater 7 MOD EP2	A 537 MOD	537 MOD			Sampled: Received: ent Solids:	10/09/18 10/13/18 n/a	
Run #1 Run #2	File ID Q54945	.D	<b>DF</b> 1	<b>Analyzed</b> 10/30/18 16:46	<b>By</b> NAF	<b>Prep Da</b> 10/19/13	ate 8 08:30	Prep Bate OP72261	h Analytical Batch SQ1265	
Run #1 Run #2	Initial V 250 ml	Volume	<b>Final Volu</b> 1.0 ml	me						
PFAS List										
CAS No.	Comp	ound		Result	RL	MDL	Units	Q		
PERFLUO	ROALK	YLCAR	BOXYLIC A	ACIDS						
375-22-4	Perflu	orobutanc	oic acid	0.00555	0.0080	0.0040	ug/l	J		
2706-90-3	Perflue	oropentan	oic acid	0.00534	0.0080	0.0040	ug/l	J		
307-24-4	Perflue	oroĥexano	oic acid	0.00895	0.0080	0.0040	ug/l			
375-85-9	Perflue	oroheptan	oic acid	ND	0.0080	0.0040	ug/l			
335-67-1	Perflue	orooctano	ic acid	0.00553	0.0080	0.0020	ug/l	J		
375-95-1	Perflue	orononan	oic acid	0.00417	0.0080	0.0020	ug/l	J		
335-76-2	Perflue	orodecand	oic acid	ND	0.0080	0.0040	ug/l			
2058-94-8	Perflue	oroundeca	anoic acid	ND	0.0080	0.0040	ug/l			
307-55-1	Perflue	orododeca	anoic acid	ND	0.0080	0.0040	ug/l			
72629-94-8	Perflue	orotrideca	noic acid	ND	0.0080	0.0040	ug/l			
376-06-7	Perflue	orotetrade	ecanoic acid	ND	0.0080	0.0040	ug/l			
PERFLUO	ROALK	YLSULI	FONATES							
375-73-5	Perflu	orobutane	sulfonic acid	0.0151	0.0080	0.0040	ug/l			
2706-91-4	Perflue	oropentan	esulfonic aci	d 0.0108	0.0080	0.0040	ug/l			
355-46-4	Perflue	orohexano	esulfonic acid	0.0523	0.0080	0.0040	ug/l			
375-92-8	Perflue	oroheptan	esulfonic aci	d ND	0.0080	0.0040	ug/l			
1763-23-1	Perflue	orooctane	sulfonic acid	0.0677	0.0080	0.0020	ug/l			
68259-12-1	Perflue	orononan	esulfonic acid	l ND	0.0080	0.0040	ug/l			
335-77-3	Perflue	orodecane	esulfonic acid	ND	0.0080	0.0040	ug/l			
PERFLUO	ROOCT	ANESUI	LFONAMID	ES						
754-91-6	PFOSA	A		ND	0.0080	0.0040	ug/l			
PERFLUO	ROOCT	ANESUI	LFONAMID	OACETIC AC	CIDS					
2355-31-9	MeFO	SAA		ND	0.020	0.0080	ug/l			
2991-50-6	EtFOS	AA		ND	0.020	0.0080	ug/l			
FLUOROT	ELOMI	ER SULF	ONATES							
757124-72-4	4 4:2 Flu	lorotelon	ner sulfonate	ND	0.020	0.0080	ug/l			
27619-97-2	6:2 Fh	iorotelor	er sulfonate	ND	0.020	0 0000	ug/1			

ND = Not detected MDL = Method Detection Limit

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

PFAS List			
Method: Proiect:	EPA 537 MOD EPA 537 MOD 1189850	Percent Solids:	n/a
Matrix:	AQ - Water	Date Received:	10/13/18
Lab Sample ID:	FA58382-1	Date Sampled:	10/09/18
Client Sample ID:	HR-1		

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0080	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	ts		
	13C2-PFHxA 13C2-PFDA	79% 82%	61-134% 62-128%			
	d5-EtFOSAA	69%		57-13	35%	

ND = Not detected MDL = Method Detection Limit 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

Page 2 of 2

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**Report of Analysis** 

Client Sam Lab Sample Matrix: Method: Project:	ple ID: MW-2 e ID: FA5838 AQ - Gr EPA 53 1189850	2-2 round Water 7 MOD EPA	4 537 MOD			Date Date Perc	e Sampled: e Received: ent Solids:	10/09/18 10/13/18 n/a	
	File ID	DF	Analyzed	By	Prep D	ate	Prep Batch	n Analytical Batch	
Run #1 <sup>a</sup>	Q54946.D	10	10/30/18 17:0	6 NAF	10/19/1	8 08:30	OP72261	SQ1265	
Run #2 <sup>a</sup>	Q54947.D	100	10/30/18 17:2	6 NAF	10/19/1	8 08:30	OP72261	SQ1265	
Run #3 b	Q55080.D	10	11/01/18 22:3	0 NAF	10/31/1	8 08:00	OP72428	SQ1267	
Run #4 <sup>b</sup>	Q55081.D	100	11/01/18 22:5	0 NAF	10/31/1	8 08:00	OP72428	SQ1267	
Run #1	<b>Initial Volume</b> 250 ml	Final Volur 1.0 ml	ne						
Run #2	250 ml	1.0 ml							
Run #3	250 ml	1.0 ml							
Run #4	250 ml	1.0 ml							
PFAS List									
CAS No.	Compound		Result	RL	MDL	Units	Q		
PERFLUO	PERFLUOROALKYLCARBOXYLIC ACIDS								
375-22-4	Perfluorobutance	oic acid	0.305	0.080	0.040	ug/l			
2706-90-3	Perfluoropentar	noic acid	0.532	0.080	0.040	ug/l			
307-24-4	Perfluorohexan	oic acid	1.89	0.080	0.040	ug/l			
375-85-9	Perfluoroheptar	noic acid	0.365	0.080	0.040	ug/l			
335-67-1	Perfluorooctanc	oic acid	1.05	0.080	0.020	ug/l			
375-95-1	Perfluorononan	oic acid	0.0283	0.080	0.020	ug/l	J		
335-76-2	Perfluorodecan	oic acid	ND	0.080	0.040	ug/l			
2058-94-8	Perfluoroundec	anoic acid	ND	0.080	0.040	ug/l			
307-55-1	Perfluorododec	anoic acid	ND	0.080	0.040	ug/l			
72629-94-8	Perfluorotrideca	anoic acid	ND	0.080	0.040	ug/l			
376-06-7	Perfluorotetrade	ecanoic acid	ND	0.080	0.040	ug/l			
PERFLUO	ROALKVESULI	FONATES							
375-73-5	Perfluorobutane	sulfonic acid	3.04	0.080	0.040	110/1			
2706-91-4	Perfluoropentar	esulfonic aci	1 3 97 °	0.000	0.010	110/1			
355-46-4	Perfluorohexan	esulfonic acid	23.5°	0.80	0.40	ug/1			
375-92-8	Perfluorohentar	esulfonic aci	d 2.19	0.080	0.040	110/1			
1763-23-1	Perfluorooctane	sulfonic acid	24.8°	0.80	0.20	ug/1			
68259-12-1	Perfluorononan	esulfonic acid	I ND	0.080	0.040	ug/1			
335-77-3	Perfluorodecane	esulfonic acid	ND	0.080	0.040	ug/l			
<b>DEDE:</b>						-			
PERFLUO	ROOCTANESU	LFONAMID	ES	0.000	0.040	/1			
/54-91-6	PFOSA		ND	0.080	0.040	ug/l			
PERFLUO	ROOCTANESU	LFONAMID	OACETIC A	CIDS					
2355-31-9	MeFOSAA		ND	0.20	0.080	ug/l			
2991-50-6	EtFOSAA		ND	0.20	0.080	ug/l			

ND = Not detected MDL = Method Detection Limit

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	5
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Client Samp Lab Sample Matrix: Method: Project:	le ID: MW-2 ID: FA58382-2 AQ - Ground Water EPA 537 MOD EPA 1189850	A 537 MOD	te Sampled: te Received: rcent Solids:	10/09/18 10/13/18 n/a			
PFAS List							
CAS No.	Compound	Result	RL	MDL Unit		Q	
FLUOROTI	ELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.20	0.080	ug/l		
27619-97-2	6:2 Fluorotelomer sulfonate	0.531	0.20	0.080	ug/l		
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.20	0.080	ug/l		
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run#	<b># 3</b>	Limits	
	13C2-PFHxA	96%	0% d	97%		61-134%	
	13C2-PFDA	67%	0% d	89%		62-128%	
	d5-EtFOSAA	44% e	0% d	68%		57-135%	

(a) Confirmed by re-extraction and reanalysis.

(b) Confirmation run.

(c) Result is from Run# 2

(d) Outside control limits due to dilution.

(e) Outside control limits.

- E = Indicates value exceeds calibration range
- J = Indicates an estimated value
- $\mathbf{B} =$  Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

Page 2 of 2

Report of	f Analysis
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Client Samj Lab Sample Matrix: Method: Project:	ple ID: MW-1 e ID: FA583 AQ - C EPA 5 118985	<ul> <li>ID: MW-1R</li> <li>FA58382-3 AQ - Ground Water EPA 537 MOD EPA 537 MOD 1189850</li> </ul>					Date Sampled:10/09/18Date Received:10/13/18Percent Solids:n/a					
D //1	File ID	DF	Analyzed	By	Prep D	ate	Prep Batch	Analytical Batch				
Run #1 Run #2	Q54928.D	10 100	10/30/18 10:55	NAF	10/19/1	8 08:30	OP72261 OP72261	SQ1264 SQ1265				
Run #2	U.94040	100	10/30/10 17.40	n Al	10/17/1	0 00.50	0172201	5Q1205				
	<b>Initial Volume</b>	Final Volu	me									
Run #1	260 ml	1.0 ml										
Run #2	260 ml	1.0 ml										
PFAS List												
CAS No.	Compound		Result	RL	MDL	Units	Q					
PERFLUO	ROALKYLCA	RBOXYLIC A	ACIDS									
375-22-4	Perfluorobutar	noic acid	0.0661	0.077	0.038	ug/l	J					
2706-90-3	Perfluoropenta	anoic acid	0.153	0.077	0.038	ug/l						
307-24-4	Perfluorohexa	noic acid	0.249	0.077	0.038	ug/l						
375-85-9	Perfluorohepta	anoic acid	0.0793	0.077	0.038	ug/l						
335-67-1	Perfluorooctar	Perfluorooctanoic acid		0.077	0.019	ug/l						
375-95-1	Perfluoronona	noic acid	0.123	0.077	0.019	ug/l						
335-76-2	Perfluorodeca	noic acid	ND	0.077	0.038	ug/l						
2058-94-8	Perfluorounde	canoic acid	0.0465	0.077	0.038	ug/l	J					
307-55-1	Perfluorodode	canoic acid	ND	0.077	0.038	ug/l						
72629-94-8	Perfluorotride	canoic acid	ND	0.077	0.038	ug/l						
376-06-7	Perfluorotetra	decanoic acid	ND	0.077	0.038	ug/l						
PERFLUO	ROALKYLSIII	FONATES										
375-73-5	Perfluorobuta	nesulfonic acid	0.479	0.077	0.038	<u>บ</u> g/1						
2706-91-4	Perfluoropenta	anesulfonic aci	d 0.336	0.077	0.038	ug/1						
355-46-4	Perfluorohexa	nesulfonic acid	1 5.59 <sup>a</sup>	0.77	0.38	ug/1						
375-92-8	Perfluorohepta	anesulfonic aci	d 2.27	0.077	0.038	ug/1						
1763-23-1	Perfluorooctar	nesulfonic acid	23.8 <sup>a</sup>	0.77	0.19	ug/l						
68259-12-1	Perfluoronona	nesulfonic acid	1 ND	0.077	0.038	ug/l						
335-77-3	Perfluorodeca	nesulfonic acid	ND	0.077	0.038	ug/l						
PERFLUO	POOCTANESI	II FONAMID	FS									
754-91-6	PFOSA	ULFUIAMID	ND	0.077	0.038	ug/l						
PERFLUO	ROOCTANESI	ULFONAMID	OACETIC AC	CIDS								
2355-31-9	MeFOSAA		ND	0.19	0.077	ug/l						
2991-50-6	EtFOSAA		ND	0.19	0.077	ug/l						
FLUOROT	FLOMER SIII	FONATES										
757124_72_4	1 4.2 Fluorotelo	mer sulfonate	ND	0 19	0.077	11 <del>0</del> /1						
27619-97-2	6.2 Fluorotelo	mer sulfonate	0.355	0.19	0.077	110/1						
	5.2 1 140101010		0.000	5.17	0.077	~B' 1						

ND = Not detected MDL = Method Detection Limit

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

Page 1 of 2

Client Samp Lab Sample Matrix: Method: Project:	ID:         MW-1R           ID:         FA58382-3           AQ - Ground Water           EPA 537 MOD         EPA           1189850	MW-1R FA58382-3 AQ - Ground Water EPA 537 MOD EPA 537 MOD 1189850			Date Sampled: Date Received: Percent Solids:				
PFAS List									
CAS No.	Compound	Result	RL	MDL	Units	Q			
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.19	0.077	ug/l				
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts				

13C2-PFHxA	102%	0% b	61-134%
13C2-PFDA	96%	0% b	62-128%
d5-EtFOSAA	76%	0% b	57-135%

(a) Result is from Run# 2

(b) Outside control limits due to dilution.

ND = Not detected MDL = Method Detection Limit 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

<b>Report of Analysis</b> Pa								
Client Sam Lab Sample Matrix: Method: Project:	ple ID: MW-3 e ID: FA583 AQ - 0 EPA 5 11898	382-4 Ground Water 337 MOD EP 50	4 537 MOD			Date Date Perc	Sampled: Received: ent Solids:	10/09/18 10/13/18 n/a
Run #1 Run #2	<b>File ID</b> Q54949.D Q54950.D	<b>DF</b> 1 20	<b>Analyzed</b> 10/30/18 18:06 10/30/18 18:25	<b>By</b> NAF NAF	<b>Prep Da</b> 10/19/13 10/19/13	ate 8 08:30 8 08:30	<b>Prep Batcl</b> OP72261 OP72261	n Analytical Batch SQ1265 SQ1265
Run #1 Run #2	<b>Initial Volume</b> 260 ml 260 ml	e Final Volu 1.0 ml 1.0 ml	me					
PFAS List								
CAS No.	Compound		Result	RL	MDL	Units	Q	
PERFLUO 375-22-4 2706-90-3 307-24-4 375-85-9 335-67-1 375-95-1 335-76-2 2058-94-8 307-55-1 72629-94-8 376-06-7 PERFLUO 375-73-5 2706-91-4 355-46-4 375-92-8 1763-23-1 68259-12-1 335-77-3	ROALKYLCA Perfluorobuta Perfluoropent Perfluorohept Perfluorocta Perfluorocta Perfluorodeca Perfluorodeca Perfluorotride Perfluorotetra ROALKYLSU Perfluorobuta Perfluorobuta Perfluorobuta Perfluoropent Perfluorohexa Perfluorocta Perfluoronca Perfluoronca	RBOXYLIC A noic acid anoic acid anoic acid anoic acid anoic acid anoic acid anoic acid anoic acid ecanoic acid ecanoic acid decanoic acid decanoic acid adecanoic acid anesulfonic acid	ACIDS 0.522 <sup>a</sup> 0.537 <sup>a</sup> 1.54 <sup>a</sup> 0.174 0.0635 0.0137 ND 0.00943 ND 0.0114 ND 4.81 <sup>a</sup> 4.81 <sup>a</sup> 4.5.59 <sup>a</sup> d 0.0539 0.355 H ND H ND	$\begin{array}{c} 0.15\\ 0.15\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.15\\ 0.15\\ 0.15\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ 0.0077\\ \end{array}$	0.077 0.077 0.0038 0.0019 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038 0.0077 0.077 0.077 0.077 0.0078 0.0019 0.0038 0.0038	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l		
PERFLUO	ROOCTANES	ULFONAMID	ES	0.0077	0.0020	/1		
<b>PERFLUO</b> 2355-31-9 2991-50-6 <b>FLUOROT</b> 757124-72-4 27619-97-2	ROOCTANES MeFOSAA EtFOSAA ELOMER SUI 4 4:2 Fluorotelo 6:2 Fluorotelo	ULFONAMID LFONATES omer sulfonate omer sulfonate	ND OACETIC AC ND ND ND 0.0292	CIDS 0.019 0.019 0.019 0.019 0.019	0.0077 0.0077 0.0077 0.0077	ug/l ug/l ug/l ug/l		

MDL = Method Detection Limit 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

Client Sample Lab Sample ID Matrix: Method: Project:	<ul> <li>MW-3</li> <li>FA58382-4</li> <li>AQ - Ground Wai</li> <li>EPA 537 MOD</li> <li>1189850</li> </ul>	ter EPA 537 MOD			Date S Date I Perce	Sampled: Received: nt Solids:	10/09/18 10/13/18 n/a
PFAS List							
CAS No. C	ompound	Result	RL	MDL	Units	Q	

39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.019 0	0.0077 ug/l
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA 13C2-PFDA d5-EtFOSAA	74% 79% 57%	0% b 0% b 0% b	61-134% 62-128% 57-135%

(a) Result is from Run# 2

(b) Outside control limits due to dilution.

ND = Not detected MDL = Method Detection Limit 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

	Page 1 of 2							
Client Samj Lab Sample Matrix: Method: Project:	DIE ID: EB-NAPA VH E ID: FA58382-5 AQ - Water EPA 537 MOD EPA 537 MOD 1189850				Date Sampled:10/09/18Date Received:10/13/18Percent Solids:n/a			
Run #1 Run #2	<b>File ID</b> Q54927.D	<b>DF</b> 1	<b>Analyzed</b> 10/30/18 10:35	By 5 NAF	<b>Prep Date</b> 10/19/18 08:30		Prep Batch OP72261	Analytical Batch SQ1264
Run #1 Run #2	<b>Initial Vol</b> 250 ml	ume Final Vo 1.0 ml	lume					
PFAS List								
CAS No.	Compour	ıd	Result	RL	MDL	Units	Q	
PERFLUO	ROALKYI	CARBOXYLI	CACIDS					
375-22-4	Perfluoro	butanoic acid	ND	0.0080	0.0040	ug/l		
2706-90-3	Perfluoro	pentanoic acid	ND	0.0080	0.0040	ug/l		
307-24-4	Perfluoro	hexanoic acid	ND	0.0080	0.0040	ug/l		
375-85-9	Perfluoro	heptanoic acid	ND	0.0080	0.0040	ug/l		
335-67-1	Perfluoro	octanoic acid	ND	0.0080	0.0020	ug/l		
375-95-1	Perfluoro	nonanoic acid	ND	0.0080	0.0020	ug/l		
335-76-2	Perfluoro	Perfluorodecanoic acid		0.0080	0.0040	ug/l		
2058-94-8	Perfluoro	undecanoic acid	ND	0.0080	0.0040	ug/l		
307-55-1	Perfluoro	dodecanoic acid	ND	0.0080	0.0040	ug/l		
72629-94-8	Perfluorotridecanoic acid		ND	0.0080	0.0040	ug/l		
376-06-7	Perfluoro	tetradecanoic aci	d ND	0.0080	0.0040	ug/l		
PERFLUO	ROALKYI	SULFONATES	5					
375-73-5	Perfluoro	butanesulfonic a	cid ND	0.0080	0.0040	ug/l		
2706-91-4	Perfluoro	pentanesulfonic	acid ND	0.0080	0.0040	ug/l		
355-46-4	Perfluoro	hexanesulfonic a	cid ND	0.0080	0.0040	ug/l		
375-92-8	Perfluoro	heptanesulfonic	acid ND	0.0080	0.0040	ug/l		
1763-23-1	Perfluoro	octanesulfonic a	cid 0.00230	0.0080	0.0020	ug/l	J	
68259-12-1	Perfluoro	nonanesulfonic a	icid ND	0.0080	0.0040	ug/l		
335-77-3	Perfluoro	decanesulfonic a	cid ND	0.0080	0.0040	ug/l		
PERFLUO	ROOCTAN	ESULFONAM	IDES					
754-91-6	PFOSA		ND	0.0080	0.0040	ug/l		
PERFLUO	ROOCTAN	ESULFONAM	IDOACETIC AC	CIDS				
2355-31-9	MeFOSA	А	ND	0.020	0.0080	ug/l		
2991-50-6	EtFOSAA	L	ND	0.020	0.0080	ug/l		
FLUOROT	ELOMER	SULFONATES	•					
757124-72-4	4 4:2 Fluor	otelomer sulfona	te ND	0.020	0.0080	ug/l		
27619-97-2	6:2 Fluor	otelomer sulfona	te ND	0.020	0.0080			

ND = Not detected MDL = Method Detection Limit

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

Project:	1189850			
Method:	EPA 537 MOD	EPA 537 MOD	Percent Solids:	n/a
Matrix:	AQ - Water		Date Received:	10/13/18
Lab Sample ID:	FA58382-5		Date Sampled:	10/09/18
Client Sample ID:	EB-NAPA VH			

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0080	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	13C2-PFHxA 13C2-PFDA d5-EtFOSAA	97% 95% 79%	61-134 62-128 57-135		34% 28% 35%	

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

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**Report of Analysis** 

Client Samj Lab Sample Matrix: Method: Project:	ole ID: MW- e ID: FA58 AQ - EPA 11898	4 382-6 Ground Water 537 MOD EPA 350	A 537 MOD			Date Date Perc	Sampled: Received: ent Solids:	10/ 10/ n/a	09/18 13/18
	File ID	DF	Analyzed	By	Prep Da	ate	Prep Batc	h	Analytical Batch
Run #1 <sup>a</sup>	Q54953.D	1	10/30/18 19:25	NAF	10/19/18	8 08:30	OP72261		SQ1265
Run #2 <sup>a</sup>	Q54954.D	10	10/30/18 19:45	NAF	10/19/18	8 08:30	OP72261		SQ1265
Run #3 b	Q55082.D	1	11/01/18 23:10	NAF	10/31/18	8 08:00	OP72428		SQ1267
Run #4 <sup>b</sup>	Q55083.D	10	11/01/18 23:30	NAF	10/31/18	8 08:00	OP72428		SQ1267
Run #1 Run #2 Run #3 Run #4	<b>Initial Volum</b> 250 ml 250 ml 250 ml 250 ml	e Final Volur 1.0 ml 1.0 ml 1.0 ml 1.0 ml 1.0 ml	ne						
		-							
rfað List									
CAS No.	Compound		Result	RL	MDL	Units	Q		
PERFLUO	ROALKYLCA	ARBOXYLIC A	CIDS						
375-22-4	Perfluorobuta	anoic acid	0.0624	0.0080	0.0040	ug/l			
2706-90-3	Perfluoropen	tanoic acid	0.0899	0.0080	0.0040	ug/l			
307-24-4	Perfluorohex	anoic acid	0.158	0.0080	0.0040	ug/l			
375-85-9	Perfluorohep	tanoic acid	0.0294	0.0080	0.0040	ug/l			
335-67-1	Perfluoroocta	anoic acid	0.0909	0.0080	0.0020	ug/l			
375-95-1	Perfluoronon	anoic acid	0.00675	0.0080	0.0020	ug/l	J		
335-76-2	Perfluorodec	anoic acid	ND	0.0080	0.0040	ug/l			
2058-94-8	Perfluoround	lecanoic acid	ND	0.0080	0.0040	ug/l			
307-55-1	Perfluorodod	lecanoic acid	ND	0.0080	0.0040	ug/l			
72629-94-8	Perfluorotrid	ecanoic acid	ND	0.0080	0.0040	ug/l			
376-06-7	Perfluorotetr	adecanoic acid	ND	0.0080	0.0040	ug/l			
PERFLUO	ROALKYLSU	LFONATES							
375-73-5	Perfluorobuta	anesulfonic acid	0.512 °	0.080	0.040	ug/l			
2706-91-4	Perfluoropen	tanesulfonic acid	1 0.248	0.0080	0.0040	ug/l			
355-46-4	Perfluorohex	anesulfonic acid	1.14 °	0.080	0.040	ug/l			
375-92-8	Perfluorohep	tanesulfonic acid	1 0.0821	0.0080	0.0040	ug/l			
1763-23-1	Perfluoroocta	anesulfonic acid	0.431 °	0.080	0.020	ug/l			
68259-12-1	Perfluoronon	anesulfonic acid	ND	0.0080	0.0040	ug/l			
335-77-3	Perfluorodec	anesulfonic acid	ND	0.0080	0.0040	ug/l			
PERFLUO	ROOCTANES	SULFONAMID	ES						
754-91-6	PFOSA		ND	0.0080	0.0040	ug/l			
PERFLUO	ROOCTANES	SULFONAMID	OACETIC AC	TIDS					
2355-31-9	MeFOSAA		ND	0.020	0.0080	ug/l			
2991-50-6	EtFOSAA		ND	0.020	0.0080	ug/l			

ND = Not detected MDL = Method Detection Limit

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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4.6 4

Report	of	Ana	lysis
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Client Samp Lab Sample Matrix: Method: Project:	lient Sample ID:MW-4ab Sample ID:FA58382-6latrix:AQ - Ground Waterlethod:EPA 537 MODroject:1189850					Da Da Per	te Sampled: te Received: rcent Solids:	10/09/18 10/13/18 n/a
PFAS List								
CAS No.	Comp	ound	Result	RL	MDL	Units	Q	
FLUOROTI	ELOME	ER SULFONATES						
757124-72-4	4:2 Flu	orotelomer sulfonate	ND	0.020	0.0080	ug/l		
27619-97-2	6:2 Flı	orotelomer sulfonate	0.112	0.020	0.0080	ug/l		
39108-34-4	8:2 Flı	orotelomer sulfonate	ND	0.020	0.0080	ug/l		
CAS No.	Surrog	gate Recoveries	Run# 1	Run# 2	Ru	n# 3	Limits	
	13C2-I	PFHxA	92%	86%	96%	6	61-134%	
	13C2-I	PFDA	69%	56% d	128	%	62-128%	
	d5-EtF	OSAA	46% d	41% d	89%	6	57-135%	

(a) Confirmed by re-extraction and reanalysis.

(b) Confirmation run.

(c) Result is from Run# 2

(d) Outside control limits.

- J = Indicates an estimated value
- $\mathbf{B}=~Indicates$  analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

E = Indicates value exceeds calibration range

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Client Samj Lab Sample Matrix: Method: Project:	ple ID: MW-4 e ID: FA583 AQ - C EPA 5 11898:	4 82-7 Ground Water 37 MOD EP 50	4 537 MOD			Date Date Perc	Sampled: Received: ent Solids:	10/09/18 10/13/18 n/a
Run #1 Run #2	<b>File ID</b> Q54955.D Q54933.D	<b>DF</b> 1 10	Analyzed 10/30/18 20:05 10/30/18 12:36	<b>By</b> NAF NAF	<b>Prep Da</b> 10/19/13 10/19/13	ate 8 08:30 8 08:30	<b>Prep Batc</b> OP72261 OP72261	h Analytical Batch SQ1265 SQ1264
Run #1 Run #2	<b>Initial Volume</b> 260 ml 260 ml	Final Volui 1.0 ml 1.0 ml	ne					
PFAS List								
CAS No.	Compound		Result	RL	MDL	Units	Q	
PERFLUO 375-22-4 2706-90-3 307-24-4 375-85-9 335-67-1 375-95-1 335-76-2 2058-94-8 307-55-1 72629-94-8 376-06-7 PERFLUO 375-73-5 2706-91-4 355-46-4 375-92-8 1763-23-1 68259-12-1	ROALKYLCA Perfluorobutat Perfluoropent: Perfluorohept: Perfluorohept: Perfluorooctat Perfluorodeca Perfluorodeca Perfluorodede Perfluorotride Perfluorotetra ROALKYLSUI Perfluorobutat Perfluorobutat Perfluoropent: Perfluorohept: Perfluoroctat Perfluoroctat Perfluoroctat Perfluoroctat Perfluoronona	RBOXYLIC A noic acid anoic acid noic acid noic acid noic acid noic acid noic acid canoic acid canoic acid decanoic acid decanoic acid decanoic acid anesulfonic acid anesulfonic acid anesulfonic acid anesulfonic acid anesulfonic acid anesulfonic acid	ACIDS 0.0595 0.100 0.172 0.0308 0.134 0.00902 ND ND ND ND ND ND ND ND ND ND	0.0077 0.0077 0.0077 0.0077 0.0077 0.0077 0.0077 0.0077 0.0077 0.0077 0.0077 0.077 0.077 0.077 0.077	0.0038 0.0038 0.0038 0.0019 0.0019 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038 0.0038	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l		
335-77-3	Perfluorodeca	nesulfonic acid	ND	0.0077	0.0038	ug/1 ug/1		
<b>PERFLUO</b> 754-91-6	ROOCTANES PFOSA	ULFONAMID	ES ND	0.0077	0.0038	ug/l		
<b>PERFLUO</b> 2355-31-9 2991-50-6 <b>FLUOROT</b> 757124-72-4 27619-97-2	ROOCTANES MeFOSAA EtFOSAA ELOMER SUI 4:2 Fluorotele 6:2 Fluorotele	ULFONAMID FONATES omer sulfonate omer sulfonate	OACETIC AC ND ND ND ND 0.167	<b>TDS</b> 0.019 0.019 0.019 0.019 0.019	0.0077 0.0077 0.0077 0.0077	ug/l ug/l ug/l ug/l		

ND = Not detectedMDL = Method Detection Limit

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

Client Samp Lab Sample Matrix: Method: Project:	De ID: MW-44 ID: FA58382-7 AQ - Ground Water EPA 537 MOD EPA 1189850	MW-44 FA58382-7 AQ - Ground Water EPA 537 MOD EPA 537 MOD 1189850					10/09/18 10/13/18 n/a	
PFAS List								
CAS No.	Compound	Result	RL	MDL	Units	Q		
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.019	0.0077	ug/l			

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
	13C2-PFHxA	82%	99%	61-134%	
	13C2-PFDA	83%	86%	62-128%	
	d5-EtFOSAA	57%	54% <sup>b</sup>	57-135%	

(a) Result is from Run# 2

(b) Outside control limits due to dilution.

ND = Not detected MDL = Method Detection Limit 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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SGS

				Report	of An	alysis			Page 1 of 2
Client Sample ID:FIELD BLANKLab Sample ID:FA58382-8Matrix:AQ - Field Blank WatMethod:EPA 537 MOD EPAProject:1189850		ater PA 537 MOD	r 537 MOD			Sampled: 1 Received: 1 ent Solids: n	0/09/18 0/13/18 /a		
Run #1 Run #2	<b>File ID</b> Q54926.D		<b>DF</b> 1	<b>Analyzed</b> 10/30/18 10:15	By NAF	<b>Prep Da</b> 10/19/13	ate 8 08:30	Prep Batch OP72261	<b>Analytical Batch</b> SQ1264
Run #1 Run #2	<b>Initial Volu</b> 260 ml	ıme	<b>Final Volu</b> 1.0 ml	ime					
PFAS List									
CAS No.	Compoun	d		Result	RL	MDL	Units	Q	
PERFLUO	ROALKYL	CAR	BOXYLIC	ACIDS					
375-22-4	Perfluorob	outanc	oic acid	ND	0.0077	0.0038	ug/l		
2706-90-3	Perfluorop	entan	oic acid	ND	0.0077	0.0038	ug/l		
307-24-4	Perfluoroh	exan	oic acid	ND	0.0077	0.0038	ug/l		
375-85-9	Perfluoroh	eptan	oic acid	ND	0.0077	0.0038	ug/l		
335-67-1	Perfluoroo	octano	oic acid	ND	0.0077	0.0019	ug/l		
375-95-1	Perfluoron	ionan	oic acid	0.00234	0.0077	0.0019	ug/l	J	
335-76-2	Perfluorod	lecano	oic acid	ND	0.0077	0.0038	ug/l		
2058-94-8	Perfluorou	indeca	anoic acid	ND	0.0077	0.0038	ug/l		
307-55-1	Perfluorod	lodeca	anoic acid	ND	0.0077	0.0038	ug/l		
72629-94-8	Perfluorot	rideca	anoic acid	ND	0.0077	0.0038	ug/l		
376-06-7	Perfluorot	etrade	ecanoic acid	ND	0.0077	0.0038	ug/l		
PERFLUO	ROALKYL	SULI	FONATES						
375-73-5	Perfluorob	outane	sulfonic aci	d ND	0.0077	0.0038	ug/l		
2706-91-4	Perfluorop	entan	esulfonic ac	id ND	0.0077	0.0038	ug/l		
355-46-4	Perfluoroh	exan	esulfonic aci	id ND	0.0077	0.0038	ug/l		
375-92-8	Perfluoroh	eptan	esulfonic ac	id ND	0.0077	0.0038	ug/l		
1763-23-1	Perfluoroo	octane	sulfonic aci	d 0.00440	0.0077	0.0019	ug/l	J	
68259-12-1	Perfluoron	ionan	esulfonic ac	id ND	0.0077	0.0038	ug/l		
335-77-3	Perfluorod	lecane	esulfonic aci	d ND	0.0077	0.0038	ug/l		
PERFLUO	ROOCTAN	ESUI	LFONAMI	DES					
754-91-6	PFOSA			ND	0.0077	0.0038	ug/l		
PERFLUO	ROOCTAN	ESUI	LFONAMI	DOACETIC AC	CIDS				
2355-31-9	MeFOSAA	4		ND	0.019	0.0077	ug/l		
2991-50-6	EtFOSAA			ND	0.019	0.0077	ug/l		
FLUOROT	ELOMER S	SULF	ONATES						
757124-72-4	4:2 Fluoro	telon	ner sulfonate	ND	0.019	0.0077	ug/l		
27(10 07 2	6.2 Elucro	. 1		ND	0.010		<i>.</i>		

ND = Not detected MDL = Method Detection Limit

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**

<b>Client Sample ID:</b>	FIELD BLANK		
Lab Sample ID:	FA58382-8	Date Sampled:	10/09/18
Matrix:	AQ - Field Blank Water	Date Received:	10/13/18
Method:	EPA 537 MOD EPA 537 MOD	Percent Solids:	n/a
Project:	1189850		

### **PFAS List**

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.019	0.0077	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
	13C2-PFHxA 13C2-PFDA	90% 92%	61-134% 62-128%		34% 28%	
	d5-EtFOSAA	81%		57-13	35%	

- J = Indicates an estimated value
- $\mathbf{B} =$  Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound
  - Page 70 of 77

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Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

• Chain of Custody





#### SGS North America Inc. CHAIN OF CUSTODY RECORD



Locations Nationwide Florida

Alaska

Texas

New Jersey

Colerado North Carolina

CLIENT:	SGS North An	nerica Inc Alask	a Division		SGS	S Refere	nce:		1		SGS,	FL		
CONTACT:	Julie Shumway	PHONE NO:	(907) 56	Additional Comments: All soils repo requested.		oils report out in dry weight unless otherwise					ige 1 of 1			
PROJECT	4400000	PWSID#:		-		Preserv-								
NAME:	1189850	NPDL#:	1.4.1.1		0	tised	NONE .							
REPORTS TO	8	E-MAIL:	Julie,Shumw	₩@sgs.com	T	TYPE G= COMP			111					
INVOICE TO:	SG5 - Alaska	QUOTE #: P.O. #:	1189	850	I N E	G = GRAB Multi Incte-	by 537M					-		
RESERVED	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/	R	Soils	PEO5	_		MS	MSD	SGS lab #	Location	D
TOF IAD USE	HR-1	10/9/2018	10:05	water	2	G	X	1	-	1	1	1189850001	1	
2	MW-2	10/9/2018	11:48	water	2	G	X	-	1.1.1	1 - 1	1.1	1189850002		
3	MW-1R	10/9/2018	12:48	water	2	G	X		1.	-	11.1	1189850003		
- ų	MW-3	10/9/2018	13:41	water	2	G	X	-	1		14 1	1189850004		17
5	EB-Napa VH	10/9/2018	14:04	water	2	G	X	1				1189850005		
6	MW-4	10/9/2018	15:15	water	2	G	X	1		· · · · · ·	1.00	1189850006		
1	MW-44	10/9/2018	15:25	water	2	G	X	1	+		1.	1189850007		-
8	Field Blank	10/9/2018	9:45	water	2	G	x	-				1189850009		
Relinquished	(Bý); (1)	Date	Time	Roceived E	By:					DOD P	Project?	NO	Data Deliverable Requ	irements:
11	humulay	10/12/18	0919	11.470	VRS	>	-	Cool	Report to ler ID:	DL (J	Flags)/	NU	Level 2 Report	DV EDD
Relinquieneo	VPS	Date	Time	Received f	By:			Req	uested T	urnaro	und Tim	e and-or Special Log in per	COC	
Relinguished	l By: (3)	Date	Time	Received I	Зу:			Tem	eport all	analy	ses for	Soils/Waters in	Chain of Custody S	re possible leal: (Circle)
Relinquished	i By: (4)	Date	Time	Received I	or Labo	oratory By	a 10/13	13		or A	Amblent	u –	INTACT BROKEN	ABSENT

[ ) 5500 Business Drive Wilmington, NC 28405 Tel: (910) 360-1903 Fax: (910) 350-1557

1189850\_PFC\_10.11.18.xls

FA58382: Chain of Custody Page 1 of 2



#### Job Number: FA58382 Client: SGS ALASKA Project: 1189850 Date / Time Received: 10/13/2018 11:00:00 AM Airbill #'s: 1za8619w4467046618 Delivery Method: FX Therm ID: IR 1; Therm CF: -0.2; # of Coolers: 1 Cooler Temps (Raw Measured) °C: Cooler 1: (2.1); Cooler Temps (Corrected) °C: Cooler 1: (1.9); Sample Information **Cooler Information** <u>Y</u> or N Y or Ν N/A ✓ 1. Custody Seals Present 1. Sample labels present on bottles ✓ ✓ 2. Custody Seals Intact 2. Samples preserved properly ✓ 3. Temp criteria achieved ✓ 3. Sufficient volume/containers recvd for analysis: ✓ 4. Cooler temp verification IR Gun 4. Condition of sample Intact 5. Cooler media Ice (Bag) 5. Sample recvd within HT ✓ 6. Dates/Times/IDs on COC match Sample Label ✓ Trip Blank Information <u>Y</u> or N N/A 7. VOCs have headspace ✓ 1. Trip Blank present / cooler ✓ 8. Bottles received for unspecified tests ✓ 2. Trip Blank listed on COC 9. Compositing instructions clear ✓ ✓ 10. Voa Soil Kits/Jars received past 48hrs? ✓ W or S <u>N/A</u> 11. % Solids Jar received? ✓ 3. Type Of TB Received ✓ 12. Residual Chlorine Present? ✓ Misc. Information Number of Encores: 25-Gram 5-Gram Number of 5035 Field Kits: Number of Lab Filtered Metals: Test Strip Lot #s: 230315 pH 10-12 219813A pH 0-3 Other: (Specify) Residual Chlorine Test Strip Lot #: Comments SAMPLE # 1 ID STATES ON BOTTLE "HW-1" CHAIN STATES ID "HR-1"

SM001 Rev. Date 05/24/17

Technician: PETERH

Date: 10/13/2018 11:00:00

Reviewer:

FA58382: Chain of Custody Page 2 of 2

Date:



### SGS Sample Receipt Summary





MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

• 7

### **Method Blank Summary**

Job Number:	FA58382
Account:	SGSAKA SGS North America, Inc
Project:	1189850

Sample OP72261-MB	<b>File ID</b> Q54910.D	<b>DF</b> 1	<b>Analyzed</b> 10/30/18	<b>By</b> NAF	<b>Prep Date</b> 10/19/18	Prep Batch OP72261	Analytical Batch SQ1264
The QC reporte	d here applies t	o the follo	wing samples:		]	Method: EPA 5	37 MOD

FA58382-1, FA58382-2, FA58382-3, FA58382-4, FA58382-5, FA58382-6, FA58382-7, FA58382-8

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0040	ug/1	
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.0040	ug/1	
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0080	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0040	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0080	0.0040	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0080	0.0040	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0080	0.0020	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0080	0.0040	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0080	0.0040	ug/l	
754-91-6	PFOSA	ND	0.0080	0.0040	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0080	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0080	ug/l	
757124-72-4	14:2 Fluorotelomer sulfonate	ND	0.020	0.0080	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.020	0.0080	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0080	ug/l	

### CAS No. Surrogate Recoveries

13C2-PFHxA	87%	61-134%
13C2-PFDA	94%	62-128%
d5-EtFOSAA	80%	57-135%

Limits

#### Page 1 of 1

6.1.1



### **Blank Spike Summary**

Job Number:	FA58382
Account:	SGSAKA SGS North America, Inc
Project:	1189850

Sample	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b> 10/30/18	<b>By</b>	<b>Prep Date</b>	Prep Batch	Analytical Batch
OP72261-BS	Q54909.D	1		NAF	10/19/18	OP72261	SQ1264
The QC reporte	ed here applies t	o the follo	wing samples:		-	Method: EPA 5	37 MOD

FA58382-1, FA58382-2, FA58382-3, FA58382-4, FA58382-5, FA58382-6, FA58382-7, FA58382-8

		Spike	BSP	BSP	
CAS No.	Compound	ug/l	ug/l	%	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0753	94	20-120
2706-90-3	Perfluoropentanoic acid	0.08	0.0764	96	40-131
307-24-4	Perfluorohexanoic acid	0.08	0.0701	88	63-146
375-85-9	Perfluoroheptanoic acid	0.08	0.0783	98	71-138
335-67-1	Perfluorooctanoic acid	0.08	0.0789	99	74-137
375-95-1	Perfluorononanoic acid	0.08	0.0672	84	76-140
335-76-2	Perfluorodecanoic acid	0.08	0.0722	90	65-148
2058-94-8	Perfluoroundecanoic acid	0.08	0.0718	90	57-138
307-55-1	Perfluorododecanoic acid	0.08	0.0632	79	58-118
72629-94-8	Perfluorotridecanoic acid	0.08	0.0559	70	52-120
376-06-7	Perfluorotetradecanoic acid	0.08	0.0474	59	49-122
375-73-5	Perfluorobutanesulfonic acid	0.0708	0.0670	95	73-148
2706-91-4	Perfluoropentanesulfonic acid	0.0752	0.0694	92	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0728	0.0682	94	74-142
375-92-8	Perfluoroheptanesulfonic acid	0.076	0.0737	97	74-123
1763-23-1	Perfluorooctanesulfonic acid	0.074	0.0787	106	70-134
68259-12-1	Perfluorononanesulfonic acid	0.0768	0.0657	86	70-130
335-77-3	Perfluorodecanesulfonic acid	0.0772	0.0514	67	56-127
754-91-6	PFOSA	0.08	0.0894	112	40-142
2355-31-9	MeFOSAA	0.08	0.0750	94	57-128
2991-50-6	EtFOSAA	0.08	0.0691	86	55-135
757124-72-4	14:2 Fluorotelomer sulfonate	0.0748	0.0715	96	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.076	0.0752	99	70-153
39108-34-4	8:2 Fluorotelomer sulfonate	0.0768	0.0860	112	61-154

CAS No.	Surrogate Recoveries	BSP	Limits		
	13C2-PFHxA	88%	61-134%		
	13C2-PFDA d5-EtFOSAA	95% 80%	62-128% 57-135%		

Page 1 of 1

6.2.1

FA58382

### Matrix Spike Summary

Job Number:	FA58382
Account:	SGSAKA SGS North America, Inc
Project:	1189850

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch	
OP72261-MS	Q54913.D	1	10/30/18	NAF	10/19/18	OP72261	SQ1264	
FA58428-2	Q54912.D	1	10/30/18	NAF	10/19/18	OP72261	SQ1264	

#### The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA58382-1, FA58382-2, FA58382-3, FA58382-4, FA58382-5, FA58382-6, FA58382-7, FA58382-8

		FA58428-	-2	Spike MS		IS MS		
CAS No.	Compound	ug/l	Q	ug/l	ug/	1	%	Limits
375-22-4	Perfluorobutanoic acid	0.0572		0 154	0.2	10	99	20-120
2706-90-3	Perfluoropentanoic acid	0.118		0.154	0.2	72	100	40-131
307-24-4	Perfluorobexanoic acid	0.188		0.154	0.2	12	81	63-146
375-85-9	Perfluorohentanoic acid	0.0521		0.154	0.2	01	97	71-138
335-67-1	Perfluorooctanoic acid	0.138		0.154	0.2	96	103	74-137
375-95-1	Perfluorononanoic acid	0.00579	T	0.154	0.1	41	88	76-140
335-76-2	Perfluorodecanoic acid	0.015 U		0.154	0.1	51	98	65-148
2058-94-8	Perfluoroundecanoic acid	0.015 U		0.154	0.1	45	94	57-138
307-55-1	Perfluorododecanoic acid	0.015 U		0.154	0.1	41	92	58-118
72629-94-8	Perfluorotridecanoic acid	0.015 U		0.154	0.1	40	91	52-120
376-06-7	Perfluorotetradecanoic acid	0.015 U		0.154	0.1	21	79	49-122
375-73-5	Perfluorobutanesulfonic acid	0.0601		0.136	0.192		97	73-148
2706-91-4	Perfluoropentanesulfonic acid	0.0591		0.145	0.1	89	90	70-130
355-46-4	Perfluorohexanesulfonic acid	0.661		0.14	0.8	06	104	74-142
375-92-8	Perfluoroheptanesulfonic acid	0.0148	J	0.146	0.1	59	99	74-123
1763-23-1	Perfluorooctanesulfonic acid	0.452		0.142	0.6	23	120	70-134
68259-12-1	Perfluorononanesulfonic acid	0.015 U		0.148	0.1	31	89	70-130
335-77-3	Perfluorodecanesulfonic acid	0.015 U		0.148	0.1	16	78	56-127
754-91-6	PFOSA	0.015 U		0.154	0.1	55	101	40-142
2355-31-9	MeFOSAA	0.038 U		0.154	0.1	48	96	57-128
2991-50-6	EtFOSAA	0.038 U		0.154	0.1	42	92	55-135
757124-72-4	14:2 Fluorotelomer sulfonate	0.038 U		0.144	0.1	31	91	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0629		0.146	0.2	10	101	70-153
39108-34-4	8:2 Fluorotelomer sulfonate	0.038 U		0.148	0.1	48	100	61-154
CAS No.	Surrogate Recoveries	MS		FA5842	8-2	Limi	ts	
	13C2-PFHxA	86%		92%		61-1.	34%	
	13C2-PFDA	97%		103%		62-12	28%	

81%

82%

57-135%

### Page 1 of 1

6.3.1

d5-EtFOSAA

FA58382

### Laboratory Data Review Checklist

### Completed By:

Scott Hummel

Title:

Chemist

### Date:

November 15, 2018

CS Report Name:

2018 GW Napa Van Horn

Report Date:

November 7, 2018

Consultant Firm:

NORTECH, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1189850

ADEC File Number:

100.38.242

Hazard Identification Number:

25865

### 1. Laboratory

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

• Yes O No 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 O No Comments: Samples that were submitted for perfluorinated compounds (PFCs) were transferred to, and analyzed, by SGS-Orlando. Other analyses were analyzed by SGS North America, Inc., in Anchorage, Alaska. 2. Chain of Custody (CoC) a. CoC information completed, signed, and dated (including released/received by)? • Yes O No Comments: Private well, HW-1, was identified and reported as HR-1. An additional COC was prepared by SGS for the PFC sample transfer, and that was completed correctly. b. Correct Analyses requested? • Yes O No Comments: 3. Laboratory Sample Receipt Documentation a. Sample/cooler temperature documented and within range at receipt  $(0^{\circ} \text{ to } 6^{\circ} \text{ C})$ ? • Yes O No Comments:

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

	• Yes	O No	Comments:		
c.	c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?				
	• Yes	O No	Comments:		

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

• Yes O No Comments:

Both sample receipt forms identify discrepancies between sample labels and COC for HW-1 which was written on the COC as *HR-1*. Samples for HW-1 are reported as *HR-1*.

e. Data quality or usability affected?

Comments:

Data quality and usability are not affected.

4. <u>Case Narrative</u>

a. Present and understandable?

• Yes • No Comments:

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

○ Yes ● No Comments:

There are no discrepancies or issues identified in the case narrative for SGS North America, in Anchorage, Alaska.

The case narrative for SGS-Orlando is extensive, noting that surrogate recoveries are outside of control limits due to dilution, and some samples were re-extracted for confirmation analysis.

c. Were all corrective actions documented?

• Yes O No Comments:

Dilution and re-extraction were documented.

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

Comments:

The case narrative does not identify any effect on data quality or usability.

### 5. Samples Results

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

• Yes O No Comments:

b. All applicable holding times met?

• Yes O No Comments:

- c. All soils reported on a dry weight basis?
  - Yes No Comments:

There were no soil samples submitted in this work order.

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

○ Yes ● No Comments:

LOQs exceed the ADEC cleanup level for the VOC analyte 1,2,3-trichloropropane, however their detection limits did not exceed the cleanup level.

e. Data quality or usability affected?

○ Yes ● No Comments:

Data quality or usability are not affected.

6. QC Samples

- a. Method Blank
  - i. One method blank reported per matrix, analysis and 20 samples?
  - Yes O No Comments:
  - ii. All method blank results less than limit of quantitation (LOQ)?

● Yes ○ No Comments:

The diesel range organics (DRO) method blank has a J-flag detection of 0.293 mg/L, below the LOQ.

iii. If above LOQ, what samples are affected?

Comments:

No samples are affected. The method blank detection was below the LOQ.

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

○ Yes ● No Comments:

There are no affected samples. No data flags are required.

v. Data quality or usability affected?

Comments:

Data quality and usability are not affected.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
  - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
  - Yes O No Comments:
  - ii. Metals/Inorganics one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
  - Yes No Comments:

No metals or inorganic analyses were requested in this work order.

- 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 O No Comments:
- iv. Precision All relative percent differences (RPD) 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 Comments:

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

Comments:

Reported %R and RPD meet acceptance limits for quality control samples. No samples are affected.

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

○ Yes ● No Comments:

No data flags are required.

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

Comments:

Data quality and usability are not affected.

- c. Surrogates Organics Only
  - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
  - Yes O No 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

Comments:

PFC analysis for samples: *MW-1R*, *MW-2*, *MW-3*, *MW-4*, and *MW-44* have reported surrogate recoveries outside of laboratory criteria due to sample dilution.

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
- Yes No Comments:

No data flags are required.

iv. Data quality or usability affected?

Comments:

Sample dilution does not affect data quality or usability. Samples which required dilution exceed the ADEC Action Levels.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil
  - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?

(If not, enter explanation below.)

• Yes O No

Comments:

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
- Yes No Comments:

iii. All results less than LOQ?

• Yes O No

Comments:

iv. If above LOQ, what samples are affected?

Comments:

There were no detections in the trip blank. No samples are affected.

v. Data quality or usability affected?

Comments:

Data quality and usability are not affected.

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

Comments:

• Yes O No

- ii. Submitted blind to lab?
- Yes No Comments:

Replicate sample pair MW-4/MW-44 was submitted in this work order.

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

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

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

○ Yes ● No

Comments:

PFC results for perfluorooctanoic acid, perfluorohexanesulfonic acid, perfluorohexanesulfonic acid, perfluorooctanesulfonic acid, and 6:2 fluorotelomer sulfonate exceed RPD criteria.

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

Comments:

Duplicate samples were diluted for reported values, which increases percent error at part per trillion (PPT) sensitivity. Sample results exceed ADEC Action Levels. Data quality and usability are not affected.

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

Sample *EB-Napa VH* was submitted in this work order.

i. All results less than LOQ?

○ Yes ● No Comments:

Toluene was detected in the equipment blank above the LOQ. Toluene was not detected in project samples.

Perfluooroctanesulfonic acid was detected below the LOQ in the EB. It was also detected in the laboratory-supplied *Field Blank*.

ii. If above LOQ, what samples are affected?

Comments:

No samples had a detected toluene result. No samples are affected.

iii. Data quality or usability affected?

Comments:

Data quality and usability are not affected.

- 7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
  - a. Defined and appropriate?
    - Yes O No

Comments:

There are no additional data flags or qualifiers in the laboratory reports.



### Laboratory Report of Analysis To: Nortech 2450 College Road Fairbanks, AK 99709 (907)452-5688 Report Number: 1199048 Client Project: NAPA-Van Horn 17-1001 Dear Scott Hummel, 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 Jennifer 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. Stephen Ede 2019.03.06 Sincerely, SGS North America Inc. Alaska Division Technical Director 10:46:57 -09'00' Jennifer Dawkins Date Project Manager Jennifer.Dawkins@sgs.com

Print Date: 03/06/2019 10:32:32AM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com Results via Engage

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#### **Case Narrative**

SGS Client: Nortech SGS Project: 1199048 Project Name/Site: NAPA-Van Horn 17-1001 Project Contact: Scott Hummel

Refer to sample receipt form for information on sample condition.

#### MW-4 (1199048001) PS

EPA 537 MOD- AFCEE PFAS23 was 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: 03/06/2019 10:32:33AM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com

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Sample Summary						
Client Sample ID	Lab Sample ID	Collected	<b>Received</b>	Matrix		
MW-4	1199048001	02/13/2019	02/15/2019	Water (Surface, Eff., Ground)		
MW-3	1199048002	02/13/2019	02/15/2019	Water (Surface, Eff., Ground)		
MW-33	1199048003	02/13/2019	02/15/2019	Water (Surface, Eff., Ground)		
EB-1	1199048004	02/13/2019	02/15/2019	Water (Surface, Eff., Ground)		
MW-1R	1199048005	02/13/2019	02/15/2019	Water (Surface, Eff., Ground)		
Field Blank-1	1199048006	02/13/2019	02/15/2019	Water (Surface, Eff., Ground)		
MW-2	1199048007	02/13/2019	02/15/2019	Water (Surface, Eff., Ground)		

Method

Method Description

Print Date: 03/06/2019 10:32:36AM

								West	Virgina <u>www.us.sgs</u>	Kentucky .com
NORTECH				5	structions	Sections may delay	v the onset	t be filled of analysis	out. s.	1.1
T: Scatt Hummer	E NO:	452-5	688	Section	1		Preservativ			Page or
VAPA-Van HORY PERMIT	第 ノフィ	1001.		<b>#</b> 0	uc)					
STO: Scott Hammel E-MAI	L: - bauna	el Dubuta	hence 100	0 2 +	. 22					
TO: QUOT ORTECH P.O.#	E#: 17-	-100		< - z	E_S #					
/ED SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX	ш к. v E E S	E DI DI			•		REMARKS/ LOC ID
3 MW-4 C	21/2/120	1157	Watek	2	×					
B mw-3 0	22/13/19	1304		2	×					
3 MW-33 0	2113/19	1306		2	×					
3 E8-1 0	2113/19	1340		N	×					
S MW-IR 0	2/13/19	1434	12.0	2	×					
B Field Blank-1 0	61/21/2	1400	/	2	×					
B MW-2 0.	2113/19	1526	A	2	X					
shed By: (1)	ate	Time	Received By:	R	(r (rg	Section	4 DOD Proj	ect? Yes No	Data Delive	rable Requirements:
Hde Munch 3	dula	Con.Hl	Y		00:11	Cooler ID	ä			
shed By: (2)	ate Di to	Time 1 C.A.	Received By:			Requested	Turnaround Ti	me and/or Spe	cial Instruction	
shed By: (3) Di	d-17-14	Time	Received By:			Run	Same 11	57 45	2018 116	89850
						Temp Blan	k°c: 3,7	25	Chain of C	ustody Seal: (Circle)
shed By: (4) Di	ate 2/15/19	Time 11/7	Received For	Laboratory	By: CmS	(See atta	or Ambient Iched Sample R	[ ] eceipt Form)	INTACT   (See attached	BROKEN ABSENT





# FAIRBANKS SAMPLE RECEIPT FORM

Note: This form is to be completed by Fairbanks Receiving Staff for all samples

Review Criteria:	С	onditio	n:	Comments/Actions Taken
COC accompanied samples?	Yes	No	N/A	Exemption permitted if sampler hand
Temperature blank compliant* (i.e., 0-6°C)         If > 6°C, were samples collected <8 hours ago?	Yes Yes Yes	No No No	N/A N/A	carries/delivers. DExemption permitted if chilled & collected <8hrs ago Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is useded
Delivery Method: Client (hand carried) Other:	Trac Or s	cking/A	B# : ched	y and space is necucu.
→For samples received with payment, note amount (\$ ) and when	ther cash	/ chal	ICC (-	
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	E.	No	N/A	Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Vec	No	(T/A)	
For RUSH/SHORT Hold Time, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes	No	NA	
Additional notes (if applicable):				
Profile #: 367417 Note to Client: any "no" circled above indicates non-compliance w	ith standard	d proced	ures and me	ıy impact data quality.

SGS Workorder #:       1199048         Note or the transmission of the second of t	000	e-Sam <u>r</u>	ole Receip	t Form				
Review Criteria       Developmentation (res. to, tw)       Exceptions Noted below         Chain of Custody / Jemperature Requirements       INA       Exemption permitted if sampler hand carries/delivers.         Were Cutody Seals interact Note #8 location       IF.1-8       INA       Exemption permitted if sampler hand carries/delivers.         Were Cutody Seals interact Note #8 location       IF.1-8       INA       IF.1-8         COC accompanied samples?       INA       IF.1-8         IMA       "Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required         IMA       "Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required         IMA       "Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required         Image: Ima	SGS	SGS Workorder #:	1	19904	48		9 9 0 4	8
Chain of Custody / Temperature Requirements         Write Custody Seals Inted? Note # & location from 1+F, 1+8         COC accompanied sample? Yea         Coc accompanied sample? Yea         Image: Temperature blank compliant* (i.e., 0+6 °C after CF)?       1       0       0.6° C Therm. ID.       0.8°         Temperature blank compliant* (i.e., 0+6 °C after CF)?       Cooler ID       0       0       0.6° C Therm. ID.       0.8°         Cooler ID       0       0       0.6° C Therm. ID.       0.8°       0.6° C Therm. ID.       0.8°         Cooler ID       0       0.6° C Therm. ID.       0.6° C Therm. ID.       0.6° C Therm. ID.       0.6°       0.6° C Therm. ID.         1f <0°C, were samples collected <8 hours ago?       Via       Cooler ID.       0.8° C Therm. ID.       0.6° C Therm. ID.         1f <0°C, were samples collected <8 hours ago?       Via       Cooler ID.       0.8° C Therm. ID.       0.6° C Therm. ID.         1f <0°C, were samples collected <8 hours ago?       Via       Cooler ID.       0.8° C Therm. ID.       0.6° C Therm. ID.         1f <0°C, were samples collected <8 hours ago?       Via       Via       Cooler ID.       0.8° C Therm. ID.         1f <0°C, were sample containers ice free?       Via       Via       Via       Cooler ID.       0.8	Revi	iew Criteria	Condition (Yes	No, N/A	Exc	eptions Note	d below	
Were Custody Seals indad? Note # & location       147, 1-8         CCC accompanied samples?       Color 10:       1       0.0       0.0       C       Them. ID:       D       D       0.0       C       C       Them. ID:       D       D       0.0       C       C       Them. ID:       D       C       <	Chain of	Custody / Temperature Require	rements	N//	A Exemption pe	ermitted if sample	er hand carries/deli	vers.
COC accompanied samples?         Image: "Exemption permitted if childe & coloride 48 hours ago, or for samples where chilling is not required         Temperature blank compliant" (i.e., 0-6 °C after CF)?         Cooler ID       0         If <0°C, were samples collected <8 hours ago, Cooler ID		Were Custody Seals intact? Note # &	location Yes	1-F, 1-B				
Image: Second		COC accompanied sa	amples? <b>Yes</b>					
Yee       Cooler ID:       1       0.6       0.6       C       Them. ID:       0.6         Temperature blank compliant* (i.e., 0.6 *C after CF)?       Cooler ID:       0       0       C       Them. ID:         Cooler ID:       0       0       C       Them. ID:       0       Cooler ID:       0       0       C       Them. ID:         'If >6°C, were samples collected <8 hours ago?		N/A **Exemption permitted if	chilled & colle	cted <8 hour	s ago, or for sar	nples where chill	ng is not required	_
Temperature blank compliant* (i.e., 0-6 °C after CF)?       Cooler ID:       @       C Them. ID:         Cooler ID:       @       C Them. ID:       Cooler ID:       @       C Them. ID:         'If >6°C, were samples collected <8 hours ago?			Yes	Cooler ID:	1	@	0.6 °C Therm. ID	D56
Temperature blank compliant* (i.e., 0-6 °C after CF)?       Cooler ID:	Temperature blank compliant* (i.e., 0-6 °C after CF			Cooler ID:		@	°C Therm. ID	:
Coler ID:			er CF)?	Cooler ID:		@	°C Therm. ID	:
Cooler ID:       Cooler ID: <td></td> <td>Cooler ID:</td> <td></td> <td>@</td> <td>°C Therm. ID</td> <td>:</td>				Cooler ID:		@	°C Therm. ID	:
"If >6"C, were samples collected <8 hours ago?			Cooler ID:		@	°C Therm. ID	:	
If <0°C, were sample containers ice free? NA If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled". Note: Identify containers received at non-compliant temperature. Use form F5-0029 if more space is needed. Holding Time / Documentation / Sample Condition Requirements Were samples received within holding time? Were samples received within holding time? Toosamples match COC** (i.e., sample IDs,dates/times collected)? Were analyses requested unambiguous? (i.e., method is specified for Were proper containers (type/mass/volume/preservative***)used? Were proper containers (type/mass/volume/preservative***)used? Were analyses requested unambiguous? (i.e., bubbles ≤ form)? Were all water VOA vials free of headspace (i.e., bubbles ≤ form)? Were all soil VOAs field extracted with MeOH+BFB? Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. Additional notes (if applicable):	*lf >6°C	C, were samples collected <8 hours	ago? N/A					
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled". Note: Identify containers received at non-compliant temperature . Use form FS-0020 if more space is needed. Holding Time / Documentation / Sample Condition Requirements Were samples received within holding time? Were samples received within holding time? Too samples match COC** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous? (i.e., method is specified for Yos analyses with >1 option for analysis) Were proper containers (type/mass/volume/preservative***)used? Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? Were all soit VOAs field extracted with theOH+BFB? NA Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. Additional notes (if applicable):		If <0°C were sample containers iss	froo?					
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled". Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed. Holding Time / Documentation / Sample Condition Requirements Were samples received within holding time? Vere samples received within holding time? Do samples match COC** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis) Were proper containers (type/mass/volume/preservative***)used? Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with sample?? Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? Were all soil VOAs field extracted with MeOH+BFB? Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. Additional notes (if applicable):		in <0 C, were sample containers ice						
In samples locking       In locking will be doted in lieu of the temperature blank &         "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".         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         "Note: If times differ <1hr, record details & login per COC.	If samples receive	d without a temperature blank, the	"cooler					
"COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".         Note: Identify containers received at non-compliant temperature .         Use form FS-0029 if more space is needed.         Holding Time / Documentation / Sample Condition Requirements.         Note: Identify containers received within holding time?         Yes         Were samples received within holding time?         Yes         "Note: If times differ <1hr, record details & login per COC.	temperature" will be docu	umented in lieu of the temperature b	blank &					
temp blank nor cooler temp can be obtained, note "ambient" or "chilled". Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed. Holding Time / Documentation / Sample Condition Requirements Were samples received within holding time? Yes Do samples match COC** (i.e., sample IDs, dates/times collected)? **Note: If times differ <1hr, record details & login per COC. Were analyses requested unambiguous? (i.e., method is specified for yes analyses with >1 option for analysis) Were proper containers (type/mass/volume/preservative***)used? Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples? Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? Were all soil VOAs field extracted with MeOH+BFB? NAA Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. Additional notes (if applicable):	"COOLER TEMP" will be no	oted to the right. In cases where ne	either a					
Chilled".         Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.         Holding Time / Documentation / Sample Condition Requirements Were samples received within holding time?       Note: Refer to form F-083 "Sample Guide" for specific holding times.         Do samples match COC** (i.e., sample IDs, dates/times collected)?       Yes         **Note: If times differ <1hr, record details & login per COC.	temp blank nor coole	r temp can be obtained, note "ambi	ient" or					
Note:       Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.         Holding Time / Documentation / Sample Condition Requirements Were samples received within holding time?       Note: Refer to form F-083 "Sample Guide" for specific holding times.         Do samples match COC** (i.e., sample IDs, dates/times collected)?       Yes         **Note:       If times differ <1hr, record details & login per COC.         Were analyses requested unambiguous? (i.e., method is specified for Yes analyses with >1 option for analysis)       IN/A ***Exemption permitted for metals (e.g. 200.8/6020A).         Were proper containers (type/mass/volume/preservative***)used?       Yes         Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?       IN/A         Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?       IN/A         Were all soil VOAs field extracted with MeOH+BFB?       IN/A         Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.         Additional notes (if applicable):       Additional notes (if applicable):		°C	chilled".					
Use form FS-0029 if more space is needed. Holding Time / Documentation / Sample Condition Requirements Were samples received within holding time? Yes The samples match COC** (i.e., sample IDs,dates/times collected)? Yes **Note: If times differ <1hr, record details & login per COC. Were analyses requested unambiguous? (i.e., method is specified for Yes analyses with >1 option for analysis) 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? NAA Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? Were all voAs field extracted with MeOH+BFB? NAA NAA NAA Additional notes (if applicable):	Note: Identify container	s received at non-compliant temper	rature .					
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.	U	se form FS-0029 if more space is no	eeded.					
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.	Holding Time / Do	cumentation / Sample Condition Re	equirements	Note: Refer	to form F-083 "S	Sample Guide" fo	r specific holding t	imes.
Do samples match COC** (i.e., sample IDs, dates/times collected)?       Yes         **Note: If times differ <1hr, record details & login per COC.	We	ere samples received within holding	g time? Yes					
Do samples match COC** (i.e.,sample IDs,dates/times collected)? Yes **Note: If times differ <1hr, record details & login per COC. Were analyses requested unambiguous? (i.e., method is specified for Yes analyses with >1 option for analysis) 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)? Were all soil VOAs field extracted with MeOH+BFB? N/A Were all soil VOAs field extracted with MeOH+BFB? N/A Additional notes (if applicable):			<u> </u>					
Do samples match COC** (i.e., sample IDs,dates/times collected)? Yes **Note: If times differ <1hr, record details & login per COC. Were analyses requested unambiguous? (i.e., method is specified for Yes analyses with >1 option for analysis) 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):								
**Note: If times differ <1hr, record details & login per COC. Were analyses requested unambiguous? (i.e., method is specified for Yes analyses with >1 option for analysis) 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):	Do samples match COC	** (i.e.,sample IDs,dates/times colle	ected)? Yes					
Were analyses requested unambiguous? (i.e., method is specified for ranalysis) 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):	**Note: If times d	liffer <1hr, record details & login per	r COC.					
analyses with >1 option for analysis)         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)?         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):	Were analyses requested u	nambiguous? (i.e., method is specif	fied for Yes					
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):		analyses with >1 option for an	nalysis)					
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+BFR?       N/A         Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.         Additional notes (if applicable):				N/	A ***Exemption	permitted for me	tals (e.g,200.8/60	20A).
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):	Were proper containers	(type/mass/volume/preservative***	)used? Yes	I "				
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):		Volatile / LL-Hg Reg	uirements					
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)? Were all soil VOAs field extracted with MeOH+BF8? N/A Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. Additional notes (if applicable):	Were Trip Blanks (i	.e., VOAs, LL-Hg) in cooler with sar	mples? 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):	Were all water VOA vials	free of headspace (i.e., bubbles ≤ 0	6mm)? N/A	1				
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality. Additional notes (if applicable):	Were all so	oil VOAs field extracted with MeOH	+BFB? N/A					
Additional notes (if applicable):	Note to Clien	t: Any "No", answer above indicates no	n-compliance	with standard	d procedures and	d may impact dat	a quality.	
		Additiona	al notes (if a	applicable):				



### **Sample Containers and Preservatives**

<u>Container Id</u>	<u>Preservative</u>	<u>Container</u> Condition	Container Id	<u>Preservative</u>	<u>Container</u> Condition
1199048001-A	No Preservative Required	ОК			
1199048001-B	No Preservative Required	OK			
1199048002-A	No Preservative Required	OK			
1199048002-B	No Preservative Required	OK			
1199048003-A	No Preservative Required	OK			
1199048003-B	No Preservative Required	OK			
1199048004-A	No Preservative Required	ОК			
1199048004-B	No Preservative Required	OK			
1199048005-A	No Preservative Required	OK			
1199048005-B	No Preservative Required	OK			
1199048006-A	No Preservative Required	ОК			
1199048006-B	No Preservative Required	OK			
1199048007-A	No Preservative Required	OK			
1199048007-В	No Preservative Required	ОК			

#### 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.

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.



### **Orlando, FL**



**Automated Report** 

e-Hardcopy 2.0

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

### **Technical Report for**

### SGS North America, Inc

1199048

SGS Job Number: FA61698



Sampling Date: 02/13/19

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: **32**



aitlinkin

Caitlin Brice, M.S. General Manager

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.

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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Please share your ideas about how we can serve you better at: EHS.US.CustomerCare@sgs.com



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# Sample Summary

SGS North America, Inc

1199048

Sample Number	Collected Date	Time By	Received	Matr: Code	ix Type	Client Sample ID
FA61698-1	02/13/19	11:57 JS	02/19/19	AQ	Ground Water	MW-4
FA61698-2	02/13/19	13:04 JS	02/19/19	AQ	Ground Water	MW-3
FA61698-3	02/13/19	13:06 JS	02/19/19	AQ	Ground Water	MW-33
FA61698-4	02/13/19	13:40 JS	02/19/19	AQ	Equipment Blank	EB-1
FA61698-5	02/13/19	14:34 JS	02/19/19	AQ	Ground Water	MW-1R
FA61698-6	02/13/19	14:00 JS	02/19/19	AQ	Field Blank Water	FIELD BLANK-1
FA61698-7	02/13/19	15:26 JS	02/19/19	AQ	Ground Water	MW-2

**Job No:** FA61698



#### SAMPLE DELIVERY GROUP CASE NARRATIVE

Client:	SGS North America, Inc	Job No	FA61698
Site:	1199048	Report Date	3/1/2019 10:18:51

6 Samples and 1 Field Blank(s) were collected on 02/13/2019 and were received at SGS North America Inc - Orlando on 02/19/2019 properly preserved, at 3.1 Deg. C and intact. These samples received an SGS Orlando job number of FA61698. 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 537 MOD

Matrix: AQ Batch ID: OP73880

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA61695-1MS, FA61697-1DUP, FA61695-1MS were used as the QC samples indicated.

Matrix Spike Recovery(s) for 4:2 Fluorotelomer sulfonate, 6:2 Fluorotelomer sulfonate, 8:2 Fluorotelomer sulfonate, EtFOSAA, MeFOSAA, Perfluorobutanesulfonic acid, Perfluorobutanoic acid, Perfluorodecanesulfonic acid, Perfluorodecanesulfonic acid, Perfluoroheptanesulfonic acid, Perfluoroheptanoic acid, Perfluoroheptanesulfonic acid, Perfluoronexanesulfonic acid, Perfluoroxexanesulfonic acid, P

Sample(s) FA61698-5, FA61698-7 have surrogates outside control limits.

FA61698-5 for 13C2-PFDA: Outside control limits due to dilution.

FA61698-5 for 13C2-PFHxA: Outside control limits due to dilution.

FA61698-5 for d5-NEtFOSAA: Outside control limits due to dilution.

FA61698-7 for 13C2-PFDA: Outside control limits due to dilution.

FA61698-7 for 13C2-PFDA: Outside control limits due to dilution.

FA61698-7 for 13C2-PFHxA: Outside control limits due to dilution.

FA61698-7 for 13C2-PFHxA: Outside control limits due to dilution.

FA61698-7 for d5-NEtFOSAA: Outside control limits due to dilution. FA61698-7 for d5-NEtFOSAA: Outside control limits due to dilution.

#### Matrix: AQ Batch ID: OP73950

All samples were extracted within the recommended method holding time. All samples were analyzed within the recommended method holding time. All method blanks for this batch meet method specific criteria. Sample(s) FA61698-2, FA61698-3 have surrogates outside control limits. OP73950-BS: Insufficient sample for MS/MSD. FA61698-2 for 13C2-PFDA: Outside control limits due to dilution. FA61698-2 for 13C2-PFHxA: Outside control limits due to dilution. FA61698-2 for 13C3-HFPO-DA: Outside control limits due to dilution. FA61698-2 for 13C3-HFPO-DA: Outside control limits due to dilution. FA61698-2 for d5-NEtFOSAA: Outside control limits due to dilution. FA61698-3 for 13C2-PFDA: Outside control limits due to dilution. FA61698-3 for 13C2-PFHxA: Outside control limits due to dilution. FA61698-3 for 13C3-HFPO-DA: Outside control limits due to dilution. FA61698-3 for 13C3-HFPO-DA: Outside control limits due to dilution. FA61698-3 for d5-NEtFOSAA: Outside control limits due to dilution. FA61698-3 for d5-NEtFOSAA: Outside control limits due to dilution.

FA61698

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:	FA61698
Account:	SGS North America, Inc
Project:	1199048
Collected:	02/13/19

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA61698-1	MW-4					
Perfluorobutanoi	c acid	0.0544	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluoropentano	ic acid	0.0882	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorohexanoi	c acid	0.114	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluoroheptano	ic acid	0.0286	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorooctanoi	e acid	0.0885	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorononanoi	ic acid	0.00313 J	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorobutanes	ulfonic acid	0.523	0.077	0.038	ug/l	EPA 537 MOD
Perfluoropentane	sulfonic acid	0.171	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorohexanes	sulfonic acid	0.887	0.077	0.038	ug/l	EPA 537 MOD
Perfluoroheptane	sulfonic acid	0.119	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorooctanes	ulfonic acid	0.705	0.077	0.038	ug/l	EPA 537 MOD
6:2 Fluorotelome	er sulfonate	0.0952	0.019	0.015	ug/l	EPA 537 MOD
FA61698-2	MW-3					
Perfluorobutanoi	c acid	0.342	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluoropentano	ic acid	0.464	0.077	0.038	ug/l	EPA 537 MOD
Perfluorohexanoic acid		1.22	0.077	0.038	ug/l	EPA 537 MOD
Perfluoroheptano	ic acid	0.200	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorooctanoi	c acid	0.0588	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorononanoi	ic acid	0.00319 J	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorobutanes	ulfonic acid	3.51	0.077	0.038	ug/l	EPA 537 MOD
Perfluoropentane	sulfonic acid	3.05	0.077	0.038	ug/l	EPA 537 MOD
Perfluorohexanes	sulfonic acid	6.00	0.15	0.077	ug/l	EPA 537 MOD
Perfluoroheptane	sulfonic acid	0.0152	0.0077	0.0038	ug/l	EPA 537 MOD
Perfluorooctanes	ulfonic acid	0.0552	0.0077	0.0038	ug/l	EPA 537 MOD
FA61698-3	MW-33					
Perfluorobutanoi	c acid	0.349	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluoropentano	ic acid	0.402	0.080	0.040	ug/l	EPA 537 MOD
Perfluorohexanoi	c acid	1.06	0.080	0.040	ug/l	EPA 537 MOD
Perfluoroheptano	ic acid	0.204	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorooctanoi	c acid	0.0632	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorononanoi	ic acid	0.00321 J	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorobutanes	ulfonic acid	3.10	0.080	0.040	ug/l	EPA 537 MOD
Perfluoropentane	sulfonic acid	2.62	0.080	0.040	ug/l	EPA 537 MOD
Perfluorohexanes	sulfonic acid	5.74	0.16	0.080	ug/l	EPA 537 MOD
Perfluoroheptane	sulfonic acid	0.0161	0.0080	0.0040	ug/l	EPA 537 MOD
Perfluorooctanes	ulfonic acid	0.0580	0.0080	0.0040	ug/l	EPA 537 MOD

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FA61698

# Summary of Hits

Job Number:	FA61698
Account:	SGS North America, Inc
Project:	1199048
Collected:	02/13/19

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method			
FA61698-4	EB-1								
No hits reported in this sample.									
FA61698-5	MW-1R								
Perfluorobutanoic acid		0.143	0.0077	0.0038	ug/1	EPA 537 MOD			
Perfluoropentanoic acid		0.194	0.0077	0.0038	ug/l	EPA 537 MOD			
Perfluorohexanoic acid		0.340	0.0077	0.0038	ug/l	EPA 537 MOD			
Perfluoroheptanoic acid		0.0668	0.0077	0.0038	ug/l	EPA 537 MOD			
Perfluorooctanoic acid		0.222	0.0077	0.0038	ug/l	EPA 537 MOD			
Perfluorononanoic acid		0.0132	0.0077	0.0038	ug/l	EPA 537 MOD			
Perfluorobutanesulfonic acid		1.38	0.038	0.019	ug/l	EPA 537 MOD			
Perfluoropentanesulfonic acid		0.599	0.038	0.019	ug/l	EPA 537 MOD			
Perfluorohexanesulfonic acid		4.13	0.38	0.19	ug/l	EPA 537 MOD			
Perfluoroheptanesulfonic acid		0.830	0.038	0.019	ug/l	EPA 537 MOD			
Perfluorooctanesulfonic acid		16.9	0.38	0.19	ug/l	EPA 537 MOD			
6:2 Fluorotelomer sulfonate		0.202	0.019	0.015	ug/l	EPA 537 MOD			
FA61698-6	FIELD BLANK-1								
No hits reported in this sample.									

### FA61698-7 MW-2

Perfluorobutanoic acid	0.467	0.042	0.021	ug/l	EPA 537 MOD
Perfluoropentanoic acid	0.566	0.042	0.021	ug/l	EPA 537 MOD
Perfluorohexanoic acid	1.88	0.042	0.021	ug/l	EPA 537 MOD
Perfluoroheptanoic acid	0.396	0.042	0.021	ug/l	EPA 537 MOD
Perfluorooctanoic acid	0.853	0.042	0.021	ug/l	EPA 537 MOD
Perfluorononanoic acid	0.0261 J	0.042	0.021	ug/l	EPA 537 MOD
Perfluorobutanesulfonic acid	5.02	0.42	0.21	ug/l	EPA 537 MOD
Perfluoropentanesulfonic acid	3.89	0.42	0.21	ug/l	EPA 537 MOD
Perfluorohexanesulfonic acid	19.0	2.1	1.0	ug/l	EPA 537 MOD
Perfluoroheptanesulfonic acid	2.15	0.42	0.21	ug/l	EPA 537 MOD
Perfluorooctanesulfonic acid	42.2	2.1	1.0	ug/l	EPA 537 MOD
6:2 Fluorotelomer sulfonate	0.257	0.10	0.083	ug/l	EPA 537 MOD




Orlando, FL

4

Sample Results

Report of Analysis

### **Report of Analysis**

Page 1 of 2

Client Sample ID: MW-4 Lab Sample ID: FA61698-1 **Date Sampled:** 02/13/19 Matrix: AQ - Ground Water **Date Received:** 02/19/19 Method: EPA 537 MOD EPA 537 MOD Percent Solids: n/a 1199048 **Project:** File ID DF **Analytical Batch** Analyzed By Prep Date **Prep Batch** Run #1 Q57888.D 02/22/19 14:15 NAF 02/20/19 09:30 OP73880 SQ1320 1 Run #2 Q57903.D 10 02/25/19 08:30 NAF 02/20/19 09:30 OP73880 SQ1321

 Initial Volume
 Final Volume

 Run #1
 260 ml
 1.0 ml

 Run #2
 260 ml
 1.0 ml

#### **PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOF	ROALKYLCARBOXYLIC AC	TIDS					
375-22-4	Perfluorobutanoic acid	0.0544	0.0077	0.0038	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0882	0.0077	0.0038	0.0019	ug/l	
307-24-4	Perfluorohexanoic acid	0.114	0.0077	0.0038	0.0019	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0286	0.0077	0.0038	0.0019	ug/l	
335-67-1	Perfluorooctanoic acid	0.0885	0.0077	0.0038	0.0019	ug/l	
375-95-1	Perfluorononanoic acid	0.00313	0.0077	0.0038	0.0019	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
307-55-1	Perfluorododecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
PERFLUOF	ROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.523 <sup>a</sup>	0.077	0.038	0.019	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.171	0.0077	0.0038	0.0019	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.887 <sup>a</sup>	0.077	0.038	0.019	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.119	0.0077	0.0038	0.0019	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.705 <sup>a</sup>	0.077	0.038	0.019	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
PERFLUOR	ROOCTANESULFONAMIDE						
754-91-6	PFOSA	0.0038 U	0.0077	0.0038	0.0019	11ø/1	
151910	1105/1	0.0050 0	0.0077	0.0050	0.0019	ug/1	
PERFLUOF	ROOCTANESULFONAMIDO	ACETIC AC	CIDS				
2355-31-9	MeFOSAA	0.015 U	0.019	0.015	0.0077	ug/l	
2991-50-6	EtFOSAA	0.015 U	0.019	0.015	0.0077	ug/l	
FLUOROTI	LOMER SILFONATES						
757124-72 4	4.2 Eluorotelomer sulfonate	0.015 U	0.019	0.015	0.0077	ug/1	
27610 07 2	6.2 Eluorotelomer sulferete	0.0150	0.019	0.015	0.0077	ug/1	
2/019-9/-2	0.2 Fluorotelomer sullonate	0.0932	0.019	0.015	0.0077	ug/1	

U = Not detected LOD = Limit of Detection LOQ = Limit of Quantitation DL = Detection L J = Indicates an estimated value

DL = Detection Limit B = Indicates analyte found in associated method blanknation range <math>N = Indicates presumptive evidence of a compound

E = Indicates value exceeds calibration range

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## **Report of Analysis**

Page 2 of 2

CAS No. C	Compound	Result	LOQ	LOD	DL	Units	0	
PFAS List								
Project:	1199048							
Method:	EPA 537 MOD E	PA 537 MOD			Perc	ent Solids:	n/a	
Matrix:	AQ - Ground Wate	r			Date	Received:	02/19/19	
Lab Sample II	<b>D:</b> FA61698-1				Date	Sampled:	02/13/19	
Client Sample	<b>ID:</b> MW-4							

CAS NO.	Compound	Result	LUQ	LOD	DL	Units	
39108-34-4	8:2 Fluorotelomer sulfonate	0.015 U	0.019	0.015	0.0077	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	Limits		
	13C2-PFHxA	88%	115%	61-13	34%		
	13C2-PFDA	113%	93%	62-12	28%		
	d5-EtFOSAA	77%	85%	57-13	35%		

(a) Result is from Run# 2

U = Not detected	LOD = Limit of Detection

 $N=\ Indicates\ presumptive\ evidence\ of\ a\ compound$ 

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

### **Report of Analysis**

Page 1 of 2

Client Sample ID: MW-3 Lab Sample ID: FA61698-2 **Date Sampled:** 02/13/19 Matrix: AQ - Ground Water **Date Received:** 02/19/19 Method: EPA 537 MOD EPA 537 MOD Percent Solids: n/a Project: 1199048 File ID DF **Analytical Batch** Analyzed By Prep Date **Prep Batch** Run #1 Q57936.D 02/27/19 14:38 NG 02/26/19 08:30 OP73950 SQ1322 1 Run #2 Q57937.D 10 02/27/19 14:53 NG 02/26/19 08:30 OP73950 SQ1322 02/27/19 15:08 NG Run #3 Q57938.D 20 OP73950 SQ1322 02/26/19 08:30 Final Volume Initial Volume

	initial volume	rinal volum
Run #1	260 ml	1.0 ml
Run #2	260 ml	1.0 ml
Run #3	260 ml	1.0 ml

**PFAS List** 

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOF	ROALKYLCARBOXYLIC AC	CIDS					
375-22-4	Perfluorobutanoic acid	0.342	0.0077	0.0038	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.464 <sup>a</sup>	0.077	0.038	0.019	ug/l	
307-24-4	Perfluorohexanoic acid	1.22 <sup>a</sup>	0.077	0.038	0.019	ug/l	
375-85-9	Perfluoroheptanoic acid	0.200	0.0077	0.0038	0.0019	ug/l	
335-67-1	Perfluorooctanoic acid	0.0588	0.0077	0.0038	0.0019	ug/l	
375-95-1	Perfluorononanoic acid	0.00319	0.0077	0.0038	0.0019	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
307-55-1	Perfluorododecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
PERFLUOF	ROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	3.51 <sup>a</sup>	0.077	0.038	0.019	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	3.05 <sup>a</sup>	0.077	0.038	0.019	ug/l	
355-46-4	Perfluorohexanesulfonic acid	6.00 <sup>b</sup>	0.15	0.077	0.038	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0152	0.0077	0.0038	0.0019	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0552	0.0077	0.0038	0.0019	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
PERFLUOF	ROOCTANESULFONAMIDE	S					
754-91-6	PFOSA	0.0038 U	0.0077	0.0038	0.0019	ug/l	
PERFLUOF	ROOCTANESULFONAMIDO	ACETIC AC	CIDS				
2355-31-9	MeFOSAA	0.015 U	0.019	0.015	0.0077	ug/l	
2991-50-6	EtFOSAA	0.015 U	0.019	0.015	0.0077	ug/l	

#### FLUOROTELOMER SULFONATES

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



## **Report of Analysis**

Page 2 of 2

Client Sample ID:	MW-3		
Lab Sample ID:	FA61698-2	Date Sampled:	02/13/19
Matrix:	AQ - Ground Water	Date Received:	02/19/19
Method:	EPA 537 MOD EPA 537 MOD	Percent Solids:	n/a
Project:	1199048		

#### **PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
757124-72-4 27619-97-2 39108-34-4	<ul><li>4:2 Fluorotelomer sulfonate</li><li>6:2 Fluorotelomer sulfonate</li><li>8:2 Fluorotelomer sulfonate</li></ul>	0.015 U 0.015 U 0.015 U	0.019 0.019 0.019	0.015 0.015 0.015	0.0077 0.0077 0.0077	ug/l ug/l ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run#	3 I	Limits	
	13C2-PFHxA 13C2-PFDA d5-EtFOSAA 13C3-HFPO-DA	81% 98% 77% 0%	105% 91% 86% 0% <sup>c</sup>	0% c 0% c 0% c		51-134% 52-128% 57-135%	

(a) Result is from Run# 2

(b) Result is from Run# 3

(c) Outside control limits due to dilution.

4.2

N = Indicates presumptive evidence of a compound

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

## **Report of Analysis**

Client Sample ID: MW-33 Lab Sample ID: FA61698-3 **Date Sampled:** 02/13/19 Matrix: AQ - Ground Water **Date Received:** 02/19/19 Method: EPA 537 MOD EPA 537 MOD Percent Solids: n/a Project: 1199048 File ID DF **Analytical Batch** Analyzed By Prep Date **Prep Batch** Run #1 Q57939.D 02/27/19 15:23 NG 02/26/19 08:30 OP73950 SQ1322 1 Run #2 Q57940.D 10 02/27/19 15:38 NG 02/26/19 08:30 OP73950 SQ1322 Run #3 Q57941.D 20 SQ1322 02/27/19 15:53 NG 02/26/19 08:30 OP73950 Final Volume Initial Volume

	initial volume	rinal volum
Run #1	250 ml	1.0 ml
Run #2	250 ml	1.0 ml
Run #3	250 ml	1.0 ml

**PFAS List** 

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUO	ROALKYLCARBOXYLIC AC	TIDS					
375-22-4	Perfluorobutanoic acid	0.349	0.0080	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.402 <sup>a</sup>	0.080	0.040	0.020	ug/l	
307-24-4	Perfluorohexanoic acid	1.06 <sup>a</sup>	0.080	0.040	0.020	ug/l	
375-85-9	Perfluoroheptanoic acid	0.204	0.0080	0.0040	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	0.0632	0.0080	0.0040	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.00321	0.0080	0.0040	0.0020	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUO	ROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	3.10 <sup>a</sup>	0.080	0.040	0.020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	2.62 <sup>a</sup>	0.080	0.040	0.020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	5.74 <sup>b</sup>	0.16	0.080	0.040	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0161	0.0080	0.0040	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0580	0.0080	0.0040	0.0020	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUO	ROOCTANESULFONAMIDE	5					
754-91-6	PFOSA	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOR	ROOCTANESULFONAMIDO	ACETIC AC	CIDS				
2355-31-9	MeFOSAA	0.016 U	0.020	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U	0.020	0.016	0.0080	ug/l	

#### FLUOROTELOMER SULFONATES

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

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## **Report of Analysis**

Page 2 of 2

Client Sample ID:	MW-33		
Lab Sample ID:	FA61698-3	Date Sampled:	02/13/19
Matrix:	AQ - Ground Water	Date Received:	02/19/19
Method:	EPA 537 MOD EPA 537 MOD	<b>Percent Solids:</b>	n/a
Project:	1199048		

#### **PFAS List**

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
757124-72-4 27619-97-2 39108-34-4	<ul><li>4:2 Fluorotelomer sulfonate</li><li>6:2 Fluorotelomer sulfonate</li><li>8:2 Fluorotelomer sulfonate</li></ul>	0.016 U 0.016 U 0.016 U	0.020 0.020 0.020	0.016 0.016 0.016	0.0080 0.0080 0.0080	ug/l ug/l ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run#	3 I	Limits	
	13C2-PFHxA 13C2-PFDA d5-EtFOSAA	79% 90% 60%	89% 71% 53% <sup>c</sup>	0% c 0% c 0% c	6 6 5	1-134% 2-128% 7-135%	

(a) Result is from Run# 2

(b) Result is from Run# 3

(c) Outside control limits due to dilution.

4.3 4

- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

J = Indicates an estimated value

## **Report of Analysis**

Page 1 of 2

Client Sample ID: EB-1 Lab Sample ID: FA61698-4 **Date Sampled:** 02/13/19 Matrix: AQ - Equipment Blank **Date Received:** 02/19/19 Method: EPA 537 MOD EPA 537 MOD Percent Solids: n/a **Project:** 1199048 File ID DF **Analytical Batch** Analyzed By Prep Date **Prep Batch** Q57887.D SQ1320 Run #1 1 02/22/19 14:01 NAF 02/20/19 09:30 OP73880 Run #2 **Initial Volume** Final Volume

Run #1 250 ml 1.0 ml Run #2

**PFAS List** 

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOI	ROALKYLCARBOXYLIC AC	CIDS					
375-22-4	Perfluorobutanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-24-4	Perfluorohexanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUO	ROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUO	ROOCTANESULFONAMIDE	<b>S</b>					
754-91-6	PFOSA	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUO	ROOCTANESULFONAMIDO	ACETIC AC	CIDS				
2355-31-9	MeFOSAA	0.016 U	0.020	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U	0.020	0.016	0.0080	ug/l	
FLUOROT	ELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	0.016 U	0.020	0.016	0.0080	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.016 U	0.020	0.016	0.0080	ug/l	

U = Not detected LOD = Limit of Detection LOQ = Limit of Quantitation DL = Detection Limit J = Indicates an estimated value

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound



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39108-34-4 8:2 Fluorotelomer sulfonate

13C2-PFHxA

13C2-PFDA

d5-EtFOSAA

**Surrogate Recoveries** 

1

CAS No.

## **Report of Analysis**

0.016

Limits

61-134%

62-128%

57-135%

0.0080 ug/l

Page 2 of 2

Client Sample	e ID: EB-1							
Lab Sample I	<b>D:</b> FA61698-4				Date	e Sampled:	02/13/19	
Matrix:	AQ - Equipment Blank Date Received:					02/19/19		
Method:	EPA 537 MOD	EPA 537 MOD			Perc	ent Solids:	n/a	
Project:	1199048							
PFAS List								
CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q	

0.016 U 0.020

Run# 2

Run# 1

101%

112%

100%

U = Not detected	LOD =	Limit of Detection
LOQ = Limit of Quantit	ation	DL = Detection Limit
E = Indicates value exce	eds calib	ration range

J = Indicates an estimated value

N = Indicates presumptive evidence of a compound

B = Indicates analyte found in associated method blank

### **Report of Analysis**

Client Sample ID: MW-1R Lab Sample ID: FA61698-5 **Date Sampled:** 02/13/19 Matrix: AQ - Ground Water **Date Received:** 02/19/19 Method: EPA 537 MOD EPA 537 MOD Percent Solids: n/a **Project:** 1199048 File ID DF **Analytical Batch** Analyzed By Prep Date **Prep Batch** Run #1 Q57891.D 1 02/22/19 15:00 NAF 02/20/19 09:30 OP73880 SQ1320 Run #2 Q57906.D 5 02/25/19 09:15 NAF 02/20/19 09:30 OP73880 SQ1321 02/25/19 09:30 NAF Run #3 50 OP73880 SQ1321 Q57907.D 02/20/19 09:30 Final Volume Initial Volume

	initial volume	rmai voium
Run #1	260 ml	1.0 ml
Run #2	260 ml	1.0 ml
Run #3	260 ml	1.0 ml

**PFAS List** 

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUO	ROALKYLCARBOXYLIC AC	TIDS					
375-22-4	Perfluorobutanoic acid	0.143	0.0077	0.0038	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	0.194	0.0077	0.0038	0.0019	ug/l	
307-24-4	Perfluorohexanoic acid	0.340	0.0077	0.0038	0.0019	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0668	0.0077	0.0038	0.0019	ug/l	
335-67-1	Perfluorooctanoic acid	0.222	0.0077	0.0038	0.0019	ug/l	
375-95-1	Perfluorononanoic acid	0.0132	0.0077	0.0038	0.0019	ug/l	
335-76-2	Perfluorodecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
307-55-1	Perfluorododecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0038 U	0.0077	0.0038	0.0019	ug/l	
PERFLUO	ROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	1.38 <sup>a</sup>	0.038	0.019	0.0096	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.599 <sup>a</sup>	0.038	0.019	0.0096	ug/l	
355-46-4	Perfluorohexanesulfonic acid	4.13 <sup>b</sup>	0.38	0.19	0.096	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.830 <sup>a</sup>	0.038	0.019	0.0096	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	16.9 <sup>b</sup>	0.38	0.19	0.096	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.019 U <sup>a</sup>	0.038	0.019	0.0096	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.019 U <sup>a</sup>	0.038	0.019	0.0096	ug/l	
PERFLUO	ROOCTANESULFONAMIDE	5					
754-91-6	PFOSA	0.0038 U	0.0077	0.0038	0.0019	ug/l	
PERFLUO	ROOCTANESULFONAMIDO	ACETIC AC	CIDS				
2355-31-9	MeFOSAA	0.015 U	0.019	0.015	0.0077	ug/l	
2991-50-6	EtFOSAA	0.015 U	0.019	0.015	0.0077	ug/l	

#### FLUOROTELOMER SULFONATES

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

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## **Report of Analysis**

Page 2 of 2

Client Sample ID:	MW-1R		
Lab Sample ID:	FA61698-5	Date Sampled:	02/13/19
Matrix:	AQ - Ground Water	Date Received:	02/19/19
Method:	EPA 537 MOD EPA 537 MOD	Percent Solids:	n/a
Project:	1199048		

#### PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
757124-72-4 27619-97-2 39108-34-4	<ul><li>4:2 Fluorotelomer sulfonate</li><li>6:2 Fluorotelomer sulfonate</li><li>8:2 Fluorotelomer sulfonate</li></ul>	0.015 U 0.202 0.015 U	0.019 0.019 0.019	0.015 0.015 0.015	0.0077 0.0077 0.0077	ug/l ug/l ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run#	3	Limits	
	13C2-PFHxA 13C2-PFDA	94% 112%	106% 91%	0% c 0% c		61-134% 62-128%	
	d5-EtFOSAA	58%	62%	0% <sup>c</sup>		57-135%	

(a) Result is from Run# 2

(b) Result is from Run# 3

(c) Outside control limits due to dilution.

N = Indicates presumptive evidence of a compound

4.5

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

## **Report of Analysis**

Client Sample ID: FIELD BLANK-1 Lab Sample ID: FA61698-6 **Date Sampled:** 02/13/19 Matrix: AQ - Field Blank Water **Date Received:** 02/19/19 Method: EPA 537 MOD EPA 537 MOD Percent Solids: n/a 1199048 **Project:** File ID DF **Analytical Batch** Analyzed By Prep Date **Prep Batch** SQ1320 Run #1 Q57886.D 1 02/22/19 13:45 NAF 02/20/19 09:30 OP73880 Run #2 Final Volume

Initial Volume Final V Run #1 250 ml 1.0 ml Run #2

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUO	ROALKYLCARBOXYLIC AC	IDS					
375-22-4	Perfluorobutanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-24-4	Perfluorohexanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUO	ROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOR	ROOCTANESULFONAMIDES	8					
754-91-6	PFOSA	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOR	ROOCTANESULFONAMIDO	ACETIC AC	CIDS				
2355-31-9	MeFOSAA	0.016 U	0.020	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U	0.020	0.016	0.0080	ug/l	
FLUOROTI	ELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	0.016 U	0.020	0.016	0.0080	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.016 U	0.020	0.016	0.0080	ug/l	

U = Not detected LOD = Limit of Detection LOQ = Limit of Quantitation DL = Detection L J = Indicates an estimated value

DL = Detection Limit B = Indicates analyte found in associated method blank

- E = Indicates value exceeds calibration range
- N = Indicates presumptive evidence of a compound
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FA61698

4.6

# **Report of Analysis**

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PFAS List			
Project:	1199048		
Method:	EPA 537 MOD EPA 537 MOD	Percent Solids:	n/a
Matrix:	AQ - Field Blank Water	Date Received:	02/19/19
Lab Sample ID:	FA61698-6	Date Sampled:	02/13/19
Client Sample ID:	FIELD BLANK-1		
Client Comule ID.	EIELD DLANK 1		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.016 U	0.020	0.016	0.0080	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limi	ts		
	13C2-PFHxA	100%		61-13	34%		
	13C2-PFDA	101%		62-12	28%		
	d5-EtFOSAA	92%		57-13	35%		

U = Not detected	LOD =	Limit o	of Detection
LOQ = Limit of Quantit	ation	DL =	Detection Limit
E = Indicates value exce	eds calib	ration 1	ange

J = Indicates an estimated value

 $N = \ Indicates \ presumptive \ evidence \ of \ a \ compound$ 

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B = Indicates analyte found in associated method blank

### **Report of Analysis**

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Client Sample ID: MW-2 Lab Sample ID: FA61698-7 **Date Sampled:** 02/13/19 Matrix: AQ - Ground Water **Date Received:** 02/19/19 Method: EPA 537 MOD EPA 537 MOD Percent Solids: n/a **Project:** 1199048 File ID **Analytical Batch** DF Analyzed By Prep Date **Prep Batch** Run #1 Q57908.D 5 02/25/19 09:44 NAF 02/20/19 09:30 OP73880 SQ1321 Run #2 Q57909.D 50 02/20/19 09:30 OP73880 SQ1321 02/25/19 09:59 NAF Run #3 Q57910.D 250 OP73880 SQ1321 02/25/19 10:23 NAF 02/20/19 09:30 Initial Val Final Valu

	Initial Volume	Final Volume
Run #1	240 ml	1.0 ml
Run #2	240 ml	1.0 ml
Run #3	240 ml	1.0 ml

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOI	ROALKYLCARBOXYLIC AC	CIDS					
375-22-4	Perfluorobutanoic acid	0.467	0.042	0.021	0.010	ug/l	
2706-90-3	Perfluoropentanoic acid	0.566	0.042	0.021	0.010	ug/l	
307-24-4	Perfluorohexanoic acid	1.88	0.042	0.021	0.010	ug/l	
375-85-9	Perfluoroheptanoic acid	0.396	0.042	0.021	0.010	ug/l	
335-67-1	Perfluorooctanoic acid	0.853	0.042	0.021	0.010	ug/l	
375-95-1	Perfluorononanoic acid	0.0261	0.042	0.021	0.010	ug/l	J
335-76-2	Perfluorodecanoic acid	0.021 U	0.042	0.021	0.010	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.021 U	0.042	0.021	0.010	ug/l	
307-55-1	Perfluorododecanoic acid	0.021 U	0.042	0.021	0.010	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.021 U	0.042	0.021	0.010	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.021 U	0.042	0.021	0.010	ug/l	
PERFLUO	ROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	5.02 <sup>a</sup>	0.42	0.21	0.10	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	3.89 <sup>a</sup>	0.42	0.21	0.10	ug/l	
355-46-4	Perfluorohexanesulfonic acid	19.0 <sup>b</sup>	2.1	1.0	0.52	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	2.15 <sup>a</sup>	0.42	0.21	0.10	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	42.2 <sup>b</sup>	2.1	1.0	0.52	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.21 U <sup>a</sup>	0.42	0.21	0.10	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.21 U <sup>a</sup>	0.42	0.21	0.10	ug/l	
PERFLUOI	ROOCTANESULFONAMIDE	8					
754-91-6	PFOSA	0.021 U	0.042	0.021	0.010	ug/l	
PERFLUOI	ROOCTANESULFONAMIDO	ACETIC AC	CIDS				
2355-31-9	MeFOSAA	0.083 U	0.10	0.083	0.042	ug/l	
2991-50-6	EtFOSAA	0.083 U	0.10	0.083	0.042	ug/l	
						2	

#### FLUOROTELOMER SULFONATES

U = Not detected LOD = Limit of Detection LOQ = Limit of Quantitation

J = Indicates an estimated value

DL = Detection Limit B = Indicates analyte found in associated method blank E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## **Report of Analysis**

Page 2 of 2

Client Sample ID:	MW-2		
Lab Sample ID:	FA61698-7	Date Sampled:	02/13/19
Matrix:	AQ - Ground Water	Date Received:	02/19/19
Method:	EPA 537 MOD EPA 537 MOD	Percent Solids:	n/a
Project:	1199048		

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
757124-72-4 27619-97-2 39108-34-4	<ul><li>4:2 Fluorotelomer sulfonate</li><li>6:2 Fluorotelomer sulfonate</li><li>8:2 Fluorotelomer sulfonate</li></ul>	0.083 U 0.257 0.083 U	0.10 0.10 0.10	0.083 0.083 0.083	0.042 0.042 0.042	ug/l ug/l ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run#	3	Limits	
	13C2-PFHxA 13C2-PFDA d5-EtFOSAA	110% 113% 64%	0% c 0% c 0% c	0% c 0% c 0% c		61-134% 62-128% 57-135%	

(a) Result is from Run# 2

(b) Result is from Run# 3

(c) Outside control limits due to dilution.

- B = Indicates analyte found in associated method blank
- N = Indicates presumptive evidence of a compound

J = Indicates an estimated value





Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

• Chain of Custody

5



#### SGS North America Inc. CHAIN OF CUSTODY RECORD



Locations Nationwide Florida Alaska Colorado. New Jersey Texes North Carolina Virginia Louisiana

JENT: So ITACT: Julie Shum OJECT 119904 AME: 119904	GS North Ame nway 48	erica Inc Alauk PHONE NO: PWSID#:	a Division (907) 56	0-0343	SGS Addit	Refere	nce:		- 1	SGS	Orla	ndo, Fl		-
ITACT: Julie Shun OJECT 119904 AME: 119904	nway 48	PHONE NO: PWSID#:	(907) 56	9.9343	Addit	ional Co								
OJECT 119904	48	PWSID#:			reque	sted.	omments		l solls r	eport ou	t in dr	y weight unless	otherwise	Page 1 of 1
AME:	40				1	Preserv-						_	a di di seconda d	
		NPDL#:	DL#:		0	Uaed:	NOCE	-		-				
ORTS TO:		E-MAIL:	Julie.Shumwa	ay@sgs.com	NT	TYPE C = COMP								
DICE TO:	QUOTE #:			1	GRAN	ass ass								
SGS - Alaska		P.O. #:	1199	048	N E	Multi	E PF							
SAMPLE IDENT	TIFICATION	DATE mm/dd/vv	TIME	MATRIX/	R	Suite	AFCE			MS	MSD	SGS lab #	Los	ation ID
L MW-4	4	2/13/2019	11:57	Water	2	G =	X		-			1199048001		
Z MW-S	3	2/13/2019	13:04	Water	2	G =	X				1	1199048002		
3 MW-3	33	2/13/2019	13:06	Water	2	G =	X				1	1199048003		
Y EB-1	1	2/13/2019	13:40	Water	2	G =	X		-		-	1199048004		
5 MW-1	R	2/13/2019	14:34	Water	2	G =	X	-		1		1199048005		
Field Bla	ank-1	2/13/2019	14:00	Water	2	G =	X			11	1	1199048006		
7 MW-3	2	2/13/2019	15:26	Water	2	G =	x				-	1199048007	1	
			-	-		1	1	-				1		
nquished By: (1)	1	Date	Time	Received B	y:				DC	OD Project	2	NO	Data Deliverabl	e Requirements:
111		alala	1017	110	2				Report	to DL (J F	lags)?	NO	-	
1 Munaa	4	418/19	1	UT	1	-		-	Report	as DL/LOD	/LUU?	YES	Louis	WEGE EDD
nguished By: (2)	/	Date	Time	Heceived B	y:			ľ	Looler ID	Reque	sted Tu	maround Time and	d-or Special Inst	ructions:
Vr2					_			_			Dec	and in us/ Delet	CREEZE EACERDED	1
nquished By: (3)		Date	Time	Received B	lý:			1		-	Hel	ion in ug/L. Helen	T THE PASOSOL	
		( in the second	_					-	Temp Bla	ank °C:	5.1		Chain of Cu	stody Seal: (Circle
nquished By: (4)		Date	Time	Received	or Labo	pratory B	r z/  93	3		or	Ambien	en -	INTACT B	ROKEN ABSEN
200 W. Potter Drive Ancho	rage, AK 9951	18 Tel: (907) 562	2-2343 Fax: (9	07) 561-5301			12	1	http://ww	W.545.CO	n/terms	and conditions.	htm	

VIEWED NY

F088\_COC\_REF\_LA8\_20181120.xls

FA61698: Chain of Custody Page 1 of 2





### SGS Sample Receipt Summary

Job Number: FA61698 Clien		Client:	nt: SGS ALASKA		Project: 1199048				
Date / Time Received: 2/19/2019 9:30:00 AM			Delivery Method: UPS		Airbill #'s: 1za8619w0167306275				
Therm ID: IR 1;			Therm CF: -0.2; # of Cool						
Cooler Temps (Raw Measure	ed) °C: Cool	er 1: (3.3	);						
Cooler Temps (Correcte	ed) °C: Cool	er 1: (3.1	);						
Cooler Information	<u>Y or</u>	N		Sample Information		Y	or	N	N/A
1. Custody Seals Present				1. Sample labels present	on bottles				
2. Custody Seals Intact	$\checkmark$			2. Samples preserved pr	operly				
3. Temp criteria achieved				<ol> <li>Sufficient volume/cont</li> </ol>	ainers recvd for analysis:			Π	
4. Cooler temp verification	IR Gun			4. Condition of sample		Intac	t		
5. Cooler media	Ice (Bag)			5. Sample recvd within H	IT	$\checkmark$			
				6. Dates/Times/IDs on C	OC match Sample Label	✓			
rip Blank Information	<u>Y</u> or	<u>N</u>	N/A	7. VOCs have headspace	e				$\checkmark$
1. Trip Blank present / cooler				8. Bottles received for un	specified tests				
2. Trip Blank listed on COC				9. Compositing instructio	ns clear				$\checkmark$
	Wor	e	N/A	10. Voa Soil Kits/Jars rec	ceived past 48hrs?				$\checkmark$
		<u> </u>		11. % Solids Jar received	d?				$\checkmark$
3. Type Of TB Received				12. Residual Chlorine Pro	esent?				$\checkmark$
Misc. Information									
Number of Encores: 25-Grar	m	5-Gram	Numl	ber of 5035 Field Kits:	Number of La	ab Filter	ed Me	tals:	
Test Strip Lot #s:	рН 0-3	230315	5рН	10-12 <u>219813A</u>	Other: (Spec	cify)			
Residual Chlorine Test Strip Lo	ot #:								
Comments									
SM001 Technicia	in: PETERH		Date: 2/19/2019	9:30:00 AM	Reviewer:		[	Date:	
Rev. Date 03/24/17							-	-	

FA61698: Chain of Custody Page 2 of 2





MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

• 7



# **Method Blank Summary**

Job Number:	FA61698
Account:	SGSAKA SGS North America, Inc
Project:	1199048

Sample OP73880-MB	<b>File ID</b> Q57879.D	<b>DF</b> 1	<b>Analyzed</b> 02/22/19	<b>By</b> NAF	<b>Prep Date</b> 02/20/19	Prep Batch OP73880	<b>Analytical Batch</b> SQ1320

#### The QC reported here applies to the following samples:

Method: EPA 537 MOD

5 EAGLOOP 6 EAGLOOP 7

Limits

FA61698-1, FA61698-4, FA61698-5, FA61698-6, FA61698-7

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.0020	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0080	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0080	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0080	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0080	0.0020	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0020	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0080	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0080	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0080	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0080	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0080	0.0020	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0080	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0080	0.0020	ug/l	
754-91-6	PFOSA	ND	0.0080	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0080	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0080	ug/l	
757124-72-4	44:2 Fluorotelomer sulfonate	ND	0.020	0.0080	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.020	0.0080	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.020	0.0080	ug/l	

#### CAS No. Surrogate Recoveries

13C2-PFHxA	115%	61-134%
13C2-PFDA	113%	62-128%
d5-EtFOSAA	105%	57-135%

6.1.1

FA61698

# **Method Blank Summary**

Job Number:	FA61698
Account:	SGSAKA SGS North America, Inc
Project:	1199048

Sample OP73950-MB	<b>File ID</b> Q57935.D	<b>DF</b> 1	<b>Analyzed</b> 02/27/19	<b>By</b> NG	<b>Prep Date</b> 02/26/19	Prep Batch OP73950	<b>Analytical Batch</b> SQ1322

#### The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA61698-2, FA61698-3

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0077	0.0019	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0077	0.0019	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0077	0.0019	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0077	0.0019	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0077	0.0019	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0077	0.0019	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0077	0.0019	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0077	0.0019	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0077	0.0019	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0077	0.0019	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0077	0.0019	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0077	0.0019	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0077	0.0019	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0077	0.0019	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0077	0.0019	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0077	0.0019	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0077	0.0019	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0077	0.0019	ug/l	
754-91-6	PFOSA	ND	0.0077	0.0019	ug/l	
2355-31-9	MeFOSAA	ND	0.019	0.0077	ug/l	
2991-50-6	EtFOSAA	ND	0.019	0.0077	ug/l	
757124-72-4	44:2 Fluorotelomer sulfonate	ND	0.019	0.0077	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.019	0.0077	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.019	0.0077	ug/l	

#### CAS No. Surrogate Recoveries

13C2-PFHxA	117%	61-134%
13C2-PFDA	112%	62-128%
d5-EtFOSAA	102%	57-135%
13C3-HFPO-DA	0%*	60-140%

Limits

6.1.2

FA61698

# **Blank Spike Summary**

Job Number:	FA61698
Account:	SGSAKA SGS North America, Inc
Project:	1199048

Sample OP73880-BS	<b>File ID</b> Q57878.D	<b>DF</b> 1	<b>Analyzed</b> 02/22/19	<b>By</b> NAF	<b>Prep Date</b> 02/20/19	Prep Batch OP73880	<b>Analytical Batch</b> SQ1320
							-

### The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA61698-1, FA61698-4, FA61698-5, FA61698-6, FA61698-7

		Spike	BSP	BSP	
CAS No.	Compound	ug/l	ug/l	%	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0900	113	20-120
2706-90-3	Perfluoropentanoic acid	0.08	0.0864	108	40-131
307-24-4	Perfluorohexanoic acid	0.08	0.0832	104	63-146
375-85-9	Perfluoroheptanoic acid	0.08	0.0871	109	71-138
335-67-1	Perfluorooctanoic acid	0.08	0.0833	104	74-137
375-95-1	Perfluorononanoic acid	0.08	0.0871	109	76-140
335-76-2	Perfluorodecanoic acid	0.08	0.0844	106	65-148
2058-94-8	Perfluoroundecanoic acid	0.08	0.0751	94	57-138
307-55-1	Perfluorododecanoic acid	0.08	0.0630	79	58-118
72629-94-8	Perfluorotridecanoic acid	0.08	0.0644	81	52-120
376-06-7	Perfluorotetradecanoic acid	0.08	0.0615	77	49-122
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0875	109	73-148
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0924	116	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0819	102	74-142
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0860	108	74-123
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0792	99	70-134
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0837	105	70-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0661	83	56-127
754-91-6	PFOSA	0.08	0.0820	103	40-142
2355-31-9	MeFOSAA	0.08	0.0760	95	57-128
2991-50-6	EtFOSAA	0.08	0.0741	93	55-135
757124-72-4	14:2 Fluorotelomer sulfonate	0.08	0.0879	110	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0908	114	70-153
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0830	104	61-154

CAS No.	Surrogate Recoveries	BSP	Limits
	13C2-PFHxA	114%	61-134%
	d5-EtFOSAA	109% 100%	62-128% 57-135%

Page 1 of 1

6.2.1

FA61698

\* = Outside of Control Limits.

# **Blank Spike Summary**

Job Number:	FA61698
Account:	SGSAKA SGS North America, Inc
Project:	1199048

Sample OP73950-BS <sup>a</sup>	<b>File ID</b> Q57934.D	<b>DF</b> 1	<b>Analyzed</b> 02/27/19	<b>By</b> NG	<b>Prep Date</b> 02/26/19	Prep Batch OP73950	Analytical Batch SQ1322

#### The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA61698-2, FA61698-3

		Spike	BSP	BSP	
CAS No.	Compound	ug/l	ug/l	%	Limits
375-22-4	Perfluorobutanoic acid	0.0769	0.0831	108	20-120
2706-90-3	Perfluoropentanoic acid	0.0769	0.0805	105	40-131
307-24-4	Perfluorohexanoic acid	0.0769	0.0769	100	63-146
375-85-9	Perfluoroheptanoic acid	0.0769	0.0848	110	71-138
335-67-1	Perfluorooctanoic acid	0.0769	0.0785	102	74-137
375-95-1	Perfluorononanoic acid	0.0769	0.0849	110	76-140
335-76-2	Perfluorodecanoic acid	0.0769	0.0790	103	65-148
2058-94-8	Perfluoroundecanoic acid	0.0769	0.0734	95	57-138
307-55-1	Perfluorododecanoic acid	0.0769	0.0629	82	58-118
72629-94-8	Perfluorotridecanoic acid	0.0769	0.0656	85	52-120
376-06-7	Perfluorotetradecanoic acid	0.0769	0.0626	81	49-122
375-73-5	Perfluorobutanesulfonic acid	0.0769	0.0821	107	73-148
2706-91-4	Perfluoropentanesulfonic acid	0.0769	0.0807	105	70-130
355-46-4	Perfluorohexanesulfonic acid	0.0769	0.0783	102	74-142
375-92-8	Perfluoroheptanesulfonic acid	0.0769	0.0847	110	74-123
1763-23-1	Perfluorooctanesulfonic acid	0.0769	0.0732	95	70-134
68259-12-1	Perfluorononanesulfonic acid	0.0769	0.0713	93	70-130
335-77-3	Perfluorodecanesulfonic acid	0.0769	0.0608	79	56-127
754-91-6	PFOSA	0.0769	0.0731	95	40-142
2355-31-9	MeFOSAA	0.0769	0.0753	98	57-128
2991-50-6	EtFOSAA	0.0769	0.0715	93	55-135
757124-72-4	14:2 Fluorotelomer sulfonate	0.0769	0.0871	113	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.0769	0.0864	112	70-153
39108-34-4	8:2 Fluorotelomer sulfonate	0.0769	0.0819	106	61-154

CAS No.	Surrogate Recoveries	BSP	Limits		
	13C2-PFHxA	120%	61-134%		
	13C2-PFDA	118%	62-128%		
	d5-EtFOSAA	110%	57-135%		
	13C3-HFPO-DA	0%*	60-140%		

(a) Insufficient sample for MS/MSD.

\* = Outside of Control Limits.

6.2.2

## Matrix Spike Summary

I

Job Number:	FA61698
Account:	SGSAKA SGS North America, Inc
Project:	1199048

Sample	File ID	DF	Analyzed	By	Prep Date	<b>Prep Batch</b>	Analytical Batch
OP73880-MS	Q57920.D	200	02/25/19	NAF	02/20/19	OP73880	SQ1321
FA61695-1 <sup>a</sup>	Q57915.D	100	02/25/19	NAF	02/20/19	OP73880	SQ1321
FA61695-1 <sup>a</sup>	Q57919.D	200	02/25/19	NAF	02/20/19	OP73880	SQ1321
FA61695-1 <sup>a</sup>	Q57919.D	200	02/25/19	NAF	02/20/19	OP73880	SQ1321

#### The QC reported here applies to the following samples:

FA61698-1, FA61698-4, FA61698-5, FA61698-6, FA61698-7

		FA61695-1		Spike MS		S MS			
CAS No.	Compound	ug/l	Q	ug/l	ug/	1	%	Limits	
375-22-4	Perfluorobutanoic acid	1.5 U		0.154	ND	)	0*	20-120	
2706-90-3	Perfluoropentanoic acid	3.1 U <sup>b</sup>		0.154	ND	)	0*	40-131	
307-24-4	Perfluorohexanoic acid	1.5 U		0.154	ND	)	0*	63-146	
375-85-9	Perfluoroheptanoic acid	1.5 U		0.154	ND	)	0*	71-138	
335-67-1	Perfluorooctanoic acid	1.5 U		0.154	ND	)	0*	74-137	
375-95-1	Perfluorononanoic acid	1.5 U		0.154	ND	)	0*	76-140	
335-76-2	Perfluorodecanoic acid	1.5 U		0.154	ND	)	0*	65-148	
2058-94-8	Perfluoroundecanoic acid	1.5 U		0.154	ND	)	0*	57-138	
307-55-1	Perfluorododecanoic acid	1.5 U		0.154	ND	)	0*	58-118	
72629-94-8	Perfluorotridecanoic acid	1.5 U		0.154	ND	)	0*	52-120	
376-06-7	Perfluorotetradecanoic acid	1.5 U		0.154	ND	)	0*	49-122	
375-73-5	Perfluorobutanesulfonic acid	1.5 U		0.154	ND	)	0*	73-148	
2706-91-4	Perfluoropentanesulfonic acid	3.1 U <sup>b</sup>		0.154	ND	)	0*	70-130	
355-46-4	Perfluorohexanesulfonic acid	1.5 U		0.154	ND	)	0*	74-142	
375-92-8	Perfluoroheptanesulfonic acid	1.5 U		0.154	ND	)	0*	74-123	
1763-23-1	Perfluorooctanesulfonic acid	1.5 U		0.154	ND	)	0*	70-134	
68259-12-1	Perfluorononanesulfonic acid	1.5 U		0.154	ND	)	0*	70-130	
335-77-3	Perfluorodecanesulfonic acid	1.5 U		0.154	ND	)	0*	56-127	
754-91-6	PFOSA	1.5 U		0.154	ND	)	0*	40-142	
2355-31-9	MeFOSAA	3.8 U		0.154	ND	)	0*	57-128	
2991-50-6	EtFOSAA	3.8 U		0.154	ND	)	0*	55-135	
757124-72-4	14:2 Fluorotelomer sulfonate	3.8 U		0.154	ND	)	0*	70-130	
27619-97-2	6:2 Fluorotelomer sulfonate	3.8 U		0.154	ND	)	0*	70-153	
39108-34-4	8:2 Fluorotelomer sulfonate	3.8 U		0.154	ND	)	0*	61-154	
CAS No.	Surrogate Recoveries	MS		FA6169	5-1	FA6	1695-1	Limits	
	13C2-PFHxA	0%* c		0%* <sup>c</sup>		0%*	c	61-134%	
	13C2-PFDA	0%* c		0%* c		0%*	с	62-128%	
	d5-EtFOSAA	0%* c		0%* c		0%*	с	57-135%	

(a) Dilution required due to matrix interference (internal standard failure).

(b) Result is from Run #2.

(c) Outside control limits due to dilution.

Method: EPA 537 MOD

6.3.1

<sup>\* =</sup> Outside of Control Limits.

# **Duplicate Summary**

Job Number:	FA61698
Account:	SGSAKA SGS North America, Inc
Project:	1199048

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP73880-DUP	Q57918.D	100	02/25/19	NAF	02/20/19	OP73880	SQ1321
FA61697-1 <sup>a</sup>	Q57917.D	100	02/25/19	NAF	02/20/19	OP73880	SQ1321

#### The QC reported here applies to the following samples:

Method: EPA 537 MOD

6.4.1 6

FA61698-1, FA61698-4, FA61698-5, FA61698-6, FA61698-7

		FA61697	-1	DUP		
CAS No.	Compound	ug/l	Q	ug/l Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	1.5 U		ND	nc	30
2706-90-3	Perfluoropentanoic acid	1.5 U		ND	nc	30
307-24-4	Perfluorohexanoic acid	1.5 U		ND	nc	30
375-85-9	Perfluoroheptanoic acid	1.5 U		ND	nc	30
335-67-1	Perfluorooctanoic acid	1.5 U		ND	nc	30
375-95-1	Perfluorononanoic acid	1.5 U		ND	nc	30
335-76-2	Perfluorodecanoic acid	1.5 U		ND	nc	30
2058-94-8	Perfluoroundecanoic acid	1.5 U		ND	nc	30
307-55-1	Perfluorododecanoic acid	1.5 U		ND	nc	30
72629-94-8	Perfluorotridecanoic acid	1.5 U		ND	nc	30
376-06-7	Perfluorotetradecanoic acid	1.5 U		ND	nc	30
375-73-5	Perfluorobutanesulfonic acid	1.5 U		ND	nc	30
2706-91-4	Perfluoropentanesulfonic acid	1.5 U		ND	nc	30
355-46-4	Perfluorohexanesulfonic acid	1.5 U		ND	nc	30
375-92-8	Perfluoroheptanesulfonic acid	1.5 U		ND	nc	30
1763-23-1	Perfluorooctanesulfonic acid	1.5 U		ND	nc	30
68259-12-1	9-12-1 Perfluorononanesulfonic acid			ND	nc	30
335-77-3	Perfluorodecanesulfonic acid	1.5 U		ND	nc	30
754-91-6	PFOSA	1.5 U		ND	nc	30
2355-31-9	MeFOSAA	3.8 U		ND	nc	30
2991-50-6	EtFOSAA	3.8 U		ND	nc	30
757124-72-4	44:2 Fluorotelomer sulfonate	3.8 U		ND	nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	3.8 U		ND	nc	30
39108-34-4	8:2 Fluorotelomer sulfonate	3.8 U		ND	nc	30
CAS No.	Surrogate Recoveries	DUP		FA61697-1	Limits	
	13C2-PFHxA	0%* <sup>b</sup>		0%* <sup>b</sup>	61-134	%
	13C2-PFDA	0%* b		0%* <sup>b</sup>	62-128	%
	d5-EtFOSAA	0%* <sup>b</sup>		0%* <sup>b</sup>	57-135	%

(a) Dilution required due to matrix interference (internal standard failure).

(b) Outside control limits due to dilution.



FA61698

<sup>\* =</sup> Outside of Control Limits.

#### Laboratory Data Review Checklist

## Completed By:

Scott Hummel

Title:

Chemist

Date:

March 14, 2019

CS Report Name:

2019 GW Napa Van Horn [Onsite MWs]

Report Date:

March 6, 2019

Consultant Firm:

NORTECH, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1199048

ADEC File Number:

100.38.242

Hazard Identification Number:

25865

#### 1199048

#### 1. Laboratory

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

• Yes O No 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 O No Comments: Samples were submitted for perfluorinated compounds (PFCs) and were transferred to, and analyzed by, SGS-Orlando. Samples were hand-delivered to SGS North Amercia, Inc., in Fairbanks, Alaska. 2. Chain of Custody (CoC) a. CoC information completed, signed, and dated (including released/received by)? • Yes O No Comments: An additional COC was prepared by SGS for the sample transfer, and that was completed correctly. b. Correct Analyses requested? • Yes O No Comments: 3. Laboratory Sample Receipt Documentation a. Sample/cooler temperature documented and within range at receipt ( $0^{\circ}$  to  $6^{\circ}$  C)?

• Yes O No Comments:

The three sample receipt forms confirm samples met integrity QC from field to analytical laboratory.

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

● Yes ○ No Comme	nts:
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PFC analysis only requires temperature preservation.

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

● Yes ○ No Comments:

Sample containers were noted to be received in good condition.

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

○ Yes ● No Comments:

No discrepancies were noted or documented by the laboratory.

e. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

4. Case Narrative

a. Present and understandable?

• Yes O No Comments:

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

• Yes O No Comments:

The case narrative for SGS-Orlando is extensive, noting that quality control performance was met for this work order except were detailed in the case narrative.

The case narrative stated that surrogate recoveries are outside of control limits due to dilution for MW-1R, MW-2, MW-3, and MW-33 (dup). The matrix spike had recoveries outside of laboratory control limits, and the parent sample was not analyzed from project samples associated with this work order.

c. Were all corrective actions documented?

○ Yes ● No Comments:

No corrective actions were necessary.

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

Comments:

The case narrative does not identify any effect upon data quality or usability.

#### 5. <u>Samples Results</u>

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

● Yes ○ No Comments:

#### 1199048

b. All applicable holding times met?

• Yes O No Comments:

- c. All soils reported on a dry weight basis?
  - Yes No Comments:

There were no soil samples submitted in this work order.

- d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?
  - Yes No Comments:

For target analytes of concern at this site the LOQ is impacted by dilution factor, analytical sensitivity can be used to evaluate concentrations for this project.

e. Data quality or usability affected?

○ Yes ● No Comments:

Data quality or usability are not affected.

6. QC Samples

- a. Method Blank
  - i. One method blank reported per matrix, analysis and 20 samples?
  - Yes No Comments:

An additional blank sample was prepared in the field using laboratory supplied "PFC-free water." This sample is identified as *Field Blank-1* for this work order.

- ii. All method blank results less than limit of quantitation (LOQ)?
- Yes O No Comments:

Method Blanks associated with this work order were reported as non-detect.

iii. If above LOQ, what samples are affected?

Comments:

No samples are affected.

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

○ Yes ● No Comments:

There are no affected samples, no data flags are required.

v. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

- b. Laboratory Control Sample/Duplicate (LCS/LCSD)
  - i. Organics One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
  - Yes O No Comments:

An LCS was reported for each batch associated with this work order.

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

○ Yes ● No Comments:

No metals or inorganic analyses requested in this work order.

- 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 O No Comments:

LCS recovery meets data quality objectives.

 iv. Precision – All relative percent differences (RPD) 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 Comments:

There is no LCSD reported with this work order. MS/MSD %R and RPD did not meet control limits due to sample dilution and matrix interference.

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

Comments:

Reported %R for LCS samples meet acceptable limits for laboratory prepared quality control samples. No samples are affected.

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

○ Yes <sup>③</sup> No <sup>(</sup>

Comments:

No data flags are required.

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

Comments:

Data quality or usability are not affected.

- c. Surrogates Organics Only
  - i. Are surrogate recoveries reported for organic analyses field, QC and laboratory samples?
  - Yes O No 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

Comments:

PFC analysis for samples: *MW-1R*, *MW-2*, *MW-3*, and *MW-33* have reported surrogate recoveries outside of laboratory criteria due to sample dilution.

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

● Yes ○ No Comment
--------------------

iv. Data quality or usability affected?

Comments:

Sample dilution does not affect data quality or usability. Samples which required dilution exceed the current EPA Human Health Advisory Lifetime Limits.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil
  - i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?
    - (If not, enter explanation below.)
  - Yes No Comments:

No trip blank was required for these analytical methods.

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

Comments:

N/A; no trip blank is necessary.

iii. All r	esults less than LOQ?	
○ Yes	• No	Comments:
N/A; see above		
iv. If ab	ove LOQ, what samples	are affected?
		Comments:
No samples are	affected, a trip blank wa	as not required.
v. Data	quality or usability affe	cted?
		Comments:
Data quality or	usability are not affected	ł.
e. Field Duplie	cate	
i. One	field duplicate submittee	d per matrix, analysis and 10 project samples?
• Yes	○ No	Comments:
ii. Subr	nitted blind to lab?	
• Yes	○ No	Comments:
Replicate samp	le pair <i>MW-3/MW-33</i> wa	as submitted in this work order.
iii. Prec (Rec	ision – All relative perce commended: 30% water, RPD (%) = Absolu	ent differences (RPD) less than specified DQOs? 50% soil) te value of: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$
	Where	$R_1$ = Sample Concentration $R_2$ = Field Duplicate Concentration
• Yes	○ No	Comments:
Laboratory resu calculable.	ilts for the duplicate pair	identified above meet reproducibility standards, where

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

Comments:

### 1199048

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

• Yes • No • Not Applicable

Sample *EB-1* was submitted in this work order.

i. All results less than LOQ?

● Yes ○ No Comments:

ii. If above LOQ, what samples are affected?

Comments:

No samples are affected, equipment blank results were non-detect.

iii. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

- 7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
  - a. Defined and appropriate?

○ Yes ● No

Comments:

There are no additional data flags or qualifiers not identified in the laboratory reports.