Summary Report February to May 2016 Private Well Sampling City of Fairbanks Regional Fire Training Center Fairbanks, Alaska

August 2016



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SUMMARY REPORT FEBRUARY TO MAY 2016 PRIVATE WELL SAMPLING CITY OF FAIRBANKS REGIONAL FIRE TRAINING CENTER FAIRBANKS, ALASKA

August 10, 2016

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADOT&PF	Alaska Department of Transportation & Public Facilities
AFFF	aqueous film-forming foam
Ahtna	Ahtna Engineering Services, LLC
bgs	below ground surface
°Ċ	degrees Celsius
COC	chain of custody
CoF	City of Fairbanks
DNR	Alaska Department of Natural Resources
EPA	U.S. Environmental Protection Agency
FNSB	Fairbanks North Star Borough
FYSA	Fairbanks Youth Soccer Association
GAC	granular activated carbon
IGSA	Interior Girls Softball Association
LHA	Lifetime Health Advisory
μg/L	microgram per liter
MW	monitoring well
ng/L	nanogram per liter
PAN	parcel account number
PFC	perfluorinated compound
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PHA	Provisional Health Advisory
QA	quality assurance
QC	quality control
RFTC	Regional Fire Training Center
TestAmerica	TestAmerica Laboratories, Inc.
TOC	top of casing
UCMR	EPA Unregulated Contaminant Monitoring Rule
WO	work order
YSI	multiprobe water quality meter

Summary Report February to May 2016 Private Well Sampling City of Fairbanks Regional Fire Training Center Fairbanks, Alaska

1.0 INTRODUCTION

Shannon & Wilson, Inc. has prepared this report to document our well search and private well sampling effort proximal to the Regional Fire Training Center (RFTC) at 1710 30th Avenue in Fairbanks, Alaska. The City of Fairbanks (CoF) owns the land and facility and leases space at the facility to the State of Alaska and other entities. The objective of the well search and sampling was to identify private wells and determine whether the subset of wells that we sampled have been affected by groundwater contamination associated with the burn pit at the RFTC. The RFTC burn pit is considered an active ADEC contaminated site, File Number 102.38.182.

This report was prepared for the City of Fairbanks in accordance with the terms and conditions of our City of Fairbanks Regional Fire Training Center Burn Pit Site Investigation services contract (Project No. FB-14-25), relevant Alaska Department of Environmental Conservation (ADEC) guidance documents, and 18 Alaska Administrative Code (AAC) 75.335. The tasks described herein were conducted as authorized by our Professional Services Contract and in response to proposal numbers 31-2-16864-004, -005, and -006.

1.1 Background

The CoF RFTC burn pit, or "combustible liquids pit," was constructed in 1984 and used for firefighting exercises for approximately 20 years. Fire-fighting agents used during training in the CoF burn pit include water, protein-based foam, and aqueous film-forming foam (AFFF). AFFF has since been found to contain perfluorinated compounds (PFCs), a category of persistent organic compounds that are considered emerging contaminants. Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are PFCs commonly found at sites where AFFFs were used. Due to their persistence, toxicity, and bioaccumulative potential, these compounds are of increasing concern to environmental and health agencies.

In our 2015 Phase 2 site investigation we sampled five soil borings and five temporary well points around the RTFC burn pit. Concentrations of PFOS and PFOA in onsite water samples exceeded ADEC-proposed groundwater-cleanup levels and other regulatory levels. Concentrations of PFCs in groundwater samples collected from around the burn pit were up to an estimated 550,000 nanograms per liter (ng/L) PFOS and 7,800 ng/L PFOA.

¹⁷³⁵ Offsite Quarterly RFTC Report.docx

On September 1, 2015, ADEC representatives requested that offsite wells be sampled to determine if PFC contamination was present. In November 2015, we collected water samples from a Alaska Department of Transportation & Public Faculties (ADOT&PF) monitoring well (MW) on Davis Road (MW-507) and a Fairbanks North Star Borough (FNSB) irrigation well at the Interior Girls Softball Association (IGSA) softball fields, 0.2 miles and 0.8 miles northwest of the RFTC, respectively. PFCs were detected in samples from both offsite wells but concentrations were generally greater in MW-507. PFOS was detected at up to 63 ng/L and PFOA at up to 21 ng/L in the MW-507 sample and field duplicate sample.

The ratios of individual PFC concentration magnitudes in the offsite groundwater samples are similar to those in the onsite groundwater samples. Therefore, our December 2015 report concluded that the two data sets are reasonably inferred to be associated with a common source. We recommended a search for private water-supply wells within a half mile of the RFTC to determine if offsite exposure to PFCs exceeds health-based screening levels.

The topography in the RFTC area is generally flat; the site slopes gently to the north. The depth to groundwater at the time of onsite sampling ranged from approximately 7 feet to 8 feet below ground surface (bgs). Based on our experience and knowledge of hydrogeology in the Fairbanks area, the horizontal gradient in this area is relatively flat, typically averaging one foot to two feet per 1,000 feet. The groundwater-flow direction fluctuates seasonally and is dependent on the relative levels of the Tanana River and Chena River. Groundwater is typically recharged by the Tanana River and drained by the Chena River, causing a northwesterly groundwater flow. Depending on various seasonal factors, groundwater may be recharged by both rivers, causing a westerly or northerly flow. Permafrost, where present, likely impedes groundwater movement in the vicinity of the RFTC.

1.2 Contaminant of Concern and Regulatory Levels

The primary contaminants of concern in offsite wells are PFOS and PFOA. Cleanup levels have not been established for PFOS, PFOA, or other PFCs. The U.S. Environmental Protection Agency (EPA) has established a Lifetime Health Advisory (LHA) level for drinking water of 70 ng/L for PFOS, PFOA, or the sum of the two. The CoF has established this as the level above which action should be taken to reduce exposure in drinking water. Following ADEC guidance indicating the precision of the LHA level, we consider combined concentrations in excess of 65 ng/L to be exceedances of the LHA.

The CoF was notified of the new, LHA level on May 19, 2016. The LHA level supersedes the former Provisional Health Advisory (PHA) levels of 200 ng/L PFOS and 400 ng/L PFOA. Prior to publication of the LHA, PHA levels were used for this project.

1.3 Project Objectives and Scope

At the request of the ADEC, Shannon & Wilson, Inc. identified and sampled private wells in five areas near the RFTC to date. Our primary objective of the services described in this report was to evaluate the potential for human exposure to PFC-containing water in private water-supply wells. This report describes the findings of our initial private well search and sampling effort (Area 1), E.M. Jones Subdivision sampling effort (Area 2), and Northwest Quadrant well search and sampling effort (Area 3). We sampled a subset of identified private wells and MWs in these areas, described as follows. Expansion of our well search into each subsequent area was authorized iteratively based on the results of private well sampling. This report summarizes the findings of our February to May 2016 well search and sampling.

Our well searches sought to identify private water-supply wells, the owner of the property on which the well is located, if the well is in use, how the well is used (e.g., drinking, washing, irrigation, etc.), and well logs or well details if available. Following completion of the well search, we collected analytical water samples for determination of PFCs from a subset of identified private wells. We submitted the water samples to TestAmerica, Inc., for quantitation of 19 PFCs by Method WS-LC-0025.

Area 1 consists of the area within one half mile of the RFTC and west of Lathrop Street, plus 30th Avenue to Peger Road. Area 2 consists of the E.M. Jones Subdivision, a primarily residential area bound by Peger Road to the east, Davis Road to the south, Kiana Street to the west, and Kobuk Avenue to the north. Area 3 consists of the northwest quadrant between a half-and 1-mile radius of the RFTC. This area is bound by Eagan Avenue to the north, Lathrop Street to the east, and the Mitchell Expressway to the south. Our scope of services included a well search for Areas 1 and 3; we did not conduct a well search in Area 2.

2.0 FIELD ACTIVITIES

This section summarizes field activities performed between February 11 and May 17, 2016, in an effort to identify and sample private water-supply wells in our previously described search areas. These areas are shown in Figure 1, Private Well Search and Sample Areas.

2.1 Well Search and Sample Areas

On February 11, 2016, we began contacting owners and occupants in Area 1, our initial search area. Our well search methodology began with downloading a list of improved and unimproved parcels and the owners of those properties within the search area from the FNSB property database. We also referenced the Alaska Department of Natural Resources (DNR) Well Log Tracking System and subsurface water rights files listed on the DNR Water Estate Map.

The goal of our well search was to contact the owner or occupant of each improved parcel within the search area to identify the presence or absence of a well. We began by preparing a well search letter and fact sheet using CoF letterhead. The letters and fact sheets, included in Appendix A, describe the potential presence of PFCs in groundwater near the RFTC. Using FNSB records, we developed a list of property owners within Area 1 and subdivided the list into smaller extents. We prepared maps for each of these extents, and cross-referenced our lists with property records to determine which parcels were improved (i.e., developed) and which were vacant. We prepared mailers including the well search letter, one-page fact sheet, *Private Well Inventory Survey Form*, and pre-addressed envelope (Appendix A).

We mailed the well search letter to parcels along International and Industrial Avenues, the primarily commercial portion of Area 1, on February 9 and 10. We hand-delivered the well search letter to owners or occupants whose property adjoins Peger Lake, the primarily residential portion of Area 1, on February 11 and 12. We made a reasonable attempt to contact each owner or occupant in the search area. Where we were unable to make contact in person or via mail, we followed up via telephone where contact information was available, made multiple visits to the property in question, and/or questioned nearby property owners. We completed a *Private Well Inventory Survey Form* for each identified well, copies included in Appendix B for each of the three search areas. In some cases the *Survey Forms* were completed by the owner or occupant themselves, in others they were completed by Shannon & Wilson personnel in person or via telephone.

We used information obtained from completed *Survey Forms* and subsequent conversations with property owners and occupant to categorize wells based on use. These category designations were developed in coordination with the CoF and ADEC, and are described as follows.

• Category 1: wells that are used for drinking or cooking, as reported by owners or occupants

- Category 2: wells that are used for dish washing and other residential purposes. Homes or businesses where the occupants report that they do not drink the water, but where water-supply wells lead to kitchen or bathroom faucets, are considered category 2 wells.
- Category 3: wells that are used for industrial and outdoor purposes only, such as irrigation or cleaning. These wells are considered non-drinking-water wells.

We identified 29 parcels with confirmed active wells, five confirmed unused, and four inferred water wells within Area 1. Well search results are summarized in Tables 1 and 4, organized by presence or absence of a well and parcel account number (PAN). Please note that in most cases well depths are reported by owners, occupants, or developers. In some cases depths were obtained from well logs or drilling records. The results of the well search in Area 1 are depicted in Figure 2, PANS and Results of Well Search Southwest of RFTC.

Yes – active well	29
Yes – inferred well	4
Yes – unused well	5
No – inferred	18
No – confirmed	73
Total parcels	129

TABLE 1AREA 1 WELL SUMMARY

On April 7, we expanded the sampling area to include Area 2. Groundwater monitoring of trichloroethene and benzene plumes originating at the ADOT&PF Peger Road Facility is ongoing by Ahtna Engineering Services, LLC (Ahtna), under the direction of the ADEC. The Ahtna private-well monitoring area includes the entirety of Area 2 and overlaps with several parcels in the northwest portion of Area 3 (Figure 1). According to Ahtna, the last private well search in the area was conducted in 2013. It is possible but unlikely that new wells have been installed in the Ahtna private-well monitoring area since 2013.

Mr. Andrew Weller of Ahtna provided well search records for this area on April 8; we made a reasonable attempt to contact the owners or occupants of identified, active and unused wells. We did not contact the owners or occupants of properties without wells, per Ahtna records. We were able to sample six private wells in the E.M. Jones subdivision. Although we did not conduct a well search within Area 2, we obtained relevant well-search data while scheduling sampling appointments. This information is summarize below in Table 2 and in Table 5.

Yes – active well	6
Yes – inferred well	0
Yes – unused well	16
No – inferred	70
No – confirmed	2
Total parcels	94

TABLE 2AREA 2 WELL SUMMARY

On April 26, we expanded the search area to include Area 3 to the north of the Mitchell Expressway. Our well search methodology was the same as for Area 1, with the following exceptions. Our first contact attempt for properties in Area 3 was via telephone, where contact information was available. We revised the Area 1 well-search letter and fact sheet to reflect project changes on April 28; these documents are included in Appendix A. For properties contacted via telephone, we did not mail or hand-deliver the revised well-search letter.

Excluding MWs, we identified 10 parcels with confirmed active wells within Area 3. Several parcels contain more than one well; we have identified 20 water-supply wells in the northwest quadrant search area. Well-search results, including names and addresses, are summarized in Tables 3 and 5. The results of the well search in Area 3 are depicted in Figure 3, PANS and Results of Well Search Southwest of RFTC.

Yes – active well	10
Yes – inferred well	0
Yes – unused well	2
No – inferred	0
No – confirmed	27
Total parcels	39

TABLE 3AREA 3 WELL SUMMARY

2.2 Private and Monitoring Well Sampling

We have conducted four sampling events that include mainly samples from Areas 1 through 3. Shannon & Wilson personnel Marcy Nadel, Geologist; Tiffany Green, Environmental Scientist; and Scott Hummel, Chemist collected analytical water samples from private wells and MWs in Areas 1 through 3. These individuals are State of Alaska Qualified Samplers per 18 AAC 75.333[c] and 18 AAC 78.088[c]. Copies of the original *Private Well Sampling Logs* and *Monitoring Well Sampling Logs* are included in Appendix C.

We collected water samples from a subset of identified private wells in these geographic areas. We selected wells to sample based on well use and proximity to wells of a similar depth. We initially sampled each category 1 well, where possible, and a representative subset of category 2 and 3 wells. We have since sampled additional wells in Areas 1 through 3; these results will be included in the next quarterly report. We also sampled two groundwater MWs associated with the ADOT&PF Peger Road Facility at 2301 Peger Road (PAN 483656). We obtained permission from Mr. Sam Myers of ADOT&PF and Mr. Jim Fish of ADEC prior to sampling these MWs.

We collected the private well samples from a location in the plumbing upstream of any water-treatment system or water softener, where possible. We purged the systems prior to sampling by allowing the water to run until its pH, temperature, and conductivity stabilized and the water appeared clear. We measured parameters using a multiprobe water quality meter (YSI) and recorded these measurements approximately once every three minutes until the parameters had stabilized. The following values were used to indicate stability: ± 0.1 pH, ± 0.5 degrees Celsius (°C) temperature, and ± 3 percent conductivity. For residential and commercial systems we discharged purge water to an indoor sink or to the ground surface. In some cases indoor plumbing leads to the municipal sewer system; in other cases it leads to a private septic system.

For ADOT&PF MWs and IGSA irrigation wells, we treated purge water using a granular activated carbon (GAC) filter prior to discharge. We did not treat purge water from the Fairbanks Youth Soccer Association irrigation (FYSA) well. Following parameter stabilization, we collected PFC water samples using laboratory-supplied containers. In cases when the sampling location was difficult to access (e.g., close to the floor, in a corner, etc.) we collected the water sample using a disposable plastic cup and immediately transferred its contents to the laboratory-supplied containers.

For the two ADOT&PF MWs, we collected analytical water samples using a submersible pump and disposable non-Teflon tubing. We did not collect an equipment-rinsate sample for this phase, but have collected rinsate samples at a 10-percent frequency for the overall project. We measured the total well depth and depth to water in each MW prior to sampling. We measured the well depth of MW-504 as 26.8 feet below the top of casing (TOC) and MW-207A as 58.3 feet below the TOC. We observed that MW-504 appears to have been impacted by frost jacking; we removed 0.3 inches of PVC casing to allow us to replace the flush-mounted monument cap. Following sampling, we locked both wells using the original locks.

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On February 22 and 23, we conducted our initial round of sampling (laboratory Work Order [WO] 17423). This sampling event consisted of ten private wells distributed within the search area and with a range of depths, and one field duplicate. On March 14, we collected an additional 10 samples from private wells in Area 1, one upgradient private-well sample, and one field duplicate (WO 17748). On April 18 and 19 we collected three private-well samples from Area 1, five samples from Area 2, one sample from Area 3, two upgradient wells samples, and two field duplicate samples (WO 18463). On May 16 and 17, we collected one private-well sample from Area 1, one sample from Area 2, nine samples from Area 3, one outlier well on Standard Avenue, two MW samples, one field duplicate sample (WO 19030).

Following consultation with ADEC and the CoF, we have since revisited wells identified during our Area 1 and Area 3 well searches and sampled most of these wells. Additionally, we were unable to collect a sample from PAN 87149 during our initial Area 1 sampling effort due to pump inoperability and availability of the owners. Analytical results for these samples will be included under separate cover.

2.3 Upgradient Wells

At the request of the ADEC, we identified and sampled three wells outside of Areas 1 through 3. There private wells are located between 0.4 and 0.6 miles west, south, and southwest from the RFTC. Based on knowledge of regional groundwater flow directions, these wells are considered upgradient or cross gradient from the RFTC.

- MSI Auto Parts at 1307 30th Avenue, estimated 30 foot deep well
- Young's Gear at 1711 Van Horn Road, 103 foot deep well
- City Electric at 3540 Holt Road, 91 foot deep well

These wells were sampled using the purge and sample-collection methods described for other private wells. We sampled the water-supply well at MSI Auto Parts as part of our March private well sampling event. We sampled the remaining two upgradient and cross gradient wells as part of our April sampling event.

2.4 Sample Custody, Storage, and Transport

Immediately after collection, the sample jars for each location were placed in a Ziploc bags and stored in a designated sample cooler maintained at approximately 4 °C with ice substitute. Shannon & Wilson maintained custody of the samples until submitting them to the laboratory for analysis. For shipping we packaged analytical samples and chain-of-custody (COC) forms in a

hard plastic cooler with an adequate quantity of frozen ice substitute, packing material as necessary to prevent bottle breakage, and a laboratory-supplied liner bag. We applied Shannon & Wilson custody seals to the cooler, which were observed to be intact upon receipt by the laboratory.

We shipped sample coolers to TestAmerica Laboratories, Inc. (TestAmerica) in West Sacramento, California using FedEx priority overnight service. This allowed sufficient time for the laboratory to analyze the samples within holding-time requirements of the analytical method. The complete TestAmerica laboratory reports are included in Appendix D (WOs 17423, 17748, 18463, and 19030).

2.5 Notification of Results

Upon completion of review of the analytical data, we prepared letters to owners and occupants informing them of the results for the sample from their well, including upgradient wells. These letters were tailored to each property and analytical sample, and included the following information:

- sample name;
- analytical result for PFOS and PFOA;
- comparison of analytical results to PHA levels or LHA level;
- description of the project;
- those pages of the TestAmerica laboratory report that apply to the owner or occupant's water-well sample; and
- the updated RFTC fact sheet.

When requested, results letters were e-mailed to owners or occupants instead of mailed in hard copy. We also contacted some owners and occupants via telephone to notify them of their results prior to letter preparation. At a minimum, we contacted the owners of those properties whose results exceeded the PHA levels or LHA level, and those who requested to be notified immediately. For our first two sampling events, we telephoned the owner or occupant of each residential property.

The CoF was notified of the new, LHA level on May 19, 2016. At the request of the CoF we prepared advisory letters to the owners and occupants of wells sampled before that date to notify them of the LHA level. We prepared 37 letters, tailored to each owner or occupant. The LHA letter template is included in Appendix A; highlighted portions of the template letter are those that varied with each mailing. The LHA letters were mailed on May 25, 2016.

2.6 Alternative Water Source

The CoF has chosen to provide bottled water deliveries at no cost to owners and occupants whose category 1 or 2 well water exceeds the LHA level, until they are provided with a long-term alternate water source. Some additional residents were offered bottled water deliveries due to their proximity to homes with LHA exceedances. Water deliveries are being coordinated by Mr. Ernie Misewicz, the Assistant Fire Chief of the Fairbanks Fire Department, and are ongoing. The following homes and businesses have been offered bottled water deliveries; some have declined.



2.7 Deviations

In general, we conducted our services in accordance with the approved proposals. The following are the deviations from our agreed-upon scope of services.

- Our three proposals call for downloading a list of improved parcels from the FNSB database. After cross-referencing the FNSB list with aerial photographs we discovered some inconsistencies; we therefore downloaded and used a list of both improved and unimproved parcels.
- Our proposal dated March 15, 2016, called for our first contact attempt with owners and occupants in the search area to be via telephone. We first contacted owners and occupants in Area 1 by mailing or delivering a well-search letter. We only contacted these individuals via telephone, where we were unable to reach them using other means.
- Our proposal dated April 14, 2016, stated that we will provide a *Private Well Inventory Survey Form* to owners and occupants in Area 3. We first contacted some owners and

occupants in Area 3 via telephone; in these cases, a well search letter and *Survey Form* were not provided.

• At the request of the CoF and ADEC, we prepared and mailed advisory letters to the owners or occupants of sampled wells in late May 2016 (Appendix A). These letters were intended to notifying them of the newly published EPA LHA level.

3.0 ANALYTICAL RESULTS

We submitted the water samples to TestAmerica for determination of PFCs using Method WS-LC-0025, the laboratory's in-house method. This method analyzes for 19 PFCs, including PFOS, PFOA, and the four other PFCs listed in the EPA's Unregulated Contaminant Monitoring Rule (UCMR). The TestAmerica laboratory reports and ADEC Laboratory Data Review Checklists for each WO are included in Appendix D.

Analytical results and other relevant information for Area 1 are depicted in Figure 4, PANs, PFOS and PFOA Results, and Well Depths Southwest of RFTC. Analytical results for Areas 2 and 3 are depicted in and Figure 5, PANs, PFOS and PFOA Results, and Well Depths Northwest of RFTC.

3.1 February Private Well Samples

Table 6 summarizes the concentrations of PFCs in February private well samples (WO 17423). Sample *87408* is a field duplicate of sample *87418*. The analytical result for one private well, sample *87173*, exceeds the EPA LHA level for combined PFOS and PFOA concentrations. This result is 220 ng/L PFOS and 9.7 ng/L PFOA for the well located at 2145 30th Avenue.

3.2 March Private Well Samples

Table 7 summarizes the concentrations of PFCs in March private well samples (WO 17748). Sample *522484* is a field duplicate of sample *522384*. The analytical results for three private wells exceed the LHA level. The highest of these results is 340 ng/L PFOS and 12 ng/L PFOA for sample *522484* / 522384, the well located at 2051 30th Avenue.

3.3 April Private Well Samples

Table 8 summarizes the concentrations of PFCs in April private well samples (WO 18463). Sample *167854* is a field duplicate of sample *167754* and sample *526676* is a duplicate of *526576*. The analytical results for two private wells exceed the LHA level, samples *127124* and *526676 / 526576*. The higher of these two results is 68 ng/L PFOS and 14 ng/L PFOA for sample *127124*, the well located at 2525 17th Avenue.

3.4 May Private Well Samples

Table 9 summarizes the concentrations of PFCs in May private and groundwater MW samples (WO 19030). None of the analytical results in this WO exceed the LHA level. The highest results are 38 ng/L PFOS in samples *597517-2* and *MW-207A*, and 6.3 ng/L PFOA in sample *671300*.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

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

The laboratory applies the letter 'J' to a detection less than the limit of quantitation but greater than the detection limit; this "flagged" datum is considered an estimated concentration. We reviewed the data using the current ADEC Laboratory Data Review Checklist and applied a standardized set of flags to any data brought into question during the review. During our QC review we applied flags indicating estimated data or analytical bias as applicable. Our QC review did not encounter QA/QC errors that resulted in flags for PFOS or PFOA analytical data.

We reviewed analytical sample results (TestAmerica WOs 17423, 17748, 18463, and 19030) for this project. The laboratory reports, including the case narratives describing the laboratory QA results in detail, along with completed ADEC data-review, are included in Appendix D. Laboratory QC procedures included evaluating surrogate recovery, performing continuing calibration checks, analyzing method blanks, and checking laboratory control samples to assess accuracy. Please refer to Appendix D for details regarding the results of our QA review for these four WOs.

By working in general accordance with our proposed scope of services, we consider the samples we collected for this project to be representative of site conditions at the locations and times they were obtained. Based on our QA review, no samples were rejected as unusable due to QC failures, and our completeness goal of obtaining 85 percent useable data was met. In general, the quality of the analytical data for this project does not appear to have been compromised by analytical irregularities and is adequate for the purposes of our assessment.

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5.0 CONCLUSIONS AND RECOMMENDATIONS

Of the private and MW results discussed in this report, there are seven combined PFOS and PFOA concentrations exceeding the effective LHA level of 65 ng/L. Five of these wells are located on 30th Avenue to the west of the intersection with North Van Horn Court. The other two wells are located at Avenue and in the Davis Road right-of-way next to the CoF maintenance yard (MW-507). These analytical results are summarized in Figure 4 for wells to the southwest of the RFTC (Area 1) and Figure 5 for wells to the northwest (Areas 2 and 3).

Based on our understanding of offsite private well data, Shannon & Wilson offers the following recommendations:

- continue to expand the private well search area as necessary to assess human exposure risk to PFOS- and PFOA-containing water;
- continue to provide an alternate water source to the occupants of homes or businesses whose well water exceeds the LHA level;
- continue to work with the ADEC and Alaska Department of Health and Human Services to educate the public regarding the potential health effects of exposure to PFC-containing water;
- decommission the RFTC burn pit; and
- install offsite groundwater MWs to the satisfaction of ADEC to study groundwater flow directions and the presence of permafrost.

Future private well search and sample results will be included under separate cover. We anticipate that this report will be the first of two 2016 quarterly reports describing offsite tasks and summarizing analytical results.

6.0 LIMITATIONS

The observations and conclusions described in this report are based solely on the scope of service described in and implemented pursuant to the signed agreements dated March 15, March 29, and April 14, 2016, between the City of Fairbanks and Shannon & Wilson, Inc. Shannon & Wilson has not performed any observation, investigation, study, or testing that is not specifically listed in the scope of service, or that was not developed in coordination with the City of Fairbanks. Other areas of contamination that were not obvious during our site work could be present at the site. Shannon & Wilson is not liable for failing to discover any condition whose discovery required the performance of services not authorized by the Agreement.

This report was prepared for the exclusive use of our Client and their representatives to document environmental conditions at the Regional Fire Training Center site. This work presents our professional judgment as to the conditions in the site. Information presented here is based on the sampling and analyses we performed. Our sampling was intended to confirm the presence or absence of selected contaminants at the sampled locations. It should not be construed as a definite conclusion about the soil conditions in the area, and it is possible our tests do not represent the highest levels of contaminants for which laboratory analyses were not performed. Interpretations and recommendations made by Shannon & Wilson are based solely upon information available to Shannon & Wilson at the time the interpretations and recommendations are made.

The information included in this report is based on limited sampling at the site and should be considered representative of the time and location at which the sampling occurred. It was not the intent of our investigation to detect the presence of soil, groundwater, or surface water contaminants other than those for which laboratory analyses were performed; no conclusions can be drawn on the presence or absence of other contaminants. The observed levels of contamination may be dependent upon changes due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Due to such changes, or other factors beyond our control, our observations and recommendations applicable to this site may need to be revised. If substantial time has elapsed between submission of this report and the start of activities or action based upon it, we recommend this report be reviewed to determine the applicability of the conclusions. We have prepared and included in the Appendix E, "*Important Information about your Geotechnical/Environmental Report*," to assist you and others in understanding the use and limitations of our reports.

Within the limitations of scope, schedule, and budget, Shannon & Wilson has prepared this report in a professional manner, using that level of skill and care normally exercised for similar projects under similar conditions by reputable and competent environmental consultants currently practicing in this area.

The data presented in this report are based on limited research and sampling at the site and should be considered representative at the time of our observations. Note too that the passage of time may affect conditions at the sampling locations. Shannon & Wilson is not responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time the report was prepared. We also note that the facts and conditions referenced in this report may change over time, and that the facts and conditions set forth here

are applicable to the facts and conditions as described only at the time of this report. We believe that the conclusions stated here are factual, but no guarantee is made or implied.

TABLE 4 AREA 1 WELL SEARCH RESULTS Note: This table contains personal information and is not intended for public distribution.

This table contains personal information of residents in the search area. Content has been removed for confidentiality.

August 2016

31-1-11735-005

TABLE 5 AREA 2 AND 3 WELL SEARCH RESULTS Note: This table contains personal information and is not intended for public distribution.

This table contains personal information of residents in the search area. Content has been removed for confidentiality.

August 2016

31-1-11735-005

TABLE 6 SUMMARY OF FEBRUARY 2016 PRIVATE WELL SAMPLE ANALYTICAL RESULTS

		1	Sample Location PAN and Address										
			87173	87408	84718	87319	92801	629709	95451	563412	87301	562637	87335
	EPA LHA		(Constant)	10000000	10000				10000	Transfer .	THE OWNER OF		
Analyte	Level	Units				The state				(Constant)	1.000		
Perfluorobutanoic acid (PFBA)	-	ng/L	7.8 JH*	6.1 JH*	7.1 JH*	4.9 JH*	<2.7 B*	<3.5 B*	<3.1 B*	4.7 JH*	<4.1 B*	<3.9 B*	<3.9 B*
Perfluoropentanoic acid (PFPeA)	-	ng/L	18	11	10	8.8	3.5	3.6	7.8	7.3	5.9	7.2	6.1
Perfluorohexanoic acid (PFHxA)	-	ng/L	22	20	19	16	3.6	5.1	7.3	12	10	8.0	8.1
Perfluoroheptanoic acid (PFHpA)	-	ng/L	6.8 JH*	<4.1 B*	<4.1 B*	<3.6 B*	<1.7 B*	<1.7 B*	<2.6 B*	<2.5 B*	<2.6 B*	<2.8 B*	<2.4 B*
Perfluorooctanoic acid (PFOA)	70 [†]	ng/L	9.7	5.0	4.4	3.3	1.5 J	2.6	3.1	3.9	2.3	2.9	2.8
Perfluorononanoic acid (PFNA)	-	ng/L	1.5 J	<1.8	<1.8	<1.8	<1.7	<1.7	0.88 J	<1.7	<1.7	<1.8	<1.8
Perfluorodecanoic acid (PFDA)	-	ng/L	<1.8 B*	<1.8 B*	<1.8	<1.8 B*	<1.7 B*	<1.7 B*	<1.8 B*	<1.7 B*	<1.7	<1.8 B*	<1.8 B*
Perfluoroundecanoic acid (PFUnA)	-	ng/L	<1.8 B*	<1.8 B*	<1.8	<1.8	<1.7 B*	<1.7	<1.8	<1.7 B*	<1.7	<1.8 B*	<1.8 B*
Perfluorododecanoic acid (PFDoA)	-	ng/L	<1.8	<1.8	<1.8	<1.8	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorotridecanoic Acid (PFTriA)	-	ng/L	<1.8	<1.8	<1.8	<1.8	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorotetradecanoic acid (PFTeA)	-	ng/L	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.7 B*	<1.7 B*	<1.8 B*	<1.7 B*	<1.7 B*	<1.8 B*	<1.8 B*
Perfluoro-n-hexadecanoic acid (PFHxDA)	-	ng/L	<9.0 B*	<9.0 B*	<9.1 B*	<9.2 B*	<8.7 B*	<8.7 B*	<8.8 B*	<8.6 B*	<8.7 B*	<9.1 B*	<9.2 B*
Perfluoro-n-octandecanoic acid (PFODA)	-	ng/L	<1.8	<1.8	<1.8	0.64 J	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorobutane Sulfonate (PFBS)	-	ng/L	7.8	4.6	6.2	5.1	<1.7	<1.7	1.7 J	3.0	2.6	1.6 J	2.6
Perfluorohexane Sulfonate (PFHxS)	-	ng/L	54	38	36	27	2.3	2.0	6.4	14	15	5.9	11
Perfluoro-1-heptanesulfonate (PFHpS)	-	ng/L	3.0	<1.8	0.65 J	<1.8	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorodecane sulfonate (PFDS)	-	ng/L	<1.8	<1.8	<1.8	<1.8	<1.7	<1.7	<1.8	<1.7	<1.7	<1.8	<1.8
Perfluorooctane Sulfonate (PFOS)	70 [†]	ng/L	220	37	43	32	2.6	2.1	10	13	30	6.7	10
Perfluorooctane Sulfonamide (FOSA)	_	ng/L	<4.6 B*	<1.8 B*	9.8 JH*	<1.8 B*	<1.7	<1.7	<1.8	<3.7 B*	<1.7	<1.8	<1.8
Notes: Sample 87408 is a field duplicate of sample 87418. PAN Parcel Account Number; PAN is also sample number (except for duplicate and background samples) ng/L nanograms per liter LHA Lifetime Health Advisory + EPA LHA level is 70 ng/L for PFOS and PFOA combined. EPA LHA level is 70 ng/L for PFOS and PFOA combined. - EPA LHA level. Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures. J Estimated concentration, result is between method detection limit and RL; flag applied by laboratory. J* Estimated concentration, result is between method detection limit and RL; flag applied by laboratory. J* Estimated concentration, result is between wethod detected interes (RDP) or other QC failure; flag applied by Shannon & Wilson. JH* Estimated concentration on applied by Shannon & Wilson. B* Analyte considered not detected at RL or concentration originally reported in the sample (higher of the two values) due to method-blank detection; flag applied by Shannon & Wilson.													

TABLE 7 SUMMARY OF MARCH 2016 PRIVATE WELL SAMPLE ANALYTICAL RESULTS

		Sample Location PAN and Address												
			652286	92924	87360	87190	3228039	87157	669077	87351	522384	522484	87386	87165
	EPA LHA	1000	Citation 1		(Communit)		(Constant)		(Constant)	(Contractor)	THE OWNER.	(Contractor)	(and the second	-
Analyte	Level	Units			(1997)			-	1	Constant 2			A) *	Ave
Perfluorobutanoic acid (PFBA)	- 1	ng/L	4.0	9.0	2.7	4.7	<1.8	7.6	5.1	3.9	13	12	5.0	8.3
Perfluoropentanoic acid (PFPeA)	- 1	ng/L	6.3	13	1.3 J	5.9	5.2	10	7.1	3.8	21	28	10	18
Perfluorohexanoic acid (PFHxA)		ng/L	12	20	2.1	15	5.2	15	12	7.5	29	31	14	24
Perfluoroheptanoic acid (PFHpA)	_	ng/L	2.8	4.8	0.89 J	3.0	1.1 J	3.6	2.9	2.3	8.9	9.4	4.6	7.3
Perfluorooctanoic acid (PFOA)	70 [†]	ng/L	6.2	4.6	2.6	3.8	5.8	6.0	3.9	3.6	12	11	5.5	7.5
Perfluorononanoic acid (PFNA)		ng/L	0.73 J	1.2 J	<1.8	<1.8	<1.8	1.3 J	<1.8	<1.8	2.8	2.3	0.86 J	4.1
Perfluorodecanoic acid (PFDA)	_	ng/L	<1.8	<1.8 B*	<1.8 B*	<1.8	<1.8 B*	<1.8 B*	<1.8 B*	<1.8	<1.8 B*	<1.8 B*	<1.8 B*	<1.8
Perfluoroundecanoic acid (PFUnA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorododecanoic acid (PFDoA)		ng/L	<1.8	<1.8	<1.8	<1.8	<1.8 B*	<1.8 B*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorotridecanoic Acid (PFTriA)	_	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorotetradecanoic acid (PFTeA)	_	ng/L	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*
Perfluoro-n-hexadecanoic acid (PFHxDA)	_	ng/L	<9.0	0.62 J	<8.8	<8.9	0.35 J	1.2 J	<8.8	0.72 J	<9.2	<9.2	<9.0	2.7 J
Perfluoro-n-octandecanoic acid (PFODA)	-	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8 B*	<1.8 B*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorobutane Sulfonate (PFBS)	-	ng/L	2.8	4.6	<1.8	2.4	<1.8	3.4	3.0	1.8	9.5	12	2.9	8.3
Perfluorohexane Sulfonate (PFHxS)	-	ng/L	16	23	1.8	13	2.3	18	13	9.3	61	78	17	52
Perfluoro-1-heptanesulfonate (PFHpS)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	0.93 J	<1.8	<1.8	3.7 J*	5.7 J*	<1.8	3.5
Perfluorodecane sulfonate (PFDS)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Perfluorooctane Sulfonate (PFOS)	70 [†]	ng/L	42	42	2.1	35	1.9	75	35	9.5	330	340	15	160
Perfluorooctane Sulfonamide (FOSA)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	3.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Notes:	Sample 522	2484 is a f	field duplicate	of sample 5223	84.									
PAN	Parcel Acco	ount Numb	per; PAN is also	o sample numb	er (except for o	duplicate and b	ackground san	nples)						
ng/L	nanograms	per liter												
LHA	Lifetime He	alth Advis	ory											
†				and PFOA con	nbined.									
-	EPA LHA le													
bold	Result exce	eds EPA	LHA level.											
<				han the reportir					I (QC) failures.					
J				etween method										
J*	Estimated of	oncentrat	ion, result is fla	agged due to fie	Id-duplicate re	lative percent d	ifference (RPD) or other QC	failure; flag app	lied by Shanno	on & Wilson.			
B*	Analyte con	sidered no	ot detected at F	RL or concentra	ition originally i	reported in the	sample (higher	of the two valu	ues) due to me	thod-blank dete	ection; flag app	lied by Shanno	on & Wilson.	

TABLE 8 SUMMARY OF APRIL 2016 PRIVATE WELL SAMPLE ANALYTICAL RESULTS

				Sample Location PAN and Address											
			167754	167854	127124	526576	526676	127523	95443	454974	127311	127230	524565	411866	4527158
Analyte	EPA LHA Level	Units													
Perfluorobutanoic acid (PFBA)	- 1	ng/L	6.8 JH*	5.5 JH*	8.0 B	4.0 JH*	4.0 JH*	5.1 JH*	<1.9 B*	<1.8 B*	4.6 JH*	9.8 B	<1.9 B*	3.8 JH*	<1.8 B*
Perfluoropentanoic acid (PFPeA)	-	ng/L	13	13	24	4.5	5.5	12	5.4	5.4	9.9	16	1.4 J	2.6	2.5
Perfluorohexanoic acid (PFHxA)	-	ng/L	17	18	26	9.3	9.0	14	5.0	6.1	13	13	2.8	3.8	2.7
Perfluoroheptanoic acid (PFHpA)	-	ng/L	4.7	4.5	7.5	0.93 J	1.0 J	4.2	2.1	2.0	4.0	5.0	<1.9	0.96 J	0.82 J
Perfluorooctanoic acid (PFOA)	70 [†]	ng/L	8.3	8.9	14	3.0	3.4	6.6	3.2	2.7	6.2	12	1.9	2.3	3.3
Perfluorononanoic acid (PFNA)	-	ng/L	0.97 J*	1.4 J*	3.4	<1.8	<1.8	1.2 J	<1.9	<1.8	1.1 J	2.1	<1.9	<1.8	<1.8
Perfluorodecanoic acid (PFDA)	-	ng/L	<1.8	<1.8	1.3 J	0.77 J	0.84 J	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluoroundecanoic acid (PFUnA)	-	ng/L	0.77 J	<1.8	0.76 J	0.87 J	<1.8	0.71 J	<1.9	<1.8	1.0 J	<1.8	<1.9	<1.8	<1.8
Perfluorododecanoic acid (PFDoA)	-	ng/L	1.1 J	1.0 J	1.0 J	0.93 J	<1.8	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluorotridecanoic Acid (PFTriA)	-	ng/L	<1.8	<1.8	<1.9	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluorotetradecanoic acid (PFTeA)	-	ng/L	0.61 J	1.2 J	0.7 J	0.9 J*	0.36 J*	1.4 J	0.47 J	0.81 J	0.91 J	0.9 J	0.5 J	<1.8	0.93 J
Perfluoro-n-hexadecanoic acid (PFHxDA)	-	ng/L	<1.8 B*	<1.8 B*	<1.9 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.9 B*	<1.8 B*	<1.9 B*	<2.6 B*	<1.9 B*	<1.8 B*	<1.8 B*
Perfluoro-n-octandecanoic acid (PFODA)	-	ng/L	<1.8	0.97 J	<1.9	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluorobutane Sulfonate (PFBS)	-	ng/L	7.9	9.0	6.5	3.2	3.6	7.9	2.0	1.3 J	7.8	4.4	1.5 J	<1.8	<1.8
Perfluorohexane Sulfonate (PFHxS)	-	ng/L	38	49	48	15	12	38	5.4	4.2	31	42	5.2	1.5 J	1.6 J
Perfluoro-1-heptanesulfonate (PFHpS)	-	ng/L	1.9	2.3	2.9	1.4 J*	0.81 J*	1.5 J	<1.9	<1.8	1.4 J	1.2 J	0.88 J	<1.8	<1.8
Perfluorodecane sulfonate (PFDS)	-	ng/L	<1.8	<1.8	<1.9	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9	<1.8	<1.9	<1.8	<1.8
Perfluorooctane Sulfonate (PFOS)	70 [†]	ng/L	47	51	68	65	49	55	5.7	6.7	29	19	21	<1.8	<1.8
Perfluorooctane Sulfonamide (FOSA)	—	ng/L	<1.8	4.3	0.97 J	<1.8	<1.8	<1.8	<1.9	<1.8	<1.9	12	7.1	<1.8	<1.8

Notes: Sample 167854 is a field duplicate of sample 167754 and sample 526676 is a duplicate of 526576.

PAN Parcel Account Number; PAN is also sample number (except for duplicate and background samples) LHA Lifetime Health Advisory

+ EPA LHA Level is 70 ng/L for PFOS and PFOA combined.

EPA LHA level not established.

bold Result exceeds EPA LHA level.

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

J Estimated concentration, result is between method detection limit and RL; flag applied by laboratory.

J* Estimated concentration, result is flagged due to field-duplicate relative percent difference (RDP) or other QC failure; flag applied by Shannon & Wilson.

 JH*
 Estimated concentration biased high; flag applied by Shannon & Wilson.

 B
 Compound was found in the method blank and sample (i.e., method-blank detection); flag applied by laboratory.

B* Analyte considered not detected at RL or concentration originally reported in the sample (higher of the two values) due to method-blank detection; flag applied by Shannon & Wilson.

TABLE 9

SUMMARY OF MAY 2016 PRIVATE AND MONITORING WELL SAMPLE ANALYTICAL RESULTS

				Sample Name and Address or Location													
			471542	515485	521779	582573	593460-1	593460-2	536555-1	597507	597517-1	597517-2	671300	95630	95730	MW-207A	MW-504
Analyte	EPA LHA Level	Units															
Perfluorobutanoic Acid (PFBA)	-	ng/L	<2.2 B*	8.5 JH*	<4.0 B*	<2.3 B*	2.8 JH*	2.8 JH*	<1.8	<1.8 B*	<3.8 B*	3.5 JH*	<7.4 B*	<4.7 B*	4.1 B*	3.3 JH*	<1.8 J*
Perfluoropentanoic Acid (PFPeA)	—	ng/L	<2.2 B*	10 JH*	<4.9 B*	<2.4 B*	3.1	4.4	1.7 J	1.6 J	6.8 JH*	7.5	8.3 JH*	<5.9 B*	<6.1 B*	5.2	<1.8 J*
Perfluorohexanoic Acid (PFHxA)	—	ng/L	1.4 J	8.7	4.6	3.1	3.9	5.3	1.3 J	2.3	6.8	13	8.0	6.7	7.4	9.5	4.8 J*
Perfluoroheptanoic Acid (PFHpA)	-	ng/L	1.0 J	4.2	2.0	1.2 J	1.7 J	1.7 J	<1.8	1.1 J	3.2	2.5	4.0	2.9	2.6	2.4	1.0 J*
Perfluorooctanoic Acid (PFOA)	70 [†]	ng/L	1.2 J	6.1	2.7	1.7 J	3.1	5.5	0.94 J	3.7	4.5	5.7	6.3	4.1	4.2	4.7	2.6 J*
Perfluorononanoic Acid (PFNA)	—	ng/L	<1.8	1.0 J	0.75 J	<1.8	1.2 J	2.8	<1.8	1.8	0.86 J	0.68 J	1.5 J	0.75 J	0.96 J	0.71 J	<1.8 J*
Perfluorodecanoic Acid (PFDA)	-	ng/L	0.40 J	<1.8	<1.8	<1.8	0.91 J	1.6 J	<1.8	1.8	<1.8	0.82 J	0.86 J	0.42 J	0.55 J	<1.7	<1.8 J*
Perfluoroundecanoic Acid (PFUnA)	—	ng/L	<1.8	<1.8 J*	<1.8	<1.8	<1.8 B*	<1.8 B*	<1.8	<1.8 B*	<1.8	<1.8	<1.8	<1.9	<1.8	<1.7	<1.8 J*
Perfluorododecanoic Acid (PFDoA)	-	ng/L	<1.8	<1.8	<1.8	0.57 J	<1.8	0.88 J	<1.8 J*	0.58 J	<1.8	<1.8	<1.8	0.57 J	0.57 J	<1.7	<1.8 J*
Perfluorotridecanoic Acid (PFTriA)	—	ng/L	<1.8	<1.8 J*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.7	<1.8 J*
Perfluorotetradecanoic Acid (PFTeA)	-	ng/L	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.8 B*	<1.9 B*	<1.8 B*	<1.7 B*	<1.8 B*
Perfluoro-n-hexadecanoic Acid (PFHxDA)	-	ng/L	1.8	<1.8	<1.8	<1.8	0.44 J	0.96 J	<1.8	<1.8	<1.8	<1.8	0.62 J	2.4 J*	0.78 J*	0.30 J	<1.8 J*
Perfluoro-n-octandecanoic Acid (PFODA)	-	ng/L	2.2 JL*	<1.8 J*	2.8 JL*	0.89 JL*	<1.8 J*	<1.8 J*	<1.8 J*	<1.8 J*	0.84 JL*	<1.8 J*	2.1 JL*	2.0 JL*	1.6 JL*	<1.7 J*	<1.8 J*
Perfluorobutane Sulfonate (PFBS)	—	ng/L	0.93 J	2.4	1.6 J	1.5 J*	1.8	1.9	<1.8	<1.8	3.2 J*	8.1	2.4	2.4 J*	2.6	3.7	1.1 J*
Perfluorohexane Sulfonate (PFHxS)	—	ng/L	2.0	14	8.3	8.5 J*	7.5	12	1.3 J	4.0	22 J*	40	12	12 J*	15	21	0.88 J*
Perfluoro-1-heptanesulfonate(PFHpS)	—	ng/L	<1.8	<1.8	<1.8	<1.8	<1.8	0.75 J	<1.8	<1.8	<1.8	1.4 J	<1.8	<1.9	<1.8	1.3 J	<1.8 J*
Perfluorodecane Sulfonate (PFDS)	—	ng/L	<1.8 J*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9 J*	<1.8	<1.7	<1.8 J*
Perfluorooctane Sulfonate (PFOS)	70 [†]	ng/L	<1.8 J*	24	9.3	11	17	31	2.3	11	12	38	20	16 J*	17	38	1.7 J*
Perfluorooctane Sulfonamide (FOSA)	—	ng/L	<1.8 J*	0.65 J	<1.8	<1.8 J*	1. 1J*	10 J*	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.7 J*	<1.8 J*

Notes: Sample 95730 is a field duplicate of sample 95630.

ng/L nanograms per liter

LHA Lifetime Health Advisory

FYSA Fairbanks Youth Soccer Association

GHSA Golden Heart Softball Association DOT&PF Department of Transportation & Public Facilities

EPA LHA Level is 70 ng/L for PFOS and PFOA combined. t

EPA LHA level not established.
 Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
 if it is the time limit and RL flag annihied hy laboratory.

J Estimated concentration, result is between method detection limit and RL; flag applied by laboratory.

J* Estimated concentration, result is flagged due to field-duplicate relative percent difference (RDP) or other QC failure; flag applied by Shannon & Wilson.

 JH*
 Estimated concentration biased high; flag applied by Shannon & Wilson.

 JL*
 Estimated concentration biased high; flag applied by Shannon & Wilson.

 JL
 Estimated concentration biased high; flag applied by Shannon & Wilson.

 B
 Compound was found in the method blank and sample (i.e., method-blank detection); flag applied by laboratory.

B* Analyte considered not detected at RL or concentration originally reported in the sample (higher of the two values) due to method-blank detection; flag applied by Shannon & Wilson.







				Burn Pi	RFTC
LEGEND	Combined (PFOS+PFOA) result:				Image source: Pictometry, 2012
Well Search Areas	<10 ng/L				Regional Fire Training Center Fairbanks, Alaska
Parcel sampled	 10 to 34.9 ng/L 	N	0 500	1,000	
Parcel not sampled	35 to 64.9 ng/L		Feet		PANS, PFOS AND PFOA SAMPLE RESULTS, AND WELL DEPTHS
	 65 to 199 ng/L 				SOUTHWEST OF RFTC
	2				August 2016 31-1-11735-005

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LEGEND	Image source: Pictometry, 2012
Combined (PFOS+PFOA) result: Well Search Areas • <10 ng/L	
Parcel sampled	Regional Fire Training Center Fairbanks, Alaska
	PANS, PFOS AND PFOA SAMPLE RESULTS, AND WELL DEPTHS
Feet 65 to 199 ng/L	NORTHWEST OF RFTC
● ≥200 ng/L	August 2016 31-1-11735-005
	Figure 5

APPENDIX A

WELL SEARCH LETTERS AND COF FACT SHEETS

CITY OF FAIRBANKS

800 Cushman Street Fairbanks, AK 99701



PUBLIC WORKS DEPARTMENT Engineering Division

> Telephone (907) 459-6770 Fax (907) 452-5913

February 9, 2016

Dear Property Owner:

The City of Fairbanks (City) was recently alerted to concentrations of perfluorinated compounds (PFCs) in the groundwater at the Regional Fire Training Center (RFTC) at 1710 30th Avenue. From 1984 to around 2004, firefighters from the City and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC. The PFCs recently discovered in the groundwater at the RFTC are in concentrations higher than the U.S. Environmental Protection Agency's preliminary health advisory levels. The City is working with an environmental consulting firm, Shannon & Wilson Inc., and the Alaska Department of Environmental Conservation to identify and sample private water wells near the RFTC to determine if these compounds are present above health advisory levels outside the RFTC property.

Enclosed is a Fact Sheet about PFCs, agency contact information to help address questions, and a Private Well Inventory Survey Form. The City asks that you review this information and <u>return the survey by</u> <u>March 1</u> using the preaddressed envelope. Your participation in the survey helps ensure the study is not only thorough, but also identifies those in the area at risk of drinking PFC-contaminated water.

The City realizes the search area is served by the Golden Heart Utilities water system and that although our municipal code requires connection to the system where service is available, there may be still be some private wells in use which predate the system's installation. In such cases, the City is not going to mandate property owners decommission their wells. With this effort the City wants to identify those who may be at risk of drinking PFC-contaminated water from the RFTC; and if anyone is found to be at risk, the City may be able to assist those property owners with connection to the water system to provide access to clean drinking water.

If you have any questions, please see the list of contacts on the Fact Sheet to help direct you to the most appropriate person/agency for your inquiry. We look forward to receiving your completed survey.

CITY OF FAIRBANKS

Jatkson C. Fox Planning & Permitting Manager

City of Fairbanks

FACT SHEET – Well Testing for Perfluorinated Compounds

FEBRUARY 2016

Perfluorinated compounds (PFCs) are a group of manmade chemicals that have been used for a wide variety of residential, commercial, and industrial uses. PFCs are classified as emerging environmental contaminants because they do not have established regulatory standards, but evolving science has identified potential risk to human health and regulatory standards are under consideration. The City of Fairbanks has discovered PFC contamination at the Regional Fire Training Center (RFTC) at 1710 30th Avenue and is working in coordination with state regulators to identify affected wells and, when necessary, take responsive action. The initial well-search area consists of the area within ½ mile of the RFTC and west of Lathrop Street, as well as 30th Avenue to Peger Road.

KEY MESSAGES & QUICK FACTS

The City has confirmed that PFCs are present in the groundwater at the RFTC and would like to test nearby water wells.

The City will ask to test private wells where it believes PFCs could be present based on the known pattern of groundwater flow.

Test results will typically be available within three weeks.

The U.S. Environmental Protection Agency (EPA) issued a provisional health advisory for two forms of PFCs known as "PFOA" and "PFOS." A provisional health advisory is a concentration above which action should be taken to reduce exposure in drinking water. PFOA refers to perfluorooctanoic acid, and PFOS refers to perfluorooctane sulfonic acid.

The City is considering action to mitigate PFC exposures based on results in drinking water above the EPA provisional health advisory concentrations of:

PFOS: drinking water concentrations greater than 0.2 μ g/L PFOA: drinking water concentrations greater than 0.4 μ g/L

Human health risks associated with PFC exposures have not been definitively established.

PFCs are used in a large number of products ranging from nonstick cookware, fabric waterproofing compound, stain-resistant carpeting, some food packaging, and firefighting agents.

From 1984 to 2004, firefighters from the City of Fairbanks and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC.

PFCs are not known to degrade by natural processes.

For more information about PFCs, see http://www.atsdr.cdc.gov/pfc/index.html.

CONTACTS

For questions about well testing & study: Shannon & Wilson Inc. Julie Keener, Project Manager Phone 907-458-3144 Email jak@shanwil.com

For regulatory questions:

Alaska Dept of Environmental Conservation, Contaminated Sites Program <u>Robert Burgess</u>, Environmental Program Specialist III Phone 907-451-2153 Email <u>robert.burgess@alaska.gov</u>

For questions about PFC health effects:

Alaska Dept of Health & Social Services <u>Ali Hamade</u>, Environmental Public Health Program Manager Phone 907-269-8086 Email <u>ali.hamade@alaska.gov</u>

For questions about the RFTC & all other inquires:

City of Fairbanks, Engineering Division Jackson Fox, Planning & Permitting Mgr Phone 907-459-6758 Email jcfox@ci.fairbanks.ak.us

CITY OF FAIRBANKS

800 Cushman Street Fairbanks, AK 99701



PUBLIC WORKS DEPARTMENT Engineering Division

Telephone (907) 459-6770 Fax (907) 452-5913

April 28, 2016

Dear Property Owner:

The City of Fairbanks (City) was recently alerted to concentrations of perfluorinated compounds (PFCs) in the groundwater at the Regional Fire Training Center (RFTC) at 1710 30th Avenue. From 1984 to around 2004, firefighters from the City and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC. The PFCs recently discovered in the groundwater at the RFTC are in concentrations higher than the U.S. Environmental Protection Agency's preliminary health advisory levels.

The City is working with an environmental consulting firm, Shannon & Wilson Inc., and the Alaska Department of Environmental Conservation to identify and sample private water wells near the RFTC to determine if these compounds are present above health advisory levels outside the RFTC property. In February Shannon & Wilson began contacting property owners and sampling private water-supply wells within approximately one-half mile of the RFTC. In April the well search area was expanded to include properties within approximately one mile to the west and northwest of the RFTC.

Enclosed is a Fact Sheet about PFCs, agency contact information to help address questions, and a Private Well Inventory Survey Form. The City asks that you review this information and <u>return the survey as</u> <u>soon as possible</u> using the preaddressed envelope. Your participation in the survey helps ensure the study is not only thorough, but also identifies those in the area at risk of drinking PFC-contaminated water.

The City realizes that a portion of the search area is served by the Golden Heart Utilities water system, although there may be private wells in use which predate the system's installation in those areas. In such cases, the City is not going to mandate property owners decommission their wells. With this effort the City seeks to identify those who may be at risk of drinking PFC-contaminated water from the RFTC; and if anyone is found to be at risk, the City may be able to assist those property owners with connection to the water system to provide access to clean drinking water.

If you have any questions, please see the list of contacts on the Fact Sheet to help direct you to the most appropriate person/agency for your inquiry. We look forward to receiving your completed survey.

CITY OF FAIRBANKS

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Jackson C. Fox Planning & Permitting Manager

City of Fairbanks

FACT SHEET – Well Testing for Perfluorinated Compounds

APRIL 2016

Perfluorinated compounds (PFCs) are a group of manmade chemicals that have been used for a wide variety of residential, commercial, and industrial uses. PFCs are classified as emerging environmental contaminants because they do not have established regulatory standards, but evolving science has identified potential risk to human health and regulatory standards are under consideration. The City of Fairbanks has discovered PFC contamination at the Regional Fire Training Center (RFTC) at 1710 30th Avenue and is working in coordination with state regulators to identify affected wells and, when necessary, take responsive action. The current well-search area consists of properties within approximately 1 mile to the west and northwest of the RFTC.

KEY MESSAGES & QUICK FACTS

The City has confirmed that PFCs are present in the groundwater at the RFTC and in water from some private wells to the west.

The City will ask to test private wells where it believes PFCs could be present based on the known pattern of groundwater flow.

Test results will typically be available within three weeks.

The U.S. Environmental Protection Agency (EPA) issued a provisional health advisory for two forms of PFCs known as "PFOA" and "PFOS." A provisional health advisory is a concentration above which action should be taken to reduce exposure in drinking water. PFOA refers to perfluorooctanoic acid; PFOS refers to perfluorooctane sulfonic acid.

The City is considering action to mitigate PFC exposures based on results in drinking water above the EPA provisional health advisory concentrations of:

PFOS: drinking water concentrations greater than 200 ng/L PFOA: drinking water concentrations greater than 400 ng/L

Human health risks associated with PFC exposures have not been definitively established.

PFCs are used in a large number of products ranging from non-stick cookware, fabric waterproofing compound, stain-resistant carpeting, some food packaging, and firefighting agents.

From 1984 to 2004, firefighters from the City of Fairbanks and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC.

PFCs are resistant to degradation by natural processes.

CONTACTS

For questions about well testing & study: Shannon & Wilson Inc. Julie Keener, Project Manager Phone 907-458-3144

For regulatory questions:

Email jak@shanwil.com

Alaska Dept of Environmental Conservation, Contaminated Sites Program <u>Robert Burgess</u>, Environmental Program Specialist III Phone 907-451-2153 Email <u>robert.burgess@alaska.gov</u>

For questions about PFC health effects:

Alaska Dept of Health & Social Services <u>Ali Hamade</u>, Public Health Scientist Phone 907-269-8086 Email <u>ali.hamade@alaska.gov</u>

For questions about RFTC & all other inquires:

City of Fairbanks, Engineering Division Jackson Fox, Planning & Permitting Mgr Phone 907-459-6758 Email jcfox@ci.fairbanks.ak.us

CITY OF FAIRBANKS

800 Cushman Street

Fairbanks, AK 99701



PUBLIC WORKS DEPARTMENT Engineering Division

Telephone (907) 459-6770 Fax (907) 452-5913

May 25, 2016

Dear Owner/Occupant Name:

Shannon & Wilson is working as a contractor for the City of Fairbanks to evaluate the potential presence of perfluorinated compounds (PFCs) in groundwater near the Regional Fire Training Center (RFTC) at 1730 30th Avenue. The well-water samples have been analyzed for 19 PFC analytes, including perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).

On May 19, 2016, the U.S. Environmental Protection Agency published an updated health advisory level for PFCs. The new lifetime health advisory level is 70 nanograms per liter (ng/L) for PFOS, PFOA, or the sum of the two. The former provisional health advisory levels were 200 ng/L for PFOS and 400 ng/L for PFOA. Please note that the units of ng/L are equivalent to parts per trillion. There are no advisory levels for the other PFC analytes.

Shannon & Wilson has sampled 44 private water-supply wells and four monitoring wells in the RFTC area to date, including your well/s. The locations of these wells are shown in the enclosed map (Figure 1, PFC Sample Locations as of May 2016). The water sample from your well was mailed to TestAmerica Laboratories, Inc. on May 18, 2016; analytical results are forthcoming. The City is continuing to collect PFC water samples in order to evaluate the extent of PFC-containing groundwater in the area.

The PFOS and PFOA results for six of these wells exceed the new, lifetime health advisory level. The occupants of these homes and their nearest neighbors have been offered//The City is offering bottled water delivery at no cost; deliveries to homes on 30th Avenue began in March. The City is preparing a plan to provide owners and occupants whose well water exceeds the lifetime health advisory level with a long-term alternate water source. The City Council is considering connection to the municipal water supply system and other long-term water-supply solutions.

Please contact me at (907) 459-6758 or email <u>jcfox@ci.fairbanks.ak.us</u> if you have any questions or need additional information. For questions relating to well testing, environmental regulations, or other inquiries please refer to contact information on the enclosed Fact Sheet.

CITY OF FAIRBANKS

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Jackson C. Fox Planning & Permitting Manager

City of Fairbanks

FACT SHEET – Well Testing for Perfluorinated Compounds

MAY 2016

Perfluorinated compounds (PFCs) are a group of manmade chemicals that have been used for a wide variety of residential, commercial, and industrial uses. PFCs are classified as emerging environmental contaminants because they do not have established regulatory standards, but evolving science has identified potential risk to human health and regulatory standards are under consideration. The City of Fairbanks has discovered PFC contamination at the Regional Fire Training Center (RFTC) at 1710 30th Avenue and is working in coordination with state regulators to identify affected wells and, when necessary, take responsive action. The current well-search area consists of properties within approximately 1 mile to the west and northwest of the RFTC.

KEY MESSAGES & QUICK FACTS

The City has confirmed that PFCs are present in the groundwater at the RFTC and in water from some private wells to the west.

The City will ask to test private wells where it believes PFCs could be present based on the known pattern of groundwater flow. Test results will typically be available within three weeks.

The U.S. Environmental Protection Agency (EPA) issued a lifetime health advisory level for PFCs in May 2016. The health advisory level has been set with a sufficient margin of protection for a lifetime of exposure to PFOA and PFOS from drinking water, including for sensitive populations such as children. PFOA refers to perfluorooctanoic acid; PFOS refers to perfluorooctane sulfonate.

The City has adopted the EPA lifetime health advisory level of 70 nanograms per liter (ng/L) for PFOS, PFOA, or the sum of the two as the level above which action should be taken to reduce exposure in drinking water.

The new health advisory level has been set based on the latest peerreviewed science. However, the human health risks associated with PFC exposures have not been definitively established.

PFCs are used in a large number of products ranging from nonstick cookware, fabric waterproofing compounds, stain-resistant carpeting, some food packaging, and firefighting agents.

From 1984 to 2004, firefighters from the City of Fairbanks and other agencies used Aqueous Film Forming Foam, a firefighting agent that contained PFCs, during training to extinguish petroleum fires at the RFTC.

PFCs are resistant to degradation by natural processes.

For more information, please visit: <u>www.epa.gov/ground-water-and-</u> <u>drinking-water/drinking-water-health-</u> <u>advisories-pfoa-and-pfos</u>

CONTACTS

For questions about well testing & study: Shannon & Wilson Inc. Julie Keener, Project Manager Phone 907-458-3144 Email jak@shanwil.com

For regulatory questions:

Alaska Dept of Environmental Conservation, Contaminated Sites Program <u>Robert Burgess</u>, Environmental Program Specialist III Phone 907-451-2153 Email <u>robert.burgess@alaska.gov</u>

For questions about PFC health effects:

Alaska Dept of Health & Social Services <u>Ali Hamade</u>, Public Health Scientist Phone 907-269-8086 Email <u>ali.hamade@alaska.gov</u>

For questions about RFTC & all other inquires:

City of Fairbanks, Engineering Division Jackson Fox, Planning & Permitting Mgr Phone 907-459-6758 Email jcfox@ci.fairbanks.ak.us

APPENDIX B

COMPLETED PRIVATE WELL SURVEY FORMS

This appendix contains personal information. Content has been removed for confidentiality.

APPENDIX C

COPY OF PRIVATE AND MONITORING WELL SAMPLING LOGS

This appendix contains personal information. Content has been removed for confidentiality.

APPENDIX D

ANALYTICAL LABORATORY REPORTS AND ADEC DATA REVIEW CHECKLISTS



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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

TestAmerica Job ID: 320-17423-1

TestAmerica Sample Delivery Group: 31-1-11735-0004 Client Project/Site: City of Fairbanks Fire Training Area

For:

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

Attn: Julie Keener



Authorized for release by: 3/2/2016 1:35:25 PM

David Alltucker, Project Manager I (916)374-4383 david.alltucker@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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



..... LINKS



Visit us at: www.testamericainc.com

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Definitions/Glossary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Qualifiers

LCMS

LUNIS		
Qualifier	Qualifier Description	
*	Isotope Dilution analyte is outside acceptance limits.	
В	Compound was found in the blank and sample.	
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	
CNF	Contains no Free Liquid	
DER	Duplicate error ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision level concentration	
MDA	Minimum detectable activity	
EDL	Estimated Detection Limit	
MDC	Minimum detectable concentration	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
QC	Quality Control	
RER	Relative error ratio	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	
TEF	Toxicity Equivalent Factor (Dioxin)	
TEQ	Toxicity Equivalent Quotient (Dioxin)	

Job ID: 320-17423-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative 320-17423-1

Receipt

The samples were received on 2/25/2016 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.5° C.

LCMS

Method(s) WS-LC-0025: The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 87173 (320-17423-1), 87408 (320-17423-2), 84718 (320-17423-3), 87319 (320-17423-4), 92801 (320-17423-5), 629709 (320-17423-6), 95451 (320-17423-7), 563412 (320-17423-8), 87301 (320-17423-9), 562637 (320-17423-10) and 87335 (320-17423-11). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method(s) WS-LC-0025: The reporting limit for Perfluoro-n-hexadecanoic acid (PFHxDA) was raised due to problems with the calibration curve and low background levels in the instrument for this compound. Results below the new RL should be considered suspect. 87173 (320-17423-1), 87408 (320-17423-2), 84718 (320-17423-3), 87319 (320-17423-4), 92801 (320-17423-5), 629709 (320-17423-6), 95451 (320-17423-7), 563412 (320-17423-8), 87301 (320-17423-9), 562637 (320-17423-10), 87335 (320-17423-11) and (MB 320-101730/1-A)

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

Organic Prep

Method(s) 3535: Due to excessive sediment in sample column became clogged. The remainder of sample was loaded onto an additional column. After elution extracts were combined, respectively. 87408 (320-17423-2), 84718 (320-17423-3), 87319 (320-17423-4) and 87301 (320-17423-9)

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-101730.

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

Lab Sample ID: 320-17423-1

Client Sample ID: 87173

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.8	B	1.8	0.41	ng/L	1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	18		1.8	0.89	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	22		1.8	0.71	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.8	В	1.8	0.72	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	9.7		1.8	0.67	ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.5	J	1.8	0.59	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.87	JB	1.8	0.40	ng/L	1	WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.2	JB	1.8	0.67	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.77	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.3	JB	9.0	0.11	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	7.8		1.8	0.83	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	54		1.8	0.78	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	3.0		1.8	0.64	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	220		1.8	1.2	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	4.6	В	1.8	0.58	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 87408

Lab Sample ID: 320-17423-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	6.1	B	1.8	0.41	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	11		1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	20		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.1	В	1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.0		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.58	JB	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.1	JB	1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.37	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.9	JB	9.0	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	4.6		1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	38		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	37		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	1.8	В	1.8	0.57	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 84718

Lab Sample ID: 320-17423-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.1	B	1.8	0.42	ng/L	1	_	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	10		1.8	0.90	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	19		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.1	В	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.4		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.50	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.8	JB	9.1	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	6.2		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	36		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	0.65	J	1.8	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	43		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Lab Sample ID: 320-17423-3

Lab Sample ID: 320-17423-4

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Client Sample ID: 84718 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type	
Perfluorooctane Sulfonamide (FOSA)	9.8	В	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA	-

Client Sample ID: 87319

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.9	B	1.8	0.42	ng/L		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	8.8		1.8	0.91	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	16		1.8	0.72	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.6	В	1.8	0.74	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.3		1.8	0.69	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.52	JB	1.8	0.40	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.0	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.8	JB	9.2	0.11	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.64	J	1.8	0.62	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	5.1		1.8	0.84	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	27		1.8	0.80	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	32		1.8	1.2	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	1.4	JB	1.8	0.59	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 92801

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	DI	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.7	B	1.7	0.40	ng/L	1	- ī	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	3.5		1.7	0.86	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	3.6		1.7	0.69	ng/L	1	١	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.5	JB	1.7	0.70	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	1.5	J	1.7	0.65	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.53	JB	1.7	0.38	ng/L	1	١	WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.83	JB	1.7	0.65	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.95	JB	1.7	0.17	ng/L	1	١	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.1	JB	8.7	0.11	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	2.3		1.7	0.76	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.6		1.7	1.1	ng/L	1	١	WS-LC-0025	Total/NA

Client Sample ID: 629709

Lab Sample ID: 320-17423-6

Lab Sample ID: 320-17423-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.5	B	1.7	0.40	ng/L	1	_	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	3.6		1.7	0.86	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	5.1		1.7	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.6	JB	1.7	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.6		1.7	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.56	JB	1.7	0.38	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.70	JB	1.7	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid	4.3	JB	8.7	0.11	ng/L	1		WS-LC-0025	Total/NA
(PFHxDA)									
Perfluorohexane Sulfonate (PFHxS)	2.0		1.7	0.75	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.1		1.7	1.1	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Lab Sample ID: 320-17423-7

Client Sample ID: 95451

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.1	B	1.8	0.40	ng/L		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	7.8		1.8	0.87	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	7.3		1.8	0.69	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.6	В	1.8	0.70	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.1		1.8	0.66	ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.88	J	1.8	0.57	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.69	JB	1.8	0.39	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.22	JB	1.8	0.17	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.2	JB	8.8	0.11	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.7	J	1.8	0.80	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	6.4		1.8	0.76	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	10		1.8	1.1	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 563412

Lab Sample ID: 320-17423-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.7	B	1.7	0.39	ng/L	1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	7.3		1.7	0.85	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	12		1.7	0.68	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.5	В	1.7	0.69	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.9		1.7	0.64	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.60	JB	1.7	0.38	ng/L	1	WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.70	JB	1.7	0.64	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.39	JB	1.7	0.17	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.4	JB	8.6	0.11	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.0		1.7	0.79	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	14		1.7	0.75	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	13		1.7	1.1	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	3.7	В	1.7	0.55	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 87301

Lab Sample ID: 320-17423-9

Lab Sample ID: 320-17423-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.1	B	1.7	0.40	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	5.9		1.7	0.86	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	10		1.7	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.6	В	1.7	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.3		1.7	0.65	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.84	JB	1.7	0.17	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.6	JB	8.7	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.6		1.7	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	15		1.7	0.76	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	30		1.7	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 562637

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.9 B	1.8	0.42 ng/L	1	WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 562637 (Continued)

Lab Sample ID: 320-17423-10

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Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	7.2		1.8	0.90	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	8.0		1.8	0.72	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.8	В	1.8	0.73	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.9		1.8	0.68	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.52	JB	1.8	0.40	ng/L	1	WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.87	JB	1.8	0.68	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.29	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.2	JB	9.1	0.11	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.6	J	1.8	0.84	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	5.9		1.8	0.79	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	6.7		1.8	1.2	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 87335

Lab Sample ID: 320-17423-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.9	B	1.8	0.42	ng/L	1	_	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	6.1		1.8	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	8.1		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.4	В	1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.8		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.53	JB	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.2	JB	1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.18	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.3	JB	9.2	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.6		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	11		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	10		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Matrix: Water

Client Sample ID: 87173 Date Collected: 02/22/16 11:04 Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-1

Method: WS-LC-0025 - Perfluo	rinated Hy	drocarbons	5						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	7.8	В	1.8	0.41	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoropentanoic acid (PFPeA)	18		1.8	0.89	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorohexanoic acid (PFHxA)	22		1.8	0.71	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoroheptanoic acid (PFHpA)	6.8	В	1.8	0.72	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorooctanoic acid (PFOA)	9.7		1.8	0.67	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorononanoic acid (PFNA)	1.5	J	1.8	0.59	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorodecanoic acid (PFDA)	0.87	JB	1.8	0.40	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoroundecanoic acid	1.2	JB	1.8	0.67	ng/L		02/26/16 12:22	02/28/16 18:49	1
(PFUnA)									
Perfluorododecanoic acid (PFDoA)	ND		1.8		ng/L			02/28/16 18:49	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	0			02/28/16 18:49	1
Perfluorotetradecanoic acid (PFTeA)	0.77	JB	1.8	0.18	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.3	JB	9.0	0.11	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorobutane Sulfonate (PFBS)	7.8		1.8	0.83	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorohexane Sulfonate (PFHxS)	54		1.8	0.78	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluoro-1-heptanesulfonate (PFHpS)	3.0		1.8	0.64	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorooctane Sulfonate (PFOS)	220		1.8	1.2	ng/L		02/26/16 12:22	02/28/16 18:49	1
Perfluorooctane Sulfonamide (FOSA)	4.6	В	1.8		ng/L		02/26/16 12:22	02/28/16 18:49	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA		*	25 - 150					02/28/16 18:49	1
13C4 PFBA	52		25 - 150					02/28/16 18:49	1
13C2 PFHxA	94		25 - 150					02/28/16 18:49	1
13C4 PFOA	123		25 - 150					02/28/16 18:49	1
13C5 PFNA	105		25 - 150					02/28/16 18:49	1
13C2 PFDA	126		25 - 150 25 - 150					02/28/16 18:49	1
13C2 PFUA	120		25 - 150 25 - 150					02/28/16 18:49	1
13C2 PFD1A 13C2 PFD0A	129		25 - 150 25 - 150					02/28/16 18:49	1
1302 PFD0A 1802 PFHxS	115		25 - 150 25 - 150					02/28/16 18:49	1
									-
13C4 PFOS	108		25 - 150 25 - 150					02/28/16 18:49	1
13C4-PFHpA	116		25 - 150				02/20/16 12:22	02/28/16 18:49	1

Client Sample ID: 87408 Date Collected: 02/22/16 12:48

13C5 PFPeA

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Date Received: 02/25/16 10:15

Method: WS-LC-0025 - Perfluori	nated Hyd	rocarbons							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	6.1	B	1.8	0.41	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluoropentanoic acid (PFPeA)	11		1.8	0.89	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorohexanoic acid (PFHxA)	20		1.8	0.71	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluoroheptanoic acid (PFHpA)	4.1	В	1.8	0.72	ng/L		02/26/16 12:22	02/28/16 19:10	1
Perfluorooctanoic acid (PFOA)	5.0		1.8	0.67	ng/L		02/26/16 12:22	02/28/16 19:10	1

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TestAmerica Sacramento

02/26/16 12:22 02/28/16 18:49

Lab Sample ID: 320-17423-2

Matrix: Water

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Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Client Sample ID: 87408 Date Collected: 02/22/16 12:48 Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-2 Matrix: Water

5 6 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	ND		1.8	0.59	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorodecanoic acid (PFDA)	0.58	JB	1.8	0.40	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluoroundecanoic acid (PFUnA)	1.1	JB	1.8	0.67	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.52	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorotetradecanoic acid (PFTeA)	0.37	JB	1.8	0.18	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.9	JB	9.0	0.11	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.60	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorobutane Sulfonate (PFBS)	4.6		1.8	0.83	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorohexane Sulfonate (PFHxS)	38		1.8	0.78	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.64	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorooctane Sulfonate (PFOS)	37		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 19:10	
Perfluorooctane Sulfonamide (FOSA)	1.8	В	1.8	0.57	ng/L		02/26/16 12:22	02/28/16 19:10	

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared Analyzed Dil Fac	с
13C8 FOSA	3	*	25 - 150	02/26/16 12:22 02/28/16 19:10	Ī
13C4 PFBA	39		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C2 PFHxA	56		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C4 PFOA	72		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C5 PFNA	56		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C2 PFDA	49		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C2 PFUnA	53		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C2 PFDoA	52		25 - 150	02/26/16 12:22 02/28/16 19:10	1
18O2 PFHxS	91		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C4 PFOS	111		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C4-PFHpA	68		25 - 150	02/26/16 12:22 02/28/16 19:10	1
13C5 PFPeA	49		25 - 150	02/26/16 12:22 02/28/16 19:10	1

Client Sample ID: 84718 Date Collected: 02/22/16 13:28 Date Received: 02/25/16 10:15

Analyte	Result Q	ualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	7.1 B		1.8	0.42	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoropentanoic acid (PFPeA)	10		1.8	0.90	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorohexanoic acid (PFHxA)	19		1.8	0.72	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoroheptanoic acid (PFHpA)	4.1 B		1.8	0.73	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorooctanoic acid (PFOA)	4.4		1.8	0.68	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.60	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		02/26/16 12:22	02/28/16 19:32	1

TestAmerica Sacramento

Lab Sample ID: 320-17423-3

Matrix: Water

TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Client Sample ID: 84718 Date Collected: 02/22/16 13:28 Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-3 Matrix: Water

5 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid	0.50	JB	1.8	0.18	ng/L		02/26/16 12:22	02/28/16 19:32	1
(PFTeA)									
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.8	JB	9.1	0.11	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorobutane Sulfonate (PFBS)	6.2		1.8	0.84	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorohexane Sulfonate (PFHxS)	36		1.8	0.80	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluoro-1-heptanesulfonate (PFHpS)	0.65	J	1.8	0.65	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorooctane Sulfonate (PFOS)	43		1.8	1.2	ng/L		02/26/16 12:22	02/28/16 19:32	1
Perfluorooctane Sulfonamide (FOSA)	9.8	В	1.8	0.58	ng/L		02/26/16 12:22	02/28/16 19:32	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	1	*	25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C4 PFBA	56		25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C2 PFHxA	87		25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C4 PFOA	94		25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C5 PFNA	74		25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C2 PFDA	68		25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C2 PFUnA	74		25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C2 PFDoA	71		25 - 150				02/26/16 12:22	02/28/16 19:32	1
1802 PFHxS	120		25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C4 PFOS	114		25 - 150				02/26/16 12:22	02/28/16 19:32	1
13C4-PFHpA	102		25 - 150				02/26/16 12:22	02/28/16 19:32	1

Client Sample ID: 87319 Date Collected: 02/22/16 14:05 Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-4

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.9	B	1.8	0.42	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoropentanoic acid (PFPeA)	8.8		1.8	0.91	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorohexanoic acid (PFHxA)	16		1.8	0.72	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoroheptanoic acid (PFHpA)	3.6	В	1.8	0.74	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorooctanoic acid (PFOA)	3.3		1.8	0.69	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.60	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorodecanoic acid (PFDA)	0.52	JB	1.8	0.40	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.69	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.54	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.51	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorotetradecanoic acid (PFTeA)	1.0	JB	1.8	0.18	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.8	JB	9.2	0.11	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluoro-n-octandecanoic acid (PFODA)	0.64	J	1.8	0.62	ng/L		02/26/16 12:22	02/28/16 19:53	1
Perfluorobutane Sulfonate (PFBS)	5.1		1.8	0.84	ng/L		02/26/16 12:22	02/28/16 19:53	1

RL

1.8

1.8

1.8

1.8

1.8

Limits

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

MDL Unit

0.80 ng/L

0.65 ng/L

1.1 ng/L

1.2 ng/L

0.59 ng/L

D

Prepared

Prepared

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Result Qualifier

27

ND

ND

32

1.4 J B

%Recovery Qualifier

2

57

92

90

59

61

58

64

119

110

99

87

Client Sample ID: 87319

Date Collected: 02/22/16 14:05

Date Received: 02/25/16 10:15

Perfluorohexane Sulfonate

Perfluoro-1-heptanesulfonate

Perfluorodecane sulfonate (PFDS)

Perfluorooctane Sulfonamide

Perfluorooctane Sulfonate (PFOS)

Analyte

(PFHxS)

(PFHpS)

(FOSA) Isotope Dilution

13C8 FOSA

13C4 PFBA

13C2 PFHxA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA

13C2 PFDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Lab Sample ID: 320-17423-4 Matrix: Water

02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

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02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

02/26/16 12:22 02/28/16 19:53

Analyzed

Analyzed

6

Dil Fac

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

Dil Fac

Client Sample ID: 92801

Date Collected: 02/22/16 14:40 Date Received: 02/25/16 10:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.7	B	1.7	0.40	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoropentanoic acid (PFPeA)	3.5		1.7	0.86	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorohexanoic acid (PFHxA)	3.6		1.7	0.69	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoroheptanoic acid (PFHpA)	1.5	JB	1.7	0.70	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorooctanoic acid (PFOA)	1.5	J	1.7	0.65	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.57	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorodecanoic acid (PFDA)	0.53	JB	1.7	0.38	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoroundecanoic acid (PFUnA)	0.83	JB	1.7	0.65	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.51	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.48	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorotetradecanoic acid (PFTeA)	0.95	JB	1.7	0.17	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	3.1	JB	8.7	0.11	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.7	0.59	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorobutane Sulfonate (PFBS)	ND		1.7	0.80	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorohexane Sulfonate (PFHxS)	2.3		1.7	0.76	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.7	0.62	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.1	ng/L		02/26/16 12:22	02/28/16 20:14	1
Perfluorooctane Sulfonate (PFOS)	2.6		1.7	1.1	ng/L		02/26/16 12:22	02/28/16 20:14	1

TestAmerica Sacramento

Lab Sample ID: 320-17423-5

Matrix: Water

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Lab Sample ID: 320-17423-5

Matrix: Water

Client Sample ID: 92801 Date Collected: 02/22/16 14:40 Date Received: 02/25/16 10:15

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	ND		1.7	0.56	ng/L		02/26/16 12:22	02/28/16 20:14	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	2	*	25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C4 PFBA	70		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C2 PFHxA	107		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C4 PFOA	117		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C5 PFNA	106		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C2 PFDA	120		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C2 PFUnA	108		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C2 PFDoA	105		25 - 150				02/26/16 12:22	02/28/16 20:14	1
18O2 PFHxS	120		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C4 PFOS	112		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C4-PFHpA	116		25 - 150				02/26/16 12:22	02/28/16 20:14	1
13C5 PFPeA	101		25 - 150				02/26/16 12:22	02/28/16 20:14	1

Client Sample ID: 629709

Date Collected: 02/22/16 16:15 Date Received: 02/25/16 10:15

Method: WS-LC-0025 - Perfluc	orinated Hy	drocarbon	s						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.5	В	1.7	0.40	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoropentanoic acid (PFPeA)	3.6		1.7	0.86	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorohexanoic acid (PFHxA)	5.1		1.7	0.68	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoroheptanoic acid (PFHpA)	1.6	JB	1.7	0.69	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorooctanoic acid (PFOA)	2.6		1.7	0.65	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.57	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorodecanoic acid (PFDA)	0.56	JB	1.7	0.38	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.65	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.51	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.48	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorotetradecanoic acid (PFTeA)	0.70	JB	1.7	0.17	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.3	JB	8.7		ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.7		ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorobutane Sulfonate (PFBS)	ND		1.7	0.80	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorohexane Sulfonate (PFHxS)	2.0		1.7		ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.7	0.62	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.0	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorooctane Sulfonate (PFOS)	2.1		1.7	1.1	ng/L		02/26/16 12:22	02/28/16 20:35	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.7	0.55	ng/L		02/26/16 12:22	02/28/16 20:35	1
Isotope Dilution	%Recovery		Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	3	*	25 - 150				02/26/16 12:22	02/28/16 20:35	1
13C4 PFBA	64		25 - 150				02/26/16 12:22	02/28/16 20:35	1
13C2 PFHxA	101		25 - 150				02/26/16 12:22	02/28/16 20:35	1
13C4 PFOA	102		25 - 150				02/26/16 12:22	02/28/16 20:35	1

Lab Sample ID: 320-17423-6 Matrix: Water

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6

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Lab Sample ID: 320-17423-6

Lab Sample ID: 320-17423-7

Matrix: Water

Matrix: Water

Dil Fac

1

1 1 1

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6

12 13 14

Client Sample ID: 629709 Date Collected: 02/22/16 16:15 Date Received: 02/25/16 10:15

Isotope Dilution	%Recovery Qu	alifier Limits	Prepared	Analyzed
13C5 PFNA	78	25 - 150	02/26/16 12:22	02/28/16 20:35
13C2 PFDA	84	25 - 150	02/26/16 12:22	02/28/16 20:3
13C2 PFUnA	82	25 - 150	02/26/16 12:22	02/28/16 20:3
13C2 PFDoA	87	25 - 150	02/26/16 12:22	02/28/16 20:35
18O2 PFHxS	118	25 - 150	02/26/16 12:22	02/28/16 20:3
13C4 PFOS	116	25 - 150	02/26/16 12:22	02/28/16 20:3
13C4-PFHpA	113	25 - 150	02/26/16 12:22	02/28/16 20:35
13C5 PFPeA	93	25 - 150	02/26/16 12:22	02/28/16 20:3

Client Sample ID: 95451

Date Collected: 02/22/16 11:33 Date Received: 02/25/16 10:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.1	B	1.8	0.40	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoropentanoic acid (PFPeA)	7.8		1.8	0.87	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorohexanoic acid (PFHxA)	7.3		1.8	0.69	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoroheptanoic acid (PFHpA)	2.6	В	1.8	0.70	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorooctanoic acid (PFOA)	3.1		1.8	0.66	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorononanoic acid (PFNA)	0.88	J	1.8	0.57	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorodecanoic acid (PFDA)	0.69	JB	1.8	0.39	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.66	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.48	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorotetradecanoic acid (PFTeA)	0.22	JB	1.8	0.17	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.2	JB	8.8	0.11	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.59	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorobutane Sulfonate (PFBS)	1.7	J	1.8	0.80	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorohexane Sulfonate (PFHxS)	6.4		1.8	0.76	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.62	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorooctane Sulfonate (PFOS)	10		1.8	1.1	ng/L		02/26/16 12:29	02/28/16 20:56	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.56	ng/L		02/26/16 12:29	02/28/16 20:56	1
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Isotope Dilution	%Recovery Qu	alifier Limits
13C8 FOSA	2 *	25 - 150
13C4 PFBA	71	25 - 150
13C2 PFHxA	110	25 - 150
13C4 PFOA	108	25 - 150
13C5 PFNA	85	25 - 150
13C2 PFDA	89	25 - 150
13C2 PFUnA	94	25 - 150
13C2 PFDoA	106	25 - 150
18O2 PFHxS	126	25 - 150
13C4 PFOS	116	25 - 150
13C4-PFHpA	120	25 - 150

02/26/16 12:29	02/28/16 20:56	1
Prepared	Analyzed	Dil Fac
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1
02/26/16 12:29	02/28/16 20:56	1

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Lab Sample ID: 320-17423-7

Lab Sample ID: 320-17423-8

Matrix: Water

Matrix: Water

Fac

1

Client Sample ID: 95451 Date Collected: 02/22/16 11:33 Date Received: 02/25/16 10:15

Date Received: 02/25/16	5 10:15				
Method: WS-LC-0025 -	Perfluorinated Hydrocarbon	s (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil F
13C5 PFPeA	103	25 - 150	02/26/16 12:29	02/28/16 20:56	_

Client Sample ID: 563412

Date Collected: 02/22/16 12:26 Date Received: 02/25/16 10:15

13C2 PFDA

13C2 PFUnA

13C2 PFDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

Method: WS-LC-0025 - Perfluc	orinated Hy	drocarbon	IS						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.7	В	1.7	0.39	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoropentanoic acid (PFPeA)	7.3		1.7	0.85	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorohexanoic acid (PFHxA)	12		1.7	0.68	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoroheptanoic acid (PFHpA)	2.5	В	1.7	0.69	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorooctanoic acid (PFOA)	3.9		1.7	0.64	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.56	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorodecanoic acid (PFDA)	0.60	JB	1.7	0.38	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoroundecanoic acid (PFUnA)	0.70	JB	1.7	0.64	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.50	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.47	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorotetradecanoic acid (PFTeA)	0.39	JB	1.7	0.17	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.4	JB	8.6	0.11	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.7	0.58	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorobutane Sulfonate (PFBS)	3.0		1.7	0.79	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorohexane Sulfonate (PFHxS)	14		1.7	0.75	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.7	0.61	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.0	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorooctane Sulfonate (PFOS)	13		1.7	1.1	ng/L		02/26/16 12:29	02/28/16 21:39	1
Perfluorooctane Sulfonamide (FOSA)	3.7	В	1.7	0.55	ng/L		02/26/16 12:29	02/28/16 21:39	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	0.7	*	25 - 150				02/26/16 12:29	02/28/16 21:39	1
13C4 PFBA	58		25 - 150				02/26/16 12:29	02/28/16 21:39	1
13C2 PFHxA	94		25 - 150				02/26/16 12:29	02/28/16 21:39	1
13C4 PFOA	91		25 - 150				02/26/16 12:29	02/28/16 21:39	1
13C5 PFNA	68		25 - 150				02/26/16 12:29	02/28/16 21:39	1

02/26/16 12:29 02/28/16 21:39

02/26/16 12:29 02/28/16 21:39

02/26/16 12:29 02/28/16 21:39

02/26/16 12:29 02/28/16 21:39

02/26/16 12:29 02/28/16 21:39

02/26/16 12:29 02/28/16 21:39

02/26/16 12:29 02/28/16 21:39

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

71

76

87

114

115

102

90

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1

1

1

1

1

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Lab Sample ID: 320-17423-9

Matrix: Water

5 6

Client Sample ID: 87301 Date Collected: 02/23/16 10:55 Date Received: 02/25/16 10:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.1	В	1.7	0.40	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoropentanoic acid (PFPeA)	5.9		1.7	0.86	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorohexanoic acid (PFHxA)	10		1.7	0.69	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoroheptanoic acid (PFHpA)	2.6	В	1.7	0.70	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorooctanoic acid (PFOA)	2.3		1.7	0.65	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.57	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.38	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.65	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.51	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.7	0.48	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorotetradecanoic acid (PFTeA)	0.84	JB	1.7	0.17	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.6	JB	8.7	0.11	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.7		ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorobutane Sulfonate (PFBS)	2.6		1.7	0.80	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorohexane Sulfonate PFHxS)	15		1.7	0.76	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.7	0.62	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.1	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorooctane Sulfonate (PFOS)	30		1.7	1.1	ng/L		02/26/16 12:29	02/28/16 22:00	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.7	0.56	ng/L		02/26/16 12:29	02/28/16 22:00	1
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	1	*	25 - 150					02/28/16 22:00	1
13C4 PFBA	60		25 - 150				02/26/16 12:29	02/28/16 22:00	1
13C2 PFHxA	94		25 - 150				02/26/16 12:29	02/28/16 22:00	1
13C4 PFOA	95		25 - 150				02/26/16 12:29	02/28/16 22:00	1
13C5 PFNA	71		25 - 150				02/26/16 12:29	02/28/16 22:00	1
13C2 PFDA	69		25 - 150					02/28/16 22:00	1
13C2 PFUnA	55		25 - 150				02/26/16 12:29	02/28/16 22:00	1
13C2 PFDoA	60		25 - 150					02/28/16 22:00	1
1802 PFHxS	111		25 - 150					02/28/16 22:00	1
13C4 PFOS	110		25 - 150					02/28/16 22:00	1
13C4-PFHpA	105		25 - 150					02/28/16 22:00	1
13C5 PFPeA	92		25 - 150					02/28/16 22:00	1

Client Sample ID: 562637 Date Collected: 02/23/16 10:03

Date Received: 02/25/16 10:03

Method: WS-LC-0025 - Perfluorinated Hydrocarbons									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.9	B	1.8	0.42	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluoropentanoic acid (PFPeA)	7.2		1.8	0.90	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorohexanoic acid (PFHxA)	8.0		1.8	0.72	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluoroheptanoic acid (PFHpA)	2.8	В	1.8	0.73	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorooctanoic acid (PFOA)	2.9		1.8	0.68	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.60	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorodecanoic acid (PFDA)	0.52	JB	1.8	0.40	ng/L		02/26/16 12:29	02/28/16 22:21	1

TestAmerica Sacramento

Lab Sample ID: 320-17423-10

Page 16 of 31

Matrix: Water

TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Client Sample ID: 562637 Date Collected: 02/23/16 10:03 Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-10 Matrix: Water

5 6 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid	0.87	JB	1.8	0.68	ng/L		02/26/16 12:29	02/28/16 22:21	1
(PFUnA)									
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	-		02/26/16 12:29		1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	-		02/26/16 12:29		1
Perfluorotetradecanoic acid (PFTeA)	0.29	JB	1.8	0.18	-		02/26/16 12:29	02/28/16 22:21	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	4.2	JB	9.1	0.11	-		02/26/16 12:29	02/28/16 22:21	1
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorobutane Sulfonate (PFBS)	1.6	J	1.8	0.84	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorohexane Sulfonate (PFHxS)	5.9		1.8	0.79	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorooctane Sulfonate (PFOS)	6.7		1.8	1.2	ng/L		02/26/16 12:29	02/28/16 22:21	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		02/26/16 12:29	02/28/16 22:21	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	2	*	25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C4 PFBA	69		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C2 PFHxA	105		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C4 PFOA	108		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C5 PFNA	98		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C2 PFDA	113		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C2 PFUnA	108		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C2 PFDoA	102		25 - 150				02/26/16 12:29	02/28/16 22:21	1
18O2 PFHxS	112		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C4 PFOS	116		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C4-PFHpA	113		25 - 150				02/26/16 12:29	02/28/16 22:21	1
13C5 PFPeA	100		25 - 150				02/26/16 12:29	02/28/16 22.21	1

Client Sample ID: 87335 Date Collected: 02/22/16 16:38

Date Received: 02/25/16 10:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.9	B	1.8	0.42	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoropentanoic acid (PFPeA)	6.1		1.8	0.91	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorohexanoic acid (PFHxA)	8.1		1.8	0.72	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoroheptanoic acid (PFHpA)	2.4	В	1.8	0.73	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorooctanoic acid (PFOA)	2.8		1.8	0.68	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.60	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorodecanoic acid (PFDA)	0.53	JB	1.8	0.40	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoroundecanoic acid	1.2	JB	1.8	0.68	ng/L		02/26/16 12:29	02/28/16 22:43	1
(PFUnA)									
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorotetradecanoic acid	0.18	JB	1.8	0.18	ng/L		02/26/16 12:29	02/28/16 22:43	1
(PFTeA)									

TestAmerica Sacramento

Lab Sample ID: 320-17423-11

Matrix: Water

Client Sample ID: 87335 Date Collected: 02/22/16 16:38 Date Received: 02/25/16 10:15

Lab Sample ID: 320-17423-11 Matrix: Water

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Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-hexadecanoic acid	4.3	JB	9.2	0.11	ng/L		02/26/16 12:29	02/28/16 22:43	1
(PFHxDA)									
Perfluoro-n-octandecanoic acid	ND		1.8	0.62	ng/L		02/26/16 12:29	02/28/16 22:43	1
(PFODA)									
Perfluorobutane Sulfonate (PFBS)	2.6		1.8		ng/L			02/28/16 22:43	1
Perfluorohexane Sulfonate (PFHxS)	11		1.8	0.80	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorooctane Sulfonate (PFOS)	10		1.8	1.2	ng/L		02/26/16 12:29	02/28/16 22:43	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		02/26/16 12:29	02/28/16 22:43	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	3	*	25 - 150				02/26/16 12:29	02/28/16 22:43	1
13C4 PFBA	58		25 - 150				02/26/16 12:29	02/28/16 22:43	1
13C2 PFHxA	93		25 - 150				02/26/16 12:29	02/28/16 22:43	1
13C4 PFOA	97		25 - 150				02/26/16 12:29	02/28/16 22:43	1
13C5 PFNA	86		25 - 150				02/26/16 12:29	02/28/16 22:43	1
13C2 PFDA	95		25 - 150				02/26/16 12:29	02/28/16 22:43	1
13C2 PFUnA	92		25 - 150				02/26/16 12:29	02/28/16 22:43	1
13C2 PFDoA	93		25 - 150				02/26/16 12:29	02/28/16 22:43	1
			25 - 150				02/26/16 12:29	02/28/16 22:43	1
	109								
1802 PFHxS	109 106		25 - 150				02/26/16 12:29	02/28/16 22:43	1
1802 PFHxS 13C4 PFOS 13C4-PFHpA			25 - 150 25 - 150					02/28/16 22:43 02/28/16 22:43	1

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Prep Type: Total/NA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water

		309 505		•	Dilution Re		3C5 PFN/ 3C2 PFD/		302 000
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
320-17423-1	87173	3 *	52	94	123	105	126	129	115
320-17423-2	87408	3 *	39	56	72	56	49	53	52
320-17423-3	84718	1 *	56	87	94	74	68	74	71
320-17423-4	87319	2 *	57	92	90	59	61	58	64
320-17423-5	92801	2 *	70	107	117	106	120	108	105
320-17423-6	629709	3 *	64	101	102	78	84	82	87
320-17423-7	95451	2 *	71	110	102	85	89	94	106
320-17423-8	563412	0.7 *	58	94	91	68	71	76	87
320-17423-9	87301	1*	60	94	95	71	69	55	60
320-17423-10	562637	2 *	69	105	108	98	113	108	102
320-17423-11	87335	3 *	58	93	97	86	95	92	93
LCS 320-101730/2-A	Lab Control Sample	55	112	112	120	113	118	114	115
LCSD 320-101730/3-A	Lab Control Sample Dup	58	107	116	116	112	118	113	113
MB 320-101730/1-A	Method Blank	60	111	115	130	116	127	127	113
ND 320-101130/1-A		00							110
				-	Dilution Re	covery (Ac	ceptance L	imits)	
				3C4-PFHp					
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)				
320-17423-1	87173	123	108	116	83				
320-17423-2	87408	91	111	68	49				
320-17423-3	84718	120	114	102	87				
320-17423-4	87319	119	110	99	87				
320-17423-5	92801	120	112	116	101				
320-17423-6	629709	118	116	113	93				
320-17423-7	95451	126	116	120	103				
320-17423-8	563412	114	115	102	90				
320-17423-9	87301	111	110	105	92				
320-17423-10	562637	112	116	113	100				
320-17423-11	87335	109	106	106	89				
LCS 320-101730/2-A	Lab Control Sample	116	119	116	114				
LCSD 320-101730/3-A	Lab Control Sample Dup	120	116	119	109				
MB 320-101730/1-A	Method Blank	119	122	124	116				

13C2 PFHxA = 13C2 PFHxA 13C4 PFOA = 13C4 PFOA 13C5 PFNA = 13C5 PFNA 13C2 PFDA = 13C2 PFDA 13C2 PFUnA = 13C2 PFUnA 13C2 PFDoA = 13C2 PFDOA 13C2 PFDoA = 13C2 PFDoA 13C4 PFOS = 13C4 PFOS 13C4-PFHpA = 13C4-PFHpA 13C5 PFPeA = 13C5 PFPeA

Client Sample ID: Method Blank

Prep Type: Total/NA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-101730/1-A Matrix: Water

								i ich iype. i		
Analysis Batch: 101852								Prep Batch:	101730	
Analyte		MB Qualifier	RL	MDI	Unit	D	Prepared	Analyzed	Dil Fac	
Perfluorobutanoic acid (PFBA)	0.801		2.0		ng/N			02/28/1L 17:45	1	
Perfluoroxentanoic acid (PFPeA)	pD	•	2.0		ng/N			02/28/1L 17:45	1	
PerfluoroheHanoic acid (PF6 HA)	p D		2.0		ng/N			02/28/1L 17:45	1	
Perfluorohextanoic acid (PF6 xA)	0.83L	J	2.0		ng/N			02/28/1L 17:45	1	
Perfluorooctanoic acid (PFOA)	pD		2.0		ng/N			02/28/1L 17:45	1	
Perfluorononanoic acid (PFpA)	p D		2.0		ng/N			02/28/1L 17:45	1	
Perfluorodecanoic acid (PFDA)	0.971	J	2.0		ng/N			02/28/1L 17:45	1	
Perfluoroundecanoic acid (PFUnA)	1.54		2.0		ng/N			02/28/1L 17:45	1	
Perfluorododecanoic acid (PFDoA)	рD		2.0		ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
Perfluorotridecanoic Acid (PFTriA)	0.780	J	2.0		ng/N			02/28/1L 17:45	1	
Perfluorotetradecanoic acid (PFTeA)	1.1L	J	2.0		ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
Perfluoro-n-heHadecanoic acid (PF6 HDA)	4.74	J	10		ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
Perfluoro-n-octandecanoic acid (PFODA)	рD		2.0	0.L7	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
Perfluorobutane Sulfonate (PFBS)	рD		2.0	0.92	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
PerfluoroheHane Sulfonate (PF6HS)	рD		2.0	0.87	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
Perfluoro-1-hextanesulfonate (PF6 xS)	рD		2.0	0.71	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
Perfluorodecane sulfonate (PFDS)	рD		2.0	1.2	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
Perfluorooctane Sulfonate (PFOS)	рD		2.0	1.3	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
Perfluorooctane Sulfonamide (FOSA)	1.1L	J	2.0	0.L4	ng/N		02/2L/1L 12:22	02/28/1L 17:45	1	
	MB	MB								
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
13C8 FOSA	60		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C4 PFBA	111		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C2 PFHxA	115		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C4 PFOA	130		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C5 PFNA	116		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C2 PFDA	127		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C2 PFUnA	127		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C2 PFDoA	113		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
18O2 PFHxS	119		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C4 PFOS	122		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C4-PFHpA	124		25 - 150				02/26/16 12:22	02/28/16 17:45	1	
13C5 PFPeA	116		25 - 150				02/26/16 12:22	02/28/16 17:45	1	

Lab Sample ID: LCS 320-101730/2-A Matrix: Water Analysis Batch: 101852

Analysis Batch: 101852	Spike	LCS I	CS				Prep Batch: 101730 %Rec.
Analyte	Added	Result (Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	40.0	39.8		ng/N		100	L0 - 140
Perfluoroxentanoic acid (PFPeA)	40.0	41.5		ng/N		104	L0 - 140
PerfluoroheHanoic acid (PF6 HA)	40.0	41.9		ng/N		105	L0 - 140
Perfluorohextanoic acid (PF6xA)	40.0	38.9		ng/N		97	L0 - 140
Perfluorooctanoic acid (PFOA)	40.0	3L.7		ng/N		92	L0 - 140
Perfluorononanoic acid (PFp A)	40.0	37.0		ng/N		92	L0 - 140
Perfluorodecanoic acid (PFDA)	40.0	41.9		ng/N		105	L0 - 140

TestAmerica Sacramento

Prep Type: Total/NA

Client Sample ID: Lab Control Sample

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-101730/2-A Matrix: Water			Clie	nt Sample ID	: Lab Control Sample Prep Type: Total/NA
Analysis Batch: 101852					Prep Batch: 101730
	Spike	LCS LCS			%Rec.
Analyte	Added	Result Qualifier	Unit	D %Rec	Limits
Perfluoroundecanoic acid	40.0	44.L	ng/N	112	L0 - 140
(PFUnA)					
Perfluorododecanoic acid	40.0	38.8	ng/N	97	L0 - 140
(PFDoA)					
Perfluorotridecanoic Acid	40.0	39.7	ng/N	99	50 - 150
(PFTriA)					
Perfluorotetradecanoic acid	40.0	33.L	ng/N	84	50 - 150
(PFTeA)					
Perfluoro-n-heHadecanoic acid	40.0	37.L	ng/N	94	50 - 150
(PF6HDA)					
Perfluoro-n-octandecanoic acid	40.0	44.5	ng/N	111	50 - 150
(PFODA)					
Perfluorobutane Sulfonate	35.4	3L.5	ng/N	103	50 - 150
(PFBS)					
PerfluoroheHane Sulfonate	37.8	40.1	ng/N	10L	L0 - 140
(PF6HS)	aa (
Perfluoro-1-hextanesulfonate	38.1	41.3	ng/N	109	50 - 150
(PF6xS)		07.0		~~~	50 450
Perfluorodecane sulfonate	38.L	37.8	ng/N	98	50 - 150
(PFDS)	20.2	40.0	10 m /h l	105	10 440
Perfluorooctane Sulfonate	38.2	40.0	ng/N	105	L0 - 140
(PFOS)	40.0	40.4	10 m /h l	100	10,110
Perfluorooctane Sulfonamide	40.0	43.4	ng/N	108	L0 - 140
(FOSA)					

	LCS	LCS	
Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	55		25 - 150
13C4 PFBA	112		25 - 150
13C2 PFHxA	112		25 - 150
13C4 PFOA	120		25 - 150
13C5 PFNA	113		25 - 150
13C2 PFDA	118		25 - 150
13C2 PFUnA	114		25 - 150
13C2 PFDoA	115		25 - 150
1802 PFHxS	116		25 - 150
13C4 PFOS	119		25 - 150
13C4-PFHpA	116		25 - 150
13C5 PFPeA	114		25 - 150

Lab Sample ID: LCSD 320-101730/3-A Matrix: Water Analysis Batch: 101852

Analysis Batch: 101852							Prep Ba	tch: 10	01730
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorobutanoic acid (PFBA)	40.0	41.5		ng/N		104	L0 - 140	4	30
Perfluoroxentanoic acid (PFPeA)	40.0	40.0		ng/N		100	L0 - 140	4	30
PerfluoroheHanoic acid (PF6 HA)	40.0	42.1		ng/N		105	L0 ₋ 140	0	30
Perfluorohextanoic acid (PF6xA)	40.0	38.3		ng/N		9L	L0 _ 140	1	30
Perfluorooctanoic acid (PFOA)	40.0	39.8		ng/N		100	L0 ₋ 140	8	30
Perfluorononanoic acid (PFpA)	40.0	42.2		ng/N		105	L0 - 140	13	30
Perfluorodecanoic acid (PFDA)	40.0	41.5		ng/N		104	L0 - 140	1	30

TestAmerica Sacramento

Prep Type: Total/NA

Client Sample ID: Lab Control Sample Dup

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Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

		<u> </u>		<u> </u>					
Lab Sample ID: LCSD 320-101730/3-A Matrix: Water				Client Sa	ample ID: Lat	Control Prep Ty			4
Analysis Batch: 101852						Prep B			-
	Spike	LCSD	LCSD			%Rec.		RPD	ł
Analyte	Added	Result	Qualifier	Unit	D %Rec	Limits	RPD	Limit	-
Perfluoroundecanoic acid	40.0	45.0		ng/N		L0 - 140	1	30	
(PFUnA)									_
Perfluorododecanoic acid	40.0	40.8		ng/N	102	L0 - 140	5	30	
(PFDoA)									
Perfluorotridecanoic Acid	40.0	38.L		ng/N	9L	50 - 150	3	30	8
(PFTriA)									
Perfluorotetradecanoic acid	40.0	34.4		ng/N	8L	50 - 150	2	30	
(PFTeA)	(0.0								
Perfluoro-n-heHadecanoic acid	40.0	38.0		ng/N	95	50 - 150	1	30	
(PF6HDA)	10.0	40.0			107	50 450		30	
Perfluoro-n-octandecanoic acid	40.0	42.8		ng/N	107	50 - 150	4	30	
(PFODA) Perfluorobutane Sulfonate	35.4	3L.4		ng/N	103	50 - 150	0	30	
(PFBS)	55.4	JL.4		ng/n	105	50 - 150	0	50	
PerfluoroheHane Sulfonate	37.8	35.9		ng/N	95	L0 - 140	11	30	
(PF6HS)									
Perfluoro-1-hextanesulfonate	38.1	44.9		ng/N	118	50 - 150	8	30	
(PF6xS)				0					1
Perfluorodecane sulfonate	38.L	37.9		ng/N	98	50 - 150	0	30	1
(PFDS)									
Perfluorooctane Sulfonate	38.2	39.7		ng/N	104	L0 - 140	1	30	
(PFOS)									
Perfluorooctane Sulfonamide	40.0	41.4		ng/N	103	L0 ₋ 140	5	30	
(FOSA)									
1000 1000									

	LCSD	LCSD	
Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	58		25 - 150
13C4 PFBA	107		25 - 150
13C2 PFHxA	116		25 - 150
13C4 PFOA	116		25 - 150
13C5 PFNA	112		25 - 150
13C2 PFDA	118		25 - 150
13C2 PFUnA	113		25 - 150
13C2 PFDoA	113		25 - 150
18O2 PFHxS	120		25 - 150
13C4 PFOS	116		25 - 150
13C4-PFHpA	119		25 - 150
13C5 PFPeA	109		25 - 150

QC Association Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

LCMS

Prep Batch: 101730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
320-17423-1	87173	Total/NA	Water	3535	
320-17423-2	87408	Total/NA	Water	3535	
320-17423-3	84718	Total/NA	Water	3535	
320-17423-4	87319	Total/NA	Water	3535	
320-17423-5	92801	Total/NA	Water	3535	
320-17423-6	629709	Total/NA	Water	3535	
320-17423-7	95451	Total/NA	Water	3535	
320-17423-8	563412	Total/NA	Water	3535	
320-17423-9	87301	Total/NA	Water	3535	
320-17423-10	562637	Total/NA	Water	3535	
320-17423-11	87335	Total/NA	Water	3535	
LCS 320-101730/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-101730/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-101730/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 101852

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-17423-1	87173	Total/NA	Water	WS-LC-0025	101730
320-17423-2	87408	Total/NA	Water	WS-LC-0025	101730
320-17423-3	84718	Total/NA	Water	WS-LC-0025	101730
320-17423-4	87319	Total/NA	Water	WS-LC-0025	101730
320-17423-5	92801	Total/NA	Water	WS-LC-0025	101730
320-17423-6	629709	Total/NA	Water	WS-LC-0025	101730
320-17423-7	95451	Total/NA	Water	WS-LC-0025	101730
320-17423-8	563412	Total/NA	Water	WS-LC-0025	101730
320-17423-9	87301	Total/NA	Water	WS-LC-0025	101730
320-17423-10	562637	Total/NA	Water	WS-LC-0025	101730
320-17423-11	87335	Total/NA	Water	WS-LC-0025	101730
LCS 320-101730/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	101730
LCSD 320-101730/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	101730
MB 320-101730/1-A	Method Blank	Total/NA	Water	WS-LC-0025	101730

Lab Chronicle

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Lab Sample ID: 320-17423-1

Lab Sample ID: 320-17423-2

Lab Sample ID: 320-17423-3

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Client Sample ID: 87173 Date Collected: 02/22/16 11:04 Date Received: 02/25/16 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			554.7 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	554.7 mL	1.00 mL	101852	02/28/16 18:49	JRB	TAL SAC

Client Sample ID: 87408 Date Collected: 02/22/16 12:48 Date Received: 02/25/16 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			556.3 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	556.3 mL	1.00 mL	101852	02/28/16 19:10	JRB	TAL SAC

Client Sample ID: 84718 Date Collected: 02/22/16 13:28 Date Received: 02/25/16 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			547 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	547 mL	1.00 mL	101852	02/28/16 19:32	JRB	TAL SAC

Client Sample ID: 87319 Date Collected: 02/22/16 14:05 Date Received: 02/25/16 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			544.5 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	544.5 mL	1.00 mL	101852	02/28/16 19:53	JRB	TAL SAC

Client Sample ID: 92801 Date Collected: 02/22/16 14:40 Date Received: 02/25/16 10:15

	Batch	Batch	_	Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			571.7 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	571.7 mL	1.00 mL	101852	02/28/16 20:14	JRB	TAL SAC

Client Sample ID: 629709 Date Collected: 02/22/16 16:15 Date Received: 02/25/16 10:15

Ргер Туре	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			577 mL	1.00 mL	101730	02/26/16 12:22	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	577 mL	1.00 mL	101852	02/28/16 20:35	JRB	TAL SAC

TestAmerica Sacramento

Lab Sample ID: 320-17423-4 Matrix: Water

Lab Sample ID: 320-17423-5

Lab Sample ID: 320-17423-6

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Lab Chronicle

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Lab Sample ID: 320-17423-10

Lab Sample ID: 320-17423-11

Matrix: Water

Matrix: Water

Client Sample ID: 95451

Date Collected: 02/22/16 11:33 Date Received: 02/25/16 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			570.4 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	570.4 mL	1.00 mL	101852	02/28/16 20:56	JRB	TAL SAC

Client Sample ID: 563412 Date Collected: 02/22/16 12:26 Date Received: 02/25/16 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			580.5 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	580.5 mL	1.00 mL	101852	02/28/16 21:39	JRB	TAL SAC

Client Sample ID: 87301 Date Collected: 02/23/16 10:55 Date Received: 02/25/16 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			572.8 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	572.8 mL	1.00 mL	101852	02/28/16 22:00	JRB	TAL SAC

Client Sample ID: 562637 Date Collected: 02/23/16 10:03 Date Received: 02/25/16 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			549.1 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	549.1 mL	1.00 mL	101852	02/28/16 22:21	JRB	TAL SAC

Client Sample ID: 87335 Date Collected: 02/22/16 16:38 Date Received: 02/25/16 10:15

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			546.2 mL	1.00 mL	101730	02/26/16 12:29	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	546.2 mL	1.00 mL	101852	02/28/16 22:43	JRB	TAL SAC

Laboratory References:

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

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Certification Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Alaska (UST)	State Program	10	UST-055	12-18-16
Arizona	State Program	9	AZ0708	08-11-16
Arkansas DEQ	State Program	6	88-0691	06-17-16
California	State Program	9	2897	01-31-17
Colorado	State Program	8	N/A	08-31-16
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-16
Hawaii	State Program	9	N/A	01-31-17
Illinois	NELAP	5	200060	03-17-17
Kansas	NELAP	7	E-10375	05-31-16
Louisiana	NELAP	6	30612	06-30-16
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA44	07-31-16
New Jersey	NELAP	2	CA005	06-30-16
New York	NELAP	2	11666	04-01-16
Oregon	NELAP	10	CA200005	01-29-17
Pennsylvania	NELAP	3	9947	03-31-16
Texas	NELAP	6	T104704399-15-9	05-31-16
US Fish & Wildlife	Federal		LE148388-0	10-31-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	QUAN1	02-28-17
Virginia	NELAP Secondary AB	3	460278	03-14-16 *
Washington	State Program	10	C581	05-04-16
West Virginia (DW)	State Program	3	9930C	12-31-16
Wyoming	State Program	8	8TMS-Q	01-29-16 *

Method Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

	non & Wilson City of Fairbanks Fire Training Area	TestAmerica Job ID: 320-17423- SDG: 31-1-11735-0004					
/lethod	Method Description	Protocol	Laboratory				
VS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC				
Protocol Ref							
TAL SOP	= TestAmerica Laboratories, Standard Operating Procedure						
Laboratory F							
TAL SAC	= TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA	95605, TEL (916)373-5600					

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17423-1 SDG: 31-1-11735-0004

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-17423-1	87173	Water	02/22/16 11:04	02/25/16 10:15
320-17423-2	87408	Water	02/22/16 12:48	02/25/16 10:1
320-17423-3	84718	Water	02/22/16 13:28	02/25/16 10:15
320-17423-4	87319	Water	02/22/16 14:05	02/25/16 10:1
320-17423-5	92801	Water	02/22/16 14:40	02/25/16 10:1
320-17423-6	629709	Water	02/22/16 16:15	02/25/16 10:15
320-17423-7	95451	Water	02/22/16 11:33	02/25/16 10:15
320-17423-8	563412	Water	02/22/16 12:26	02/25/16 10:15
320-17423-9	87301	Water	02/23/16 10:55	02/25/16 10:15
320-17423-10	562637	Water	02/23/16 10:03	02/25/16 10:15
320-17423-11	87335	Water	02/22/16 16:38	02/25/16 10:15

TestAmerica Sacramento

Geotechnical and Environ	ALSON, INC.	CHA	IN-C	OF-C	USTO	DDY	REC	ORE)	Lat		Test Anen	CA
400 N. 34th Street, Suite 100 2043 Westport Center Drive Seattle, WA 98103 St Louis, MO 63146-3564 (314) 699-9660 (314) 699-9660		2705 Saint Andrews Loop, Suite A Pasco, WA 99301-3378 Analysis Parameters/Sample Container Description											
airbanks, AK 997/9 Anchore 907) 479-0600 (907) 50	airbanks Street, Suite 3 age, AK 99518 61-2120 annock Street, Suite 200				\square	N NE C	SV	/	/	/			
ortland, OR 97201-2498 Denver, 03) 223-6147 (303) 82 Sample Identity	CO 80204 25-3800		Date mpled	Cours G	» A	n le		/		/	320-1742	23 Chain of Custody	,
87173	110	04 21	2416	X	2						2	water	
87408	12	48		X	2						2		
87418	12	38		X	2						2		
87319	14	05		X	2						2		
92801)4	40		X	2						2		
629709	10	15		X	2						2		
95451	11	33		X	2						2		
563412	12	26	+	X	2						2		
97301	10	55 2/	23/16	×	2						2		
562637	10	03	F.	X	2			_			2	T	
Project Information Project Number. 31-1-11735			2 Siç		uished	By:	1. I D Signa		Jished E	-		Relinquished By:	3.
Project Name Fairbaits FTC	Received Good Cor	d./Cold -	Pri	nted Name	Not Di			ed Name:	Date	ə:	Prin	ited Name Date;	
Dingoing Project? Yes X No Sampler: HON TX G	Delivery Method (attach shipping bill, if	-		mpany.	non &		ion Comp	bany			Con	npany	
Instructions				Received By: 1. Received By: 2.						Received By: 3.			
Requested Turnaround Time.		-	Sig	Inature	ll TI	me_1015	Signa	lture	Time	э	Sigr	nature Time	
Special Instructions: Please notify us the species upon recippt (Feder)				Printed Name Date 227/6 Printed Name Date					Prin	Printed Name. Date			
istribution White - w/shipment - ret Yellow - w/shipment - fo Pink - Shannon & Wilsor	urned to Shannon & Wilson w r consignee files n - Job File	/ laboratory re	eport Co	mpany			Comp	Dany			Con	npany	

14

No. 33950

3/2/2016 F-19-91/UR

Geotechnical and Environmental Consulta 400 N 34th Street, Suite 100 2043 Westport Center Dr			STODY R	ECORD	Laborato Attn:	Page 2 of 2 my Tost America and Allfreter
Seattle, WA 98103 St Louis, MO 63146-356 (206) 632-8020 (314) 699-9660			Ana	lysis Parameters/Sample		cription
2355 Hill Road Fairbanks, AK 99709 (907) 479-0600 Street, St Anchorage, AK 99518 (907) 561-2120	ite 3	/		(include preservati	/e if used)	
2255 S.W. Canyon Road 1321 Bannock Street, Suit Portland, OR 97201-2498 Denver, CO 80204 (503) 223-6147 (303) 825-3800	Date					
Sample Identity Lab No	Time Sample		<u> </u>			Remarks/Matrix
87335	12038 2122/	16 X	2		Z	- Water
· · · · · · · · · · · · · · · · · · ·						
						- <u>+</u>
			11			
Project Information Sa	mple Receipt	Relinguis	shed By: 1.	Relinguished E	3v: 2.	Relinquished By: 3.
	ber of Containers	Signature	Time: 1140			Signature Time
	s/Intact? Y/N/MA	M. na	Jel.			
	Good Cond./Cold	Printed Name	Date 2/23/	Printed Name. Date	e F	Printed Name: Date
Ongoing Project? Yes No Delivery		Company,	Vacuel	Company		Company.
Sampler.	ping b <u>ill, if any)</u>		Luison	a an inproving		
O Distructions		Received		Received By:	2.	Received By: 3.
Requested Turnaroupe Time.	···	Signature	By: 1.	Signature Time		Bignature Time,
Special Instructions.	<u>_</u>	H XX VA				
		Printed Wame	Date 2/25/16	Printed Name Date	•T	Printed Name Date
Distribution White - w/shipment - returned to Shannor Yellow - w/shipment - for consignee files Pink - Shannon & Wilson - Job File	& Wilson w/ laboratory report	Company:	<u></u>	Сотралу		Company.

14

Page 30 of 31

F-19-91/UR

Client: Shannon & Wilson

Login Number: 17423 List Number: 1 Creator: Nelson, Kym D

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

Job Number: 320-17423-1 SDG Number: 31-1-11735-0004

List Source: TestAmerica Sacramento

Laboratory Data Review Checklist

Completed by: Marcy Nadel
Title:GeologistDate:March 03, 2016
CS Report Name: City of Fairbanks Fire Training Area Report Date: March 02, 2016
Consultant Firm: Shannon & Wilson, Inc.
Laboratory Name: TestAmerica, Inc. Laboratory Report Number: 320-17423
ADEC File Number: 102.38.182 ADEC RecKey Number:
 Laboratory Laboratory a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? □Yes □ No ⊠NA (Please explain.) Comments:
ADEC has not approved an analytical laboratory for this analysis.
 b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved? Yes No XNA (Please explain.) Comments:
Analyses were performed by TestAmerica, Inc. in Folsom, California.
 2. <u>Chain of Custody (COC)</u> a. COC information completed, signed, and dated (including released/received by)? ∑Yes □ No □NA (Please explain.) Comments:
b. Correct analyses requested? Xes No NA (Please explain.) Comments:
 3. Laboratory Sample Receipt Documentation a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)? ∑Yes □ No □NA (Please explain.) Comments: The temperature blank or cooler was measured within the acceptable temperature range of 0 °C to
6 °C upon receipt at the laboratory, as specified in the EPA publication SW-846. This range has

been approved by ADEC.

	mple preservation acceptable – acidified waters, Me latile Chlorinated Solvents, etc.)?	ethanol preserved VOC soil (GRO, BTEX,
vo	\square Yes \square No \square NA (Please explain.)	Comments:
Anal	ysis of PFCs does not require a preservative.	
c. Sar	mple condition documented – broken, leaking (Meth	hanol), zero headspace (VOC vials)? Comments:
The s	sample-receipt form notes that the samples were rec	ceived in good condition.
cor	here were any discrepancies, were they documented ntainers/preservation, sample temperature outside of nples, etc.?	1 1
There	e were no discrepancies.	
	ta quality or usability affected? (Please explain.)	Comments:
No, tl	he data quality and usability were not affected.	
Case Narra a. Pre	esent and understandable? \boxtimes Yes \square No \square NA (Please explain.)	Comments:
b. Dis	screpancies, errors or QC failures identified by the l \square Yes \square No \square NA (Please explain.)	lab? Comments:
The o	case narrative identifies the following discrepancies	3:
11 san consid	Isotope Dilution Analyte (IDA) recovery associated mples is below the method recommended limit of 2 dered affected if the IDA signal-to-noise ratio is gree in the samples.	5% to 150%. Generally, data quality is not
backg	reporting limit for PFHxDA was raised due to probl ground levels in the instrument for this compound. F dered suspect.	
sampl onto a sampl	nic prep method 3535: Due to excessive sediment t les samples "87408," "84718," "87319," and "87301 an additional column. After-elution extracts were co le volume was available to perform a matrix spike/r iated with this organic prep batch.	1." The remainder of sample was loaded ombined. Additionally, insufficient

4.

c.	Were all corrective actions documented? [Yes] No [NA (Please explain.)	Comments:
	Yes; see above.	
d.	What is the effect on data quality/usability according to	the case narrative? Comments:
n	DA recovery failures are considered to affect data qualit nethod reporting limit and organic preparation batch com uality or usability.	
Sampl	es Results	
	Correct analyses performed/reported as requested on C Yes No NA (Please explain.)	OC? Comments:
b.	All applicable holding times met? ∑Yes □ No □NA (Please explain.)	Comments:
-	The hold time of seven days until extraction was met.	
_	All soils reported on a dry weight basis? □Yes □ No ☑NA (Please explain.) N/A; no soil samples were submitted with this work orde	Comments:
	with this work order submitted with this work order	
d.	Are the reported PQLs less than the Cleanup Level or the project?	he minimum required detection level for the Comments:
a	The PQL, equivalent to the TestAmerica Reporting or Repplicable EPA provisional drinking water health advisor roundwater cleanup levels for PFOS and PFOA.	equested Limit (RL), is less than
e.	Data quality or usability affected?	Comments:
-	The data quality and usability were not affected.	
	<u>mples</u> Method Blank i. One method blank reported per matrix, analysis ⊠Yes □ No □NA (Please explain.)	and 20 samples? Comments:

6.

5.

ii. All method blank results less than PQL? ∑Yes ∑ No □NA (Please explain.)

Comments:

Eight PFC analytes were detected in the method blank (MB) at estimated concentrations less than their PQLs (reporting limits, or RLs). These analytes are PFBA, PFHpA, PFDA, PFUnA, PFTriA, PFTeA, PFHxDA, and FOSA.

iii. If above PQL, what samples are affected?

Comments:

Each of the 11 samples were associated with the MB containing detectable perfluorinated compounds. The results for PFTriA are considered unaffected because PFTriA is present at a concentration at least 10-fold greater than the MB concentration.

The results for PFBA, PFHpA, PFDA, PFUnA, PFTeA, PFHxDA, and FOSA are considered to affect at least one sample result because they were present at concentrations within 5 and 10 times that of the MB concentration, between the PQL and 5 times the MB concentration, or less than the PQL.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined? Xes No NA (Please explain.) Comments:

Where not already qualified by the laboratory, these results are considered estimated and biased high (flagged 'JH'), or considered not detected and flagged 'B*' at either the reported sample result or the PQL, whichever is higher.

v. Data quality or usability affected? (Please explain.)

Comments:

Yes; see above.

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
 ∑Yes □ No □NA (Please explain.) Comments:

LCS/LCSD sample results were reported.

 $\Box Yes \Box No \boxtimes NA (Please explain.)$

Comments:

Metals and inorganics were not analyzed as part of 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 □ No □NA (Please explain.) Comments:

Yes; percent recoveries were between 60% and 140% or 150% depending on the analytes, as required by the laboratory method.

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)

 \boxtimes Yes \square No \square NA (Please explain.)Comments:

Yes; LCS/LCSD RPDs were within the laboratory limit of 30%.

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

N/A; percent recoveries and RPDs were within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined? Yes No No NA (Please explain.) Comments:

N/A; no data flags are required.

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

The data quality and usability were not affected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples? Xes No NA (Please explain.) Comments:

The analytical method WS-LC-0025 uses IDA recovery, which entails adding a 13C-isotope of each target analyte and assessing the recovery of each analyte. The isotopically labeled compounds are the surrogates for this method.

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

Yes No NA (Please explain.)

Comments:

With the exception of 13C8 FOSA, the percent recoveries are within the method recommended limit of 25% to 150%. The percent recovery for FOSA is below the method recommended limit for each of the 11 samples.

However, according to the laboratory, data quality is not considered affected if the IDA signal-tonoise ratio is greater than 10:1, which was achieved for all IDAs in the samples.

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

 \bigvee Yes \square No \square NA (Please explain.)

Comments:

N/A; the data did not require flags.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

The data quality and usability were not affected.

- 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.)

YesNoNA (Please explain.)Comments:

PFCs are not volatile compounds, so a trip blank is not required.

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

No trip blank is required; see above.

iii. All results less than PQL?☐ Yes ☐ No ☐ NA (Please explain.)

Comments:

No trip blank is required; see above.

iv. If above	PQL,	what	samples	are	affected?
--------------	------	------	---------	-----	-----------

Comments:

No trip blank is required; see above. v. Data quality or usability affected? (Please explain.) Comments: The data quality and usability were not affected. e. Field Duplicate i. One field duplicate submitted per matrix, analysis and 10 project samples? Yes No NA (Please explain.) Comments: ii. Submitted blind to lab? \forall Yes \Box No \Box NA (Please explain.) Comments: The field duplicate pair "87408" / "87418" was submitted for this work order. iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil) RPD(%) = Absolute value of: $(R_1 - R_2)$ — x 100 $((R_1+R_2)/2)$ Where R_1 = Sample Concentration R_2 = Field Duplicate Concentration Yes No NA (Please explain.) Comments: The RPD value for FOSA is greater than 100%. The RPD values for the other PFC analytes, where calculable for detected results, meet QC criteria. iv. Data quality or usability affected? (Use the comment box to explain why or why not.) Comments: Data quality for FOSA results in the field duplicate pair is considered affected. The results for "87408" and "87418" are considered estimated and flagged 'J' where not already qualified.

f.	Decontamination	or Equipment Blank	(If not used explain why).
		1 1	

1. Decontainmation of Equipment Dialik (If not used	explain wily).
Yes No NA (Please explain.)	Comments:
Reusable equipment was not used in sample collection was not required.	n for this work order, so an equipment blank
i. All results less than PQL?	
Yes No No NA (Please explain.)	Comments:
N/A; an equipment blank was not required.	
ii. If above PQL, what samples are affected?	
	Comments:
N/A; an equipment blank was not required.	
iii. Data quality or usability affected? (Please e	explain.)
	Comments:
The data quality and usability were not affected.	
Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specifi a. Defined and appropriate?	<u>c, etc.)</u>
$\Box Y es \Box No \boxtimes NA (Please explain.)$	Comments:
There were no other data qualifiers used.	



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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

TestAmerica Job ID: 320-17748-1

TestAmerica Sample Delivery Group: 31-1-11735-004 Client Project/Site: City of Fairbanks Fire Training Area

For:

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

Attn: Julie Keener



Authorized for release by: 3/25/2016 11:16:12 AM David Alltucker, Project Manager I (916)374-4383 david.alltucker@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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





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Definitions/Glossary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Qualifiers

LCMS	
Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
В	Compound was found in the blank and sample.

Glossary

Qualifiers		3
LCMS		4
Qualifier	Qualifier Description	
*	Isotope Dilution analyte is outside acceptance limits.	5
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	O
В	Compound was found in the blank and sample.	6
Glossary		7
Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	ŏ
%R	Percent Recovery	
CFL	Contains Free Liquid	9
CNF	Contains no Free Liquid	
DER	Duplicate error ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision level concentration	
MDA	Minimum detectable activity	
EDL	Estimated Detection Limit	
MDC	Minimum detectable concentration	13
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
QC	Quality Control	
RER	Relative error ratio	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	
TEF	Toxicity Equivalent Factor (Dioxin)	
TEQ	Toxicity Equivalent Quotient (Dioxin)	

Job ID: 320-17748-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative 320-17748-1

Receipt

The samples were received on 3/16/2016 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.7° C.

LCMS

Method(s) WS-LC-0025: The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 652286 (320-17748-1), 3228039 (320-17748-2), 87157 (320-17748-3), 669077 (320-17748-4), 87351 (320-17748-5), 522384 (320-17748-6), 522484 (320-17748-7), 87386 (320-17748-8), 87165 (320-17748-9), 92924 (320-17748-10), 87360 (320-17748-11) and 87190 (320-17748-12). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method(s) WS-LC-0025: The reporting limit for perfluoro-n-hexadecanoic acid (PFHxDA) had to be raised for the following samples due to problems with the low levels of the calibration curve. 652286 (320-17748-1), 3228039 (320-17748-2), 87157 (320-17748-3), 669077 (320-17748-4), 87351 (320-17748-5), 522384 (320-17748-6), 522484 (320-17748-7), 87386 (320-17748-8), 87165 (320-17748-9), 92924 (320-17748-10), 87360 (320-17748-11) and 87190 (320-17748-12)

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

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-103929

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

Lab Sample ID: 320-17748-1

Client Sample ID: 652286

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.0		1.8	0.41	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	6.3		1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	12		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.8		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	6.2		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.73	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.8		1.8	0.82	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	16		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	42		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 3228039

Lab Sample ID: 320-17748-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoropentanoic acid (PFPeA)	5.2		1.8	0.88	ng/L	1	-	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	5.2		1.8	0.70	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1	J	1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.8		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.62	JB	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.73	JB	1.8	0.52	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.6	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.35	J	8.9	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.72	JB	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	2.3		1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.9		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87157

Lab Sample ID: 320-17748-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.6		1.8	0.40	ng/L	1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	10		1.8	0.87	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	15		1.8	0.69	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.6		1.8	0.71	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	6.0		1.8	0.66	ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.3	J	1.8	0.58	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	1.1	JB	1.8	0.39	ng/L	1	WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.78	JB	1.8	0.52	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.8	В	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.2	J	8.8	0.11	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.84	JB	1.8	0.59	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.4		1.8	0.81	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	18		1.8	0.77	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	0.93	J	1.8	0.63	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	75		1.8	1.1	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	3.8		1.8	0.56	ng/L	1	WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Lab Sample ID: 320-17748-4

Client Sample ID: 669077

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	Method	Prep Type
Perfluorobutanoic acid (PFBA)	5.1		1.8	0.40	ng/L	1 _	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	7.1		1.8	0.87	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	12		1.8	0.69	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.9		1.8	0.70	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.9		1.8	0.66	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.54	JB	1.8	0.39	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.94	JB	1.8	0.17	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.0		1.8	0.81	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	13		1.8	0.76	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	35		1.8	1.1	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 87351

Lab Sample ID: 320-17748-5

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.9	1.8	0.41	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	3.8	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	7.5	1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.3	1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.6	1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.82 JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.72 J	9.0	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.8	1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	9.3	1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	9.5	1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 522384

Lab Sample ID: 320-17748-6

Lab Sample ID: 320-17748-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	13		1.8	0.42	ng/L	1	_	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	21		1.8	0.91	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	29		1.8	0.73	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	8.9		1.8	0.74	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	12		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.8		1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.47	JB	1.8	0.41	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.7	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	9.5		1.8	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	61		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	3.7		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	330		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 522484

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Perfluorobutanoic acid (PFBA)	12	1.8	0.42 ng/L	1 WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	28	1.8	0.91 ng/L	1 WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	31	1.8	0.72 ng/L	1 WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	9.4	1.8	0.74 ng/L	1 WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	11	1.8	0.69 ng/L	1 WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 522484 (Continued)

Lab Sample ID: 320-17748-7

Lab Sample ID: 320-17748-8

5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluorononanoic acid (PFNA)	2.3		1.8	0.60	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.76	JB	1.8	0.40	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.65	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	12		1.8	0.84	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	78		1.8	0.80	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	5.7		1.8	0.65	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	340		1.8	1.2	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 87386

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	5.0	1.8	0.41 ng/L		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	10	1.8	0.89 ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	14	1.8	0.71 ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.6	1.8	0.72 ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.5	1.8	0.68 ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.86 J	1.8	0.59 ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.73 JB	1.8	0.40 ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2 JB	1.8	0.18 ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.9	1.8	0.83 ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	17	1.8	0.79 ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	15	1.8	1.2 ng/L	1	WS-LC-0025	Total/NA
_						

Client Sample ID: 87165

Lab Sample ID: 320-17748-9

Lab Sample ID: 320-17748-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Prep Type
Perfluorobutanoic acid (PFBA)	8.3		1.8	0.42	ng/L	1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	18		1.8	0.90	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	24		1.8	0.72	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.3		1.8	0.73	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	7.5		1.8	0.68	ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	4.1		1.8	0.60	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.7	J	9.1	0.11	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	8.3		1.8	0.84	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	52		1.8	0.79	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	3.5		1.8	0.65	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	160		1.8	1.2	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 92924

Analyte	Result Qualifier	RL	MDL Un	nit Dil Fac	; D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	9.0	1.8	0.42 ng	ı/L		WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	13	1.8	0.91 ng	ı/L ·		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	20	1.8	0.72 ng	ı/L ·		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.8	1.8	0.74 ng	ı/L ·		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.6	1.8	0.69 ng	ı/L ·		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.2 J	1.8	0.60 ng	ı/L ·		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 92924 (Continued)

Lab Sample ID: 320-17748-10

Lab Sample ID: 320-17748-11

Lab Sample ID: 320-17748-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	DI	Method	Prep Type
Perfluorodecanoic acid (PFDA)	0.40	JB	1.8	0.40	ng/L	1	- 1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.0	JB	1.8	0.18	ng/L	1	١	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.62	J	9.2	0.11	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	4.6		1.8	0.84	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	23		1.8	0.80	ng/L	1	١	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	42		1.8	1.2	ng/L	1	١	WS-LC-0025	Total/NA

Client Sample ID: 87360

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.7		1.8	0.40	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	1.3	J	1.8	0.87	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	2.1		1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.89	J	1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.6		1.8	0.66	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.47	JB	1.8	0.39	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.94	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	1.8		1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.1		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 87190

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.7	1.8	0.41	ng/L	1	- 1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	5.9	1.8	0.88	ng/L	1	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	15	1.8	0.70	ng/L	1	,	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.0	1.8	0.71	ng/L	1	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.8	1.8	0.66	ng/L	1	,	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.38 JB	1.8	0.18	ng/L	1	,	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.4	1.8	0.81	ng/L	1	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	13	1.8	0.77	ng/L	1	,	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	35	1.8	1.1	ng/L	1	1	WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area

Client Sample ID: Mr 228M Date Cdlle/ te6: 03v14v1M11:27 Date Re/ ei5e6: 03v1MMM10:00

TestAmerica Job ID: 320-1774C-1
hD5 : 31-1-1173P-004

Lab Sample ID: 320-17748-1

x atMo: c ateW

Fa/	Dil Fa	Analyze6	PWapa₩a6	D		x DL	RL	QualifieW	Result	Analyte
1		03y24y1B00:2B	03y21y1B 10:2B			0d41	1dC		4.0	PeWiludWalbutandi/a/i6 (PFBA)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dC)	1dC		М3	PeWiludWilpentandi/a/i6 (PFPeA)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0ď70	1dC		12	PeWiludWilheoandi/a/i6 (PFHoA)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0ď72	1dC		2.8	PeWiludWalheptandi/a/i6 (PFHpA)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dB7	1dC		M2	PeWiludWild/tandi/a/i6 (PFOA)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dP)	1dC	Ν	0.73	PeWiludWilndnandi/a/i6 (PF9A)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0d8)	1dC		рD	j erFn oro8ecaSoic aci8 lj kDAN
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dB7	1dC		рD	jerFnoro. S8ecaSoicaci8 Ljk9SAN
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dP2	1dC		рD	jerFnoro8o8ecaSoicaci8 LjkDoAN
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0d4)	1dC		рD	j erFn orotri8ecaSoic Aci8 Lj kTriAN
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dl C	1dC	NB	1.2	PeViludVultetVil6e/ andi/ a/ i6
										(PFJeA)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0ď1 1) d0		рD	j erfn oro-S-&exa8ecaSoic aci8 Lj kHxDAN
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dB0	1dC		рD	j erfn oro-S-octaS8ecaSoic aci8 Li k6 DAN
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dC2	1dC		2.8	PeWiludWilbutane Sulfdnate (PFBS)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0ď7C	1dC		1M	PeWiludWilheoane Sulfdnate (PFHoS)
1		03y24y1B00:2B	03y21y1B 10:2B		Suy(0dB4	1dC		рD	jerFnoro-1-&eOtaSes.nfoSate LikHChN
1		03y24y1B00:2B	03y21y1B10:2B		Suy(1d1	1dC		рD	jerFnoro8ecaSes.nFoSateLjkDhN
1		03y24y1B00:2B	03y21y1B10:2B		Suy(1d1	1dC		42	PeWiludWild/ tane Sulfdnate (PFOS)
1		03y24y1B00:2B	03y21y1B10:2B		Suy(0dP7	1dC		рD	jerFnorooctaSeh.nFoSami8eLk6hAN
Fac	Dil Fa	Analyzed	Prepared				Limits	Qualifier	%Recovery	Isotope Dilution
1		03/24/16 00:26	03/21/16 10:26				25 - 150	*	8	13C8 FOSA
1		03/24/16 00:26	03/21/16 10:26				25 - 150		56	13C4 PFBA
1		03/24/16 00:26	03/21/16 10:26				25 - 150		83	13C2 PFHxA
1		03/24/16 00:26					25 - 150		88	13C4 PFOA
1		03/24/16 00:26	03/21/16 10:26				25 - 150		80	13C5 PFNA
1		03/24/16 00:26	03/21/16 10:26				25 - 150		88	13C2 PFDA
1		03/24/16 00:26					25 - 150		98	13C2 PFUnA
1		03/24/16 00:26					25 - 150		77	13C2 PFDoA
1		03/24/16 00:26					25 - 150		109	1802 PFHxS
1		03/24/16 00:26					25 - 150		108	13C4 PFOS
1		03/24/16 00:26					25 - 150		94	13C4-PFHpA
1		03/24/16 00:26					25 - 150		85	13C5 PFPeA

Client Sample ID: 322803T Date Cdlle/ te6: 03v14v1M12:14

Date Re/ ei5e6: 03v1MMM10:00

x ethd6: c S-LC-002r - PeWaludW	hate6 Hy6Wd/ aWoldns						
Analyte	Result QualifieW	RL	x DL Unit	D	P₩pa₩6	Analyze6	Dil Fa/
j erfn orob. taSoic aci8 lj kUAN	рD	1dC	0d41 Suy(03y21y1B10:2B	03y24y1B00:47	1
PeWiludWilpentandi/ a/i6 (PFPeA)	r.2	1dC	OdDC Suy(03y21y1B10:2B	03y24y1B00:47	1
PeWiludWilheoandi/ a/i6 (PFHoA)	r.2	1dC	0070 Suy(03y21y1B10:2B	03y24y1B00:47	1
PeWiludWilheptandi/ a/i6 (PFHpA)	1.1 N	1dC	0071 Suy(03y21y1B10:2B	03y24y1B00:47	1
PeWiludWild/ tandi/ a/ i6 (PFOA)	r.8	1dC	0dB7 Suy(03y21y1B10:2B	03y24y1B00:47	1
jerFnoroSoSaSoicaci8 ljkpAN	рD	1dC	0dPC Suy(03y21y1B10:2B	03y24y1B00:47	1

TestAmerica hacrameSto

x atWo: c ateW

I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area

Client Sample ID: 322803T Date Cdlle/ te6: 03v14v1M12:14 Date Re/ ei5e6: 03v1M1M10:00

TestAmerica Job ID: 320-1774C-1 hD5: 31-1-1173P-004

Lab Sample ID: 320-17748-2 x atWb: c ateW

Analyte	Result	QualifieW	RL	x DL	Unit	D	P₩/pa₩/6	Analyze6	Dil Fa/
PeViludVil6e/ andi/ a/ i6 (PFDA)	0.1/2	NB	1dC	0dB)	Suy(03y21y1B 10:2B	03y24y1B00:47	1
jerFnoro. S8ecaSoicaci8 Ljk9SAN	рD		1dC	0dB7	Suy(03y21y1B 10:2B	03y24y1B00:47	1
PeVMudVal6d6e/ andi/ a/ i6 (PFDdA)	0.73	NB	1dC	0dP2	Suy(03y21y1B 10:2B	03y24y1B00:47	1
j erfn orotri8ecaSoic Aci8 Lj kTriAN	рD		1dC	0d4)	Suy(03y21y1B 10:2B	03y24y1B00:47	1
PeVMudWutetWa6e/andi/a/i6 (PFJeA)	1.M	NB	1dC	0dl C	Suy(03y21y1B10:2B	03y24y1B00:47	
PeWiludWil-n-heoa6e/ andi/ a/ i6 (PFHoDA)	0.3r	Ν	Ca)	0ď1 1	Suy(03y21y1B10:2B	03y24y1B00:47	
PeWiludWil-n-d/tan6e/andi/a/i6 (PFODA)	0.72	NB	1dC	0 d B0	Suy(03y21y1B 10:2B	03y24y1B00:47	
erFnorob.taSeh.nFoSateljkUhN	рD		1dC	0dC2	Suy(03y21y1B10:2B	03y24y1B00:47	
Pe₩iud₩iheoane Sulfdnate (PFHoS)	2.3		1dC	0ď77	Suy(03y21y1B 10:2B	03y24y1B00:47	
jerfnoro-1-&eOtaSes.nfoSate LikHOhN	рD		1dC	0 d B3	Suy(03y21y1B10:2B	03y24y1B00:47	
erFnoro8ecaSes.nFoSateLjkDhN	рD		1dC	1ď1	Suy(03y21y1B 10:2B	03y24y1B00:47	
PeWiludWild/ tane Sulfdnate (PFOS)	1.T		1dC	1ď1	Suy(03y21y1B 10:2B	03y24y1B00:47	
jerFnorooctaSeh.nFoSami8eLk6hAN	рD		1dC	0dP7	Suy(03y21y1B 10:2B	03y24y1B00:47	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	2	*	25 - 150				03/21/16 10:26	03/24/16 00:47	
13C4 PFBA	43		25 - 150				03/21/16 10:26	03/24/16 00:47	
13C2 PFHxA	79		25 - 150				03/21/16 10:26	03/24/16 00:47	
13C4 PFOA	87		25 - 150				03/21/16 10:26	03/24/16 00:47	
13C5 PFNA	72		25 - 150				03/21/16 10:26	03/24/16 00:47	
13C2 PFDA	56		25 - 150				03/21/16 10:26	03/24/16 00:47	
13C2 PFUnA	70		25 - 150				03/21/16 10:26	03/24/16 00:47	
13C2 PFDoA	62		25 - 150				03/21/16 10:26	03/24/16 00:47	
18O2 PFHxS	122		25 - 150				03/21/16 10:26	03/24/16 00:47	
13C4 PFOS	112		25 - 150				03/21/16 10:26	03/24/16 00:47	
13C4-PFHpA	87		25 - 150				03/21/16 10:26	03/24/16 00:47	
								03/24/16 00:47	

Client Sample ID: 871r7

Date Cdlle/ te6: 03v14v1M13:00 Date Re/ ei5e6: 03v1MMM10:00

x ethd6: c S-LC-002r - PeVilludWhate6 Hy6Vill/ aVildns Analyte **Result QualifieW** RL x DL Unit D P₩/pa₩/6 Analyze6 Dil Fa/ PeWiludWilbutandi/ a/i6 (PFBA) 7.M 1dC 0040 Suy 03y21y1B 10:2B 03y24y1B 01:30 1 1dC 03y21y1B10:2B 03y24y1B01:30 PeWiludWilpentandi/ a/ i6 (PFPeA) OdC7 Suy 10 1 1dC Suv(03v21v1B10:2B 03v24v1B01:30 PeWiludWilheoandi/ a/ i6 (PFHoA) 1r 0dB) 1 1dC 03y21y1B10:2B 03y24y1B01:30 0d71 Suy(PeViludWiheptandi/ a/i6 (PFHpA) 3.M 1 PeWiludWild/tandi/ a/i6 (PFOA) MO 1dC 0dBB Suy(03y21y1B10:2B 03y24y1B01:30 1 PeWiludWilndnandi/ a/i6 (PF9A) 1.3 N 1dC 0dPC Suy(03y21y1B10:2B 03y24y1B01:30 1 PeWiludWil6e/ andi/ a/ i6 (PFDA) 1.1 NB 1dC 0dB) Suy(03y21y1B10:2B 03y24y1B01:30 1 j erFn oro. S8ecaSoic aci8 Lj k9 SAN рD 1dC 0dBB Suy 03y21y1B10:2B 03y24y1B01:30 1 03y21y1B10:2B 03y24y1B01:30 PeViludVil6d6e/ andi/ a/ i6 0.78 NB 1dC 0dP2 Suy(1 (PFDdA) 1dC 03y21y1B10:2B 03y24y1B01:30 j erFn orotri8ecaSoic Aci8 Lj kTriAN рD 0d4) Suy(1

TestAmerica hacrameSto

Lab Sample ID: 320-17748-3

x atWo: c ateW

I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area

Client Sample ID: 871r7 Date Cdlle/ te6: 03v14v1M13:00 Date Re/ ei5e6: 03v1MM10:00

TestAmerica Job ID: 320-1774C-1 hD5: 31-1-1173P-004

Lab Sample ID: 320-17748-3 x atWb: c ateW

6

Analyte	Result	QualifieW	RL	x DL	Unit	D	P₩/pa₩/6	Analyze6	Dil Fa
PeVMudWutetWa6e/andi/a/i6	1.8	В	1dC	0d1C	Suy(03y21y1B 10:2B	03y24y1B01:30	
(PFJeA)									
PeWiludWil-n-heoa6e/ andi/ a/ i6	1.2	Ν	CdC	0d1 1	Suy(03y21y1B 10:2B	03y24y1B01:30	
(PFHoDA) PeViludVil-n-d/ tan6e/ andi/ a/ i6	0.84	ND	1dC	0dP)	Sun(0202110 10.20	03v24v1B01:30	
(PFODA)	0.04	ND	Tu:	UUF)	Suy		03y2 Tyrb 10.2B	03yz4y1B01.30	
PeViludVubutane Sulfdnate (PFBS)	3.4		1dC	0dC1	Suy(03y21y1B 10:2B	03y24y1B01:30	
PeWiludWilheoane Sulfdnate	18		1dC	0ď77	Suy(03y21y1B 10:2B	03y24y1B01:30	
(PFHoS)							-	-	
PeWiludWil-1-heptanesulfdnate	0.T3	Ν	1dC	0dB3	Suy(03y21y1B 10:2B	03y24y1B01:30	
(PFHpS)	_		1.5		o (
jerFnoro8ecaSes.nFoSateljkDhN	рD		1dC	1ď	Suy(03y24y1B01:30	
PeWiludWild/ tane Sulfdnate (PFOS)	7r		1dC	1ď	Suy(5 5	03y24y1B01:30	
PeWiludWild/ tane Sulfdnami6e	3.8		1dC	0dPB	Suy(03y21y1B 10:2B	03y24y1B01:30	
(FOSA)									
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	5	*	25 - 150					03/24/16 01:30	
13C4 PFBA	46		25 - 150					03/24/16 01:30	
13C2 PFHxA	74		25 - 150					03/24/16 01:30	
13C4 PFOA	80		25 - 150					03/24/16 01:30	
13C5 PFNA	66		25 - 150					03/24/16 01:30	
13C2 PFDA	62		25 - 150					03/24/16 01:30	
13C2 PFUnA	59		25 - 150					03/24/16 01:30	
13C2 PFDoA	51		25 - 150					03/24/16 01:30	
1802 PFHxS	105		25 - 150					03/24/16 01:30	
13C4 PFOS	103		25 - 150				03/21/16 10:26	03/24/16 01:30	
	94		25 - 150				03/21/16 10:26	03/24/16 01:30	
13C4-PFHpA	34		20 - 100						

Client Sample ID: MMT077 Date Cdlle/ te6: 03v14v1M14:14 Date Re/ ei5e6: 03v1MrM10:00

x ethd6: c S-LC-002r - PeViludWhate6 Hy6Vil/ aVidns Analyte **Result QualifieW** RL x DL Unit D PWepaWe6 Analyze6 Dil Fa/ 1dC 0d10 Suv 03y21y1B10:2B 03y24y1B01:P1 PeWiludWilbutandi/ a/ i6 (PFBA) r.1 1 PeWiludWilpentandi/ a/ i6 (PFPeA) 7.1 1dC OdC7 Suy(03y21y1B10:2B 03y24y1B01:P1 1 PeWiludWilheoandi/ a/i6 (PFHoA) 12 1dC 0dB) Suv(03y21y1B10:2B 03y24y1B01:P1 1 1dC 0070 Suy(03y21y1B10:2B 03y24y1B01:P1 PeWiludWilheptandi/ a/i6 (PFHpA) 2.T 1 1dC 03y21y1B10:2B 03y24y1B01:P1 PeWiludWild/ tandi/ a/ i6 (PFOA) 3.T 0dBB Suy(1 1dC 03y21y1B10:2B 03y24y1B01:P1 j erFn oroSoSaSoic aci8 Lj kpAN 0dP7 Suy(1 рD 1dC 0cB) Suv(03v21v1B10:2B 03v24v1B01:P1 PeViludVil6e/ andi/ a/ i6 (PFDA) 0.r4 NB 1 1dC 03y21y1B10:2B 03y24y1B01:P1 j erFn oro. S8ecaSoic aci8 Lj k9 SAN 0dBB Suy(рD 1 j erFn oro8o8ecaSoic aci8 Lj k DoAN рD 1dC 0dP1 Suy 03y21y1B10:2B 03y24y1B01:P1 1 j erFn orotri8ecaSoic Aci8 Lj kTriAN рD 1dC 0d4C Suy(03y21y1B10:2B 03y24y1B01:P1 1 PeWiludWiltetWil6e/ andi/ a/ i6 0.T4 NB 1dC 0d17 Suy(03y21y1B10:2B 03y24y1B01:P1 1 (PFJeA) j erFn oro-S-&exa8ecaSoic aci8 рD CdC Odl1 Suy 03y21y1B10:2B 03y24y1B01:P1 1 Lį kHxDAN 0dP) Suy(1dC 03y21y1B10:2B 03y24y1B01:P1 рD 1 j erFn oro-S-octaS8ecaSoic aci8 Li k6 DAN 03y21y1B10:2B 03y24y1B01:P1 1dC OdC1 Suy PeWiludWibutane Sulfdnate (PFBS) 1 3.0

TestAmerica hacrameSto

Lab Sample ID: 320-17748-4

x atWo: c ateW

I nieSt: h &aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area

x ethd6: c S-LC-002r - PeVMudWhate6 Hv6Wd/ aWddns (Cdntinue6)

Client Sample ID: MMF077 Date Cdlle/ te6: 03v14v1M14:14 Date Re/ ei5e6: 03v1MMM10:00

TestAmerica Job ID: 320-1774C-1 hD5:31-1-1173P-004

Lab Sample ID: 320-17748-4 x atMo: c ateW

6

Analyte		QualifieW	RL	x DL	Unit	D	PWapa₩a6	Analyze6	Dil Fa/
PeWiludWilheoane Sulfdnate	13		1dC	0ď7B	Suy(_	03y21y1B 10:2B	03y24y1B01:P1	1
(PFHoS)									
j erFn oro-1-&eOtaSes. nFoSate	рD		1dC	0dB3	Suy(03y21y1B 10:2B	03y24y1B01:P1	1
lj kHChN			4.0	4.8	0(00.04.45.40.05	00.04.40.04.04	
jerFnoro8ecaSes.nFoSateljkDhN	рD		1dC		Suy(03y24y1B01:P1	1
PeWiludWild/ tane Sulfdnate (PFOS)	3r		1dC	1ď1	Suy(03y21y1B 10:2B	03y24y1B01:P1	1
jerFnorooctaSeh.nFoSami8eLk6hAN	рD		1dC	0dPB	Suy(03y21y1B 10:2B	03y24y1B01:P1	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	13	*	25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C4 PFBA	60		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C2 PFHxA	86		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C4 PFOA	90		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C5 PFNA	86		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C2 PFDA	80		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C2 PFUnA	99		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C2 PFDoA	74		25 - 150				03/21/16 10:26	03/24/16 01:51	1
18O2 PFHxS	117		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C4 PFOS	109		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C4-PFHpA	98		25 - 150				03/21/16 10:26	03/24/16 01:51	1
13C5 PFPeA	79		25 - 150				03/21/16 10:26	03/24/16 01:51	1

Client Sample ID: 873r1 Date Cdlle/ te6: 03v14v1M0T:30 Date Re/ ei5e6: 03v1MMM10:00

x ethd6: c S-LC-002r - PeViludWhate6 Hy6Vil/ aVidns **Result QualifieW** RL x DL Unit PWepaWe6 Analyte D Analyze6 Dil Fa/ 1dC 0d#1 Suv(03v21v1B10:2B 03v24v1B02:12 PeWiludWilbutandi/ a/i6 (PFBA) 3.T 1 PeWiludWilpentandi/ a/ i6 (PFPeA) 3.8 1dC 0dC) Suy(03y21y1B10:2B 03y24y1B02:12 1 PeWiludWilheoandi/ a/i6 (PFHoA) 7.r 1dC 0d71 Suy(03y21y1B10:2B 03y24y1B02:12 1 1dC 03y21y1B10:2B 03y24y1B02:12 PeWiludWilheptandi/ a/i6 (PFHpA) 2.3 0ď72 Suy(1 PeWiludWild/ tandi/ a/ i6 (PFOA) 1dC 0dB7 Suy(03y21y1B10:2B 03y24y1B02:12 3.M 1 рD 1dC 03y21y1B10:2B 03y24y1B02:12 j erFn oroSoSaSoic aci8 Lj kpAN 0dP) Suv 1 рD j erFn oro8ecaSoic aci8 Lj kDAN 1dC 0d40 Suv(03y21y1B10:2B 03y24y1B02:12 1 1dC 03y21y1B10:2B 03y24y1B02:12 j erFn oro. S8ecaSoic aci8 Lj k9 SAN рD 0dB7 Suv(1 03y21y1B10:2B 03y24y1B02:12 j erFn oro8o8ecaSoic aci8 Lj kDoAN рD 1dC 0dP3 Suy 1 j erFn orotri8ecaSoic Aci8 Lj kTriAN рD 1ďC 0dP0 Suv(03y21y1B10:2B 03y24y1B02:12 1 03y21y1B10:2B 03y24y1B02:12 PeWiludWiltetWil6e/ andi/ a/ i6 0.82 NB 1dC OdIC Suy 1 (PFJeA)) dD 0d11 Suy(03y21y1B10:2B 03y24y1B02:12 PeWiludWil-n-heoa6e/ andi/ a/ i6 0.72 N 1 (PFHoDA) 0dB0 Suy(1dC 03y21y1B10:2B 03y24y1B02:12 j erFn oro-S-octaS8ecaSoic aci8 рD 1 Lj k6 DAN PeWiludWilbutane Sulfdnate (PFBS) 1ďC 03y21y1B10:2B 03y24y1B02:12 1.8 OdC3 Suy 1 PeWiludWilheoane Sulfdnate **T.3** 1dC 0d7C Suy 03y21y1B10:2B 03y24y1B02:12 1 (PFHoS) рD 1dC 0dB4 Suy(03y21y1B10:2B 03y24y1B02:12 1 j erFn oro-1-&eOtaSes. nFoSate Lj k HCh N jerFnoro8ecaSes.nFoSateLjkDhN рD 1dC 1dl Suv(03y21y1B10:2B 03y24y1B02:12 1 1dC 03y21y1B10:2B 03y24y1B02:12 PeWiludWild/ tane Sulfdnate (PFOS) T.r 1ď Suy(1 jerFnorooctaSeh.nFoSami8eLk6hAN рD 1ďC 0dP7 Suy 03y21y1B10:2B 03y24y1B02:12 1

TestAmerica hacrameSto

Lab Sample ID: 320-17748-r

x atMo: c ateW

Limits

25 - 150

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I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFk airbaSgs kire TraiSiSu Area

%Recovery Qualifier

3 *

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Client Sample ID: 873r 1 Date Cdlle/ te6: 03vl4vlM0T:30 Date Re/ ei5e6: 03vlMvl10:00

Isotope Dilution

13C8 FOSA

13C4 PFBA

13C2 PFHxA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA

13C2 PFDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

Client Sample ID: r 22384

Date Cdlle/ te6: 03v14v1M10:30

Date Re/ ei5e6: 03v1MMM10:00

03/21/16 10:26 03/24/16 02:12

03/21/16 10:26 03/24/16 02:12

03/21/16 10:26 03/24/16 02:12

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03/21/16 10:26 03/24/16 02:12

03/21/16 10:26 03/24/16 02:12

03/21/16 10:26 03/24/16 02:12

Prepared

Lab Sample ID: 320-17748-r x atWb: c ateW

Analyzed

> 13 14

Dil Fac

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Lab Sample ID: 320-17748-M

xatWo:cateW

Analyte	Result	QualifieW	RL	x DL	Unit	D	P₩/pa₩/6	Analyze6	Dil Fa/
PeWiludWubutandi/a/i6 (PFBA)	13		1dC	0d42	Suy(03y21y1B 10:2B	03y24y1B02:34	1
PeWiludWilpentandi/a/i6 (PFPeA)	21		1dC	0 d) 1	Suy(03y21y1B 10:2B	03y24y1B02:34	1
PeWiludWilheoandi/a/i6 (PFHoA)	2T		1dC	0d73	Suy(03y21y1B 10:2B	03y24y1B02:34	1
PeWiludWaheptandi/a/i6 (PFHpA)	8.T		1dC	0ď74	Suy(03y21y1B 10:2B	03y24y1B02:34	1
PeWiludWild/tandi/a/i6 (PFOA)	12		1dC	0 d B)	Suy(03y21y1B 10:2B	03y24y1B02:34	1
PeViludVulndnandi/a/i6 (PF9A)	2.8		1dC	0dB0	Suy(03y21y1B 10:2B	03y24y1B02:34	1
PeWiludWil6e/ andi/ a/ i6 (PFDA)	0.47	NB	1dC	0d41	Suy(03y21y1B 10:2B	03y24y1B02:34	1
jerFnoro. S8ecaSoicaci8 Ljk9SAN	рD		1dC	0 d B)	Suy(03y21y1B 10:2B	03y24y1B02:34	1
j erFn oro8o8ecaSoic aci8 Lj kDoAN	рD		1dC	0dP4	Suy(03y21y1B 10:2B	03y24y1B02:34	1
j erFn orotri8ecaSoic Aci8 Lj kTriAN	рD		1dC	0dP1	Suy(03y21y1B 10:2B	03y24y1B02:34	1
PeVMudWultetWa/6e/andi/a/i6 (PFJeA)	1.7	NB	1 c C	0dl C	Suy(03y21y1B10:2B	03y24y1B02:34	1
j erFn oro-S-&exa8ecaSoic aci8 Lj kHxDAN	рD) d2	0d1 1	Suy(03y21y1B10:2B	03y24y1B02:34	1
j erFn oro-S-octaS8ecaSoic aci8 Lj k6 DAN	рD		1dC	0dB2	Su <u>)(</u>		03y21y1B 10:2B	03y24y1B02:34	1
PeWiludWilbutane Sulfdnate (PFBS)	T.r		1dC	0dCP	Suy(03y21y1B10:2B	03y24y1B02:34	1
PeViludVilheoane Sulfdnate (PFHoS)	MI		1dC	0 d D0	Su <u>)(</u>		03y21y1B 10:2B	03y24y1B02:34	1
PeWiludWil-1-heptanesulfdnate (PFHpS)	3.7		1dC	0dBB			03y21y1B10:2B	03y24y1B02:34	1
jerFnoro8ecaSes.nFoSateLjkDhN	рD		1dC	1ď	Suy(03y21y1B 10:2B	03y24y1B02:34	1
PeWiludWild/ tane Sulfdnate (PFOS)	330		1dC	1d2	Suy(03y21y1B 10:2B	03y24y1B02:34	1
jerFnorooctaSeh.nFoSami8eLk6hAN	рD		1dC	0dP)	Suy(03y21y1B 10:2B	03y24y1B02:34	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	3	*	25 - 150				03/21/16 10:26	03/24/16 02:34	1
13C4 PFBA	39		25 - 150				03/21/16 10:26	03/24/16 02:34	1
13C2 PFHxA	80		25 - 150				03/21/16 10:26	03/24/16 02:34	1
13C4 PFOA	98		25 - 150				03/21/16 10:26	03/24/16 02:34	1
13C5 PFNA	70		25 - 150				03/21/16 10:26	03/24/16 02:34	1
13C2 PFDA	71		25 - 150				03/21/16 10:26	03/24/16 02:34	1
13C2 PFUnA	74		25 - 150				03/21/16 10:26	03/24/16 02:34	1
13C2 PFDoA	68		25 - 150				03/21/16 10:26	03/24/16 02:34	1

I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area

Client Sample ID: r 22384 Date Cdlle/ te6: 03v14v1M10:30 Date Re/ ei5e6: 03v1MMM10:00

x ethd6: c S-LC-002r -	PeWiludWhate6 Hy6Wil/ aWidns	s (Cdntinue6)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	115	25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C4 PFOS	97	25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C4-PFHpA	96	25 - 150	03/21/16 10:26	03/24/16 02:34	1
13C5 PFPeA	70	25 - 150	03/21/16 10:26	03/24/16 02:34	1

Client Sample ID: r 22484 Date Cdlle/ te6: 03v14v1M10:20 Date Re/ ei5e6: 03v1MMM10:00

TestAmerica Job ID: 320-1774C-1 hD5:31-1-1173P-004

Lab Sample ID: 320-17748-M x atMo: c ateW

Lab Sample ID: 320-17748-7 x atWo: c ateW

3

5

6

x ethd6: c S-LC-002r - Pe <mark>Wi</mark> lud Analyte		QualifieW	RL	x DL	Unit	D	PWapa₩a6	Analyze6	Dil Fa/
PeWiludWilbutandi/a/i6 (PFBA)	12		1dC	0d42	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
PeWiludWilpentandi/a/i6 (PFPeA)	28		1dC	0d) 1	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
PeWiludWilheoandi/a/i6 (PFHoA)	31		1dC	0ď72	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
PeWiludWilheptandi/a/i6 (PFHpA)	T.4		1dC	0ď74	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
PeWiludWild/tandi/a/i6 (PFOA)	11		1dC	0dB)	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
PeWiludWalndnandi/a/i6 (PF9A)	2.3		1dC	0dB0	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
PeWiludWil6e/ andi/ a/ i6 (PFDA)	0.7M	NB	1dC	0d40	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
erfn oro. S8ecaSoic aci8 Lj k9 SAN	рD		1dC	0 d B)	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
erFn oro8o8ecaSoic aci8 Lj kDoAN	рD		1dC	0dP4	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
erFn orotri8ecaSoic Aci8 Lj kTriAN	рD		1dC	0dP1	Suy(03y21y1B 10:2B	03y24y1B02:PP	1
PeVMudValtetVal6e/andi/a/i6 (PFJeA)	0.Mr	NB	1dC	0d1C	Suy(03y21y1B10:2B	03y24y1B02:PP	1
erfn oro-S-&exa8ecaSoic aci8 j k HxDAN	рD) d2	0di 1	Suy(03y21y1B10:2B	03y24y1B02:PP	1
erদ্য oro-S-octaS8ecaSoic aci8 į k6 DAN	рD		1dC	0dB2	Suy(03y21y1B10:2B	03y24y1B02:PP	
PeWiludWilbutane Sulfdnate (PFBS)	12		1dC	0dC4	Suy(03y21y1B10:2B	03y24y1B02:PP	
PeWiludWilheoane Sulfdnate PFHoS)	78		1dC	0dD0			03y21y1B10:2B	03y24y1B02:PP	
PeWiludWil-1-heptanesulfdnate PFHpS)	r.7		1dC	0dBP				03y24y1B02:PP	
erFnoro8ecaSes.nFoSateLjkDhN	рD		1dC		Suy(03y21y1B10:2B	03y24y1B02:PP	
PeViludVild/ tane Sulfdnate (PFOS)	340		1dC		Suy(03y21y1B 10:2B	03y24y1B02:PP	
erFnorooctaSeh.nFoSami8eLk6hAN	рD		1dC	0dP)	Suy(03y21y1B10:2B	03y24y1B02:PP	
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
3C8 FOSA	8	*	25 - 150				03/21/16 10:26	03/24/16 02:55	
3C4 PFBA	42		25 - 150				03/21/16 10:26	03/24/16 02:55	
3C2 PFHxA	75		25 - 150				03/21/16 10:26	03/24/16 02:55	
13C4 PFOA	81		25 - 150				03/21/16 10:26	03/24/16 02:55	-
13C5 PFNA	62		25 - 150				03/21/16 10:26	03/24/16 02:55	
13C2 PFDA	56		25 - 150				03/21/16 10:26	03/24/16 02:55	
3C2 PFUnA	63		25 - 150				03/21/16 10:26	03/24/16 02:55	
3C2 PFDoA	63		25 - 150				03/21/16 10:26	03/24/16 02:55	
1802 PFHxS	112		25 - 150				03/21/16 10:26	03/24/16 02:55	
13C4 PFOS	89		25 - 150				03/21/16 10:26	03/24/16 02:55	
13C4-PFHpA	88		25 - 150				03/21/16 10:26	03/24/16 02:55	
13C5 PFPeA	69		25 - 150					03/24/16 02:55	

I nieSt: h &aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area

Client Sample ID: 8738M Date Cdlle/ te6: 03v14v1M11:10 Date Re/ ei5e6: 03v1MM10:00

PeWiludWubutandi/ a/i6 (PFBA)

PeWiludWilpentandi/ a/ i6 (PFPeA)

PeWiludWilheoandi/ a/ i6 (PFHoA)

PeWiludWiheptandi/ a/i6 (PFHpA)

PeViludWild/ tandi/ a/ i6 (PFOA)

j erFn orotri8ecaSoic Aci8 Lj kTriAN

PeWiludWitetWi6e/ andi/ a/ i6

j erFn oro-S-&exa8ecaSoic aci8

j erFn oro-S-octaS8ecaSoic aci8

PeWiludWilheoane Sulfdnate

j erFn oro-1-&eOtaSes. nFoSate

jerFnoro8ecaSes.nFoSateLjkDhN

PeWiludWild/ tane Sulfdnate (PFOS)

jerFnorooctaSeh.nFoSami8eLk6hAN

PeWiludWilbutane Sulfdnate (PFBS)

Analyte

(PFJeA)

Li k HxDAN

Li k6 DAN

(PFHoS)

LikHChN

Isotope Dilution

13C8 FOSA

13C4 PFBA

13C2 PFHxA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA 13C2 PFDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

TestAmerica Job ID: 320-1774C-1 hD5:31-1-1173P-004

Lab Sample ID: 320-17748-8 x atMo: c ateW

03y21y1B 10:2B 03y24y1B 03:1B

03y21y1B10:2B 03y24y1B03:1B

Analyze6

Dil Fa/

1

1

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1

1

1

1

1

1

5
6
8
9

		9
		2
1	1	3

1	

03y21y1B 10:2B	03y24y1B03:1B	1	
• •	03y24y1B03:1B 03y24y1B03:1B	1 1	1
03y21y1B 10:2B	03y24y1B03:1B	1	

03y21y1B10:2B 03y24y1B 03y21y1B10:2B 03y24y1B03:1B 03y21y1B10:2B 03y24y1B03:1B 1 03y21y1B10:2B 03y24y1B03:1B

Prepared	Analyzed	Dil Fac
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1
03/21/16 10:26	03/24/16 03:16	1

Client Sample ID: 871Mr Date Cdlle/ te6: 03v14v1M13:0M Date Re/ ei5e6: 03v1M/M10:00

x ethd6: c S-LC-002r - PeWaudW	Mate6 Hy6Wd/ aWddns							
Analyte	Result QualifieW	RL	x DL	Unit	D	P₩/pa₩/6	Analyze6	Dil Fa/
PeWiludWilbutandi/a/i6 (PFBA)	8.3	1dC	0d42	Suy(03y21y1B 10:2B	03y24y1B03:37	1
PeWiludWilpentandi/a/i6 (PFPeA)	18	1dC	0 d) 0	Suy(03y21y1B 10:2B	03y24y1B03:37	1
PeWiludWilheoandi/a/i6 (PFHoA)	24	1dC	0ď72	Suy(03y21y1B 10:2B	03y24y1B03:37	1
PeWiludWilheptandi/a/i6 (PFHpA)	7.3	1dC	0 7 3	Suy(03y21y1B 10:2B	03y24y1B03:37	1
PeWiludWild/tandi/a/i6 (PFOA)	7.r	1dC	0dBC	Suy(03y21y1B 10:2B	03y24y1B03:37	1
PeWiludWalndnandi/a/i6 (PF9A)	4.1	1dC	0 d B0	Suy(03y21y1B 10:2B	03y24y1B03:37	1
j erFn oro8ecaSoic aci8 Lj kDAN	рD	1dC	0d40	Suy(03y21y1B 10:2B	03y24y1B03:37	1

TestAmerica hacrameSto

1dC

1dC

1dC

1dC

1dC

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25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

x DL Unit

0071 Suy

0d72 Suy(

0 dBC Suy(

0d40 Suy(

0 dBC Suv(

0dP3 Suy(

0dP0 Suy(

OdIC Suy

Odl1 Suy

0dB1 Suv(

OdC3 Suy

0d7) Suy(

0dB4 Suy(

1dl Suy

1d2 Suy(

0 dPC Suy

Suy(

0d41 Suv

0dC)

(900 Suv D

PWgpaWg6

x atWo: c ateW

Lab Sample ID: 320-17748-T

x ethd6: c S-LC-002r - PeViludWhate6 Hy6Vil/ aWidns Result QualifieW RI 1dC r.0

10

14

4.M

r.r

рD

рD

рD

2.T

17

рD

рD

1r

рD

%Recovery Qualifier

1

46

84

88

84

56

75

57

120

104

86

71

1.2 NB

PeViludWindnandi/ a/ i6 (PF9A) 0.8M N PeWiludWil6e/ andi/ a/ i6 (PFDA) 0.73 NB j erFn oro. S8ecaSoic aci8 Lj k9 SAN рD рD j erFn oro8o8ecaSoic aci8 lj kDoAN

I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFk airbaSgs kire TraiSiSu Area

Client Sample ID: 871Mr Date Cdlle/ te6: 03v14v1M13:0M Date Re/ ei5e6: 03v1MrM10:00

TestAmerica Job ID: 320-1774C-1 hD5: 31-1-1173P-004

Lab Sample ID: 320-17748-T x atWb: c ateW

5 6 7

Analyte	Result	QualifieW	RL	x DL	Unit	D	P₩/pa₩/6	Analyze6	Dil Fa
erFn oro. S8ecaSoic aci8 Lj k9 SAN	рD		1dC	0dBC	Suy(03y21y1B10:2B	03y24y1B03:37	
erFn oro8o8ecaSoic aci8 Lj kDoAN	рD		1dC	0dP3	Suy(03y21y1B10:2B	03y24y1B03:37	
erFn orotri8ecaSoic Aci8 Lj kTriAN	рD		1dC	0dP0	Suy(03y21y1B10:2B	03y24y1B03:37	
PeViludVultetVul6e/andi/a/i6 (PFJeA)	1.2	NB	1dC	0dl C	Suy(03y21y1B10:2B	03y24y1B03:37	
PeWiludWil-n-heoa6e/ andi/ a/ i6 (PFHoDA)	2.7	Ν) đi	0ď 1	Suy(03y21y1B10:2B	03y24y1B03:37	
erদ্য oro-S-octaS8ecaSoic aci8 j k6DAN	рD		1dC	0dB1	Suy(03y21y1B10:2B	03y24y1B03:37	
PeWiludWilbutane Sulfdnate (PFBS)	8.3		1dC	0dC4	Suy(03y21y1B10:2B	03y24y1B03:37	
PeWiludWilheoane Sulfdnate PFHoS)	r 2		1dC	0ď7)	Suy(03y21y1B10:2B	03y24y1B03:37	
PeWiludWil-1-heptanesulfdnate PFHpS)	3.r		1dC	0dBP	Suy(03y21y1B10:2B	03y24y1B03:37	
erFnoro8ecaSes.nFoSateLjkDhN	рD		1dC	1ď1	Suy(03y21y1B10:2B	03y24y1B03:37	
PeViludVild/ tane Sulfdnate (PFOS)	1 M D		1dC	1d2	Suy(03y21y1B 10:2B	03y24y1B03:37	
erFoorooctaSeh.nFoSami8eLk6hAN	рD		1dC	0dPC	Suy(03y21y1B 10:2B	03y24y1B03:37	
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	5	*	25 - 150				03/21/16 10:26	03/24/16 03:37	
13C4 PFBA	46		25 - 150				03/21/16 10:26	03/24/16 03:37	
3C2 PFHxA	85		25 - 150				03/21/16 10:26	03/24/16 03:37	
3C4 PFOA	85		25 - 150				03/21/16 10:26	03/24/16 03:37	
I3C5 PFNA	48		25 - 150				03/21/16 10:26	03/24/16 03:37	
3C2 PFDA	41		25 - 150				03/21/16 10:26	03/24/16 03:37	
3C2 PFUnA	42		25 - 150				03/21/16 10:26	03/24/16 03:37	
3C2 PFDoA	47		25 - 150				03/21/16 10:26	03/24/16 03:37	
802 PFHxS	112		25 - 150				03/21/16 10:26	03/24/16 03:37	
3C4 PFOS	102		25 - 150				03/21/16 10:26	03/24/16 03:37	
I3C4-PFHpA	94		25 - 150				03/21/16 10:26	03/24/16 03:37	
13C5 PFPeA	72		25 - 150				03/21/16 10:26	03/24/16 03:37	

Client Sample ID: T2T24 Date Cdlle/ te6: 03v14v1M14:0r Date Re/ ei5e6: 03v1Mv1M10:00

Lab Sample ID: 320-17748-10 x atWb: c ateW

Analyte	Result	QualifieW	RL	x DL	Unit	D	P₩/pa₩/6	Analyze6	Dil Fa/
PeWiludWilbutandi/a/i6 (PFBA)	T.0		1dC	0d#2	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
PeWiludWilpentandi/a/i6 (PFPeA)	13		1dC	0d) 1	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
PeWiludWilheoandi/a/i6 (PFHoA)	20		1dC	0ď72	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
PeWiludWilheptandi/a/i6 (PFHpA)	4.8		1dC	0ď74	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
PeWiludWild/tandi/a/i6 (PFOA)	4.M		1dC	0dB)	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
PeWiludWandnandi/a/i6 (PF9A)	1.2	Ν	1dC	0dB0	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
PeWiludWil6e/ andi/ a/ i6 (PFDA)	0.40	NB	1dC	0d40	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
erFn oro. S8ecaSoic aci8 Lj k9SAN	рD		1dC	0dB)	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
j erFn oro8o8ecaSoic aci8 Lj kDoAN	рD		1dC	0dP4	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
j erFn orotri8ecaSoic Aci8 lj kTriAN	рD		1ďC	0dP1	Suy(03y21y1B 10:2B	03y24y1B03:P)	1
PeWiludWitetWi6e/andi/a/i6 (PFJeA)	1.0	NB	1dC	0dl C	Su <u>y</u> (03y21y1B 10:2B	03y24y1B03:P)	1
PeWiludWil-n-heoa6e/andi/a/i6 (PFHoDA)	0.M2	Ν) d2	0dl 1	Su)(03y21y1B10:2B	03y24y1B03:P)	1

RL

1dC

1dC

1dC

1dC

1dC

1dC

1dC

Limits

25 - 150

25 - 150

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25 - 150

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25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

x DL Unit

0dB2 Suy

OdC4 Suy

OdDO Suy

0dBB Suy(

1d1 Suy(

102 Suy(

0dP) Suy(

D

PWepaWe6

Prepared

I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area

x ethd6: c S-LC-002r - PeVMudWhate6 Hy6Wu/ aWudns (Cdntinue6)

Result QualifieW

pD

4.M

23

рD

рD

42

рD

4

47

75

97

62

45

57

56

112

111

86

82

Qualifier

%Recovery

Client Sample ID: T2T24 Date Cdlle/ te6: 03v14v1M14:0r Date Re/ ei5e6: 03v1MM10:00

PeWiludWilbutane Sulfdnate (PFBS)

j erFn oro-S-octaS8ecaSoic aci8

PeWiludWilheoane Sulfdnate

j erFn oro-1-&eOtaSes. nFoSate

jerFnoro8ecaSes.nFoSateLjkDhN

PeWiludWild/ tane Sulfdnate (PFOS)

jerFnorooctaSeh.nFoSami8eLk6hAN

Analyte

Li k6 DAN

(PFHoS)

LikHChN

Isotope Dilution

13C8 FOSA

13C4 PFBA

13C2 PFHxA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA

13C2 PFDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

TestAmerica Job ID: 320-1774C-1 hD5: 31-1-1173P-004

Lab Sample ID: 320-17748-10 x atWb: c ateW

03y21y1B10:2B 03y24y1B03:P)

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

03/21/16 10:26 03/24/16 03:59

Analyze6

Analyzed

Dil Fa/

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1

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1

1

1

1

Dil Fac

03/21/16 10:26 03/24/16 03:59 1 Lab Sample ID: 320-17748-11

x atWo: c ateW

Client Sample ID: 873MD Date Cdlle/ te6: 03v14v1M17:48 Date Re/ ei5e6: 03v1Mv1M10:00

x ethd6: c S-LC-002r - PeViludW Analyte		QualifieW	RL	x DL	Unit	D	PWapa₩a6	Analyze6	Dil Fa/
PeWiludWilbutandi/ a/ i6 (PFBA)	2.7		1dC	0d40	Suy(03y21y1B 10:2B	03y24y1B04:20	1
PeWiludWilpentandi/ a/ i6 (PFPeA)	1.3	Ν	1dC	0dC7	Suy(03y21y1B 10:2B	03y24y1B04:20	1
PeWiludWilheoandi/ a/i6 (PFHoA)	2.1		1dC	0 B)	Suy(03y21y1B 10:2B	03y24y1B04:20	1
PeWiludWiheptandi/ a/ i6 (PFHpA)	0.8T	Ν	1dC	0ď71	Suy(03y21y1B 10:2B	03y24y1B04:20	1
PeWiludWild/tandi/a/i6 (PFOA)	2.M		1dC	0dBB	Suy(03y21y1B 10:2B	03y24y1B04:20	1
jerFnoroSoSaSoicaci8 LjkpAN	рD		1dC	0dPC	Suy(03y21y1B 10:2B	03y24y1B04:20	1
PeWiludWil6e/ andi/ a/ i6 (PFDA)	0.47	NB	1dC	0 c B)	Suy(03y21y1B 10:2B	03y24y1B04:20	1
jerFnoro. S8ecaSoicaci8 Ljk9 SAN	рD		1dC	0dBB	Suy(03y21y1B 10:2B	03y24y1B04:20	1
j erFn oro8o8ecaSoic aci8 lj kDoAN	рD		1dC	0dP2	Suy(03y21y1B 10:2B	03y24y1B04:20	1
j erFn orotri8ecaSoic Aci8 Lj kTriAN	рD		1dC	0œ4)	Suy(03y21y1B 10:2B	03y24y1B04:20	1
PeWiludWiltetWil6e/andi/a/i6	0.T4	NB	1dC	0d1C	Suy(03y21y1B 10:2B	03y24y1B04:20	1
(PFJeA)									
j erfn oro-S-&exa8ecaSoic aci8	рD		CdC	0ď1 1	Suy(03y21y1B 10:2B	03y24y1B04:20	1
lj kHxDAN	_				. .				
j erFn oro-S-octaS8ecaSoic aci8 Li k6 DAN	рD		1dC	0dP)	Suy		03y21y1B 10:2B	03y24y1B04:20	1
jerFn.orob.taSeh.nFoSateLjkUhN	рD		1dC	0dC1	Suy(03y21y1B 10:2B	03y24y1B04:20	1
PeWiludWilheoane Sulfdnate (PFHoS)	1.8		1dC	0ď7	Su <u>y</u> (03y21y1B10:2B	03y24y1B04:20	1
jerfnoro-1-&eOtaSes.nfoSate LjkHOhN	рD		1dC	0dB3	Suy(03y21y1B 10:2B	03y24y1B04:20	1

I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area

Client Sample ID: 873MD Date Cdlle/ te6: 03v14v1M17:48 Date Re/ ei5e6: 03v1M1M10:00

TestAmerica Job ID: 320-1774C-1 hD5 : 31-1-1173P-004

Lab Sample ID: 320-17748-11 x atWb: c ateW

Lab Sample ID: 320-17748-12

ateW

Analyte	Result	QualifieW	RL	x DL	Unit	D	PWe/pa₩e/6	Analyze6	Dil Fa/
jerFnoro8ecaSes.nFoSateLjkDhN	рD		1dC	1ď	Suy(03y21y1B10:2B	03y24y1B04:20	1
PeWiludWild/ tane Sulfdnate (PFOS)	2.1		1dC	1ď1	Suy(03y21y1B10:2B	03y24y1B04:20	1
jerFnorooctaSeh.nfoSami8elk6hAN	рD		1dC	0dPB	Suy(03y21y1B 10:2B	03y24y1B04:20	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	3	*	25 - 150				03/21/16 10:26	03/24/16 04:20	
13C4 PFBA	64		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C2 PFHxA	87		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C4 PFOA	85		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C5 PFNA	83		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C2 PFDA	73		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C2 PFUnA	88		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C2 PFDoA	86		25 - 150				03/21/16 10:26	03/24/16 04:20	
18O2 PFHxS	112		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C4 PFOS	111		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C4-PFHpA	85		25 - 150				03/21/16 10:26	03/24/16 04:20	
13C5 PFPeA	82		25 - 150				03/21/16 10:26	03/24/16 04:20	

Client Sample ID: 871T0 Date Cdlle/ te6: 03v14v1M18:28 Date Re/ ei5e6: 03v1M1M10:00

x ethd6: c S-LC-002r - PeViludWhate6 Hy6Vil/ aWidns Analyte Result QualifieW RL x DL Unit P₩/pa₩/6 Analyze6 D Dil Fa/ 1dC 4.7 0d41 Suy 03y21y1B 10:2B 03y24y1B 04:41 PeWiludWilbutandi/ a/ i6 (PFBA) 1 PeWiludWilpentandi/ a/ i6 (PFPeA) r.T 1dC OdDC Suy 03y21y1B10:2B 03y24y1B04:41 1 PeWiludWilheoandi/ a/ i6 (PFHoA) 1dC 0070 Suy 03y21y1B10:2B 03y24y1B04:41 1r 1 PeWiludWilheptandi/ a/ i6 (PFHpA) 1dC 0ď71 Suv(03y21y1B10:2B 03y24y1B04:41 1 3.0 3.8 0dBB Suy 03y21y1B10:2B 03y24y1B04:41 PeWiludWild/tandi/ a/i6 (PFOA) 1 dC1 03y21y1B10:2B 03y24y1B04:41 j erFn oroSoSaSoic aci8 Lj kpAN рD 1dC 0 dPC Suy 1 j erFn oro8ecaSoic aci8 Lj kDAN 1dC 0dB) Suy(03y21y1B10:2B 03y24y1B04:41 рD 1 0dBB Suy(03y21y1B10:2B 03y24y1B04:41 j erFn oro. S8ecaSoic aci8 Lj k9 SAN рD 1dC 1 j erFn oro8o8ecaSoic aci8 Lj kDoAN рD 1ďC 0dP2 Suy 03y21y1B10:2B 03y24y1B04:41 1 j erFn orotri8ecaSoic Aci8 Lj kTriAN 1ďC 0d4) Suy(03y21y1B10:2B 03y24y1B04:41 рD 1 03y21y1B10:2B 03y24y1B04:41 PeViludViltetVil6e/ andi/ a/ i6 0.38 NB 1dC OdIC Suv 1 (PFJeA) рD Cd) 0d11 Suy(03y21y1B10:2B 03y24y1B04:41 j erFn oro-S-&exa8ecaSoic aci8 1 Li k HxDAN 03y21y1B10:2B 03y24y1B04:41 j erFn oro-S-octaS8ecaSoic aci8 рD 1dC 0dB0 Suy(1 Li k6 DAN 1dCOdC1 Suy 03y21y1B10:2B 03y24y1B04:41 PeWiludWilbutane Sulfdnate (PFBS) 2.4 1 1dC 03y21y1B10:2B 03y24y1B04:41 PeWiludWilheoane Sulfdnate 13 0077 Suy(1 (PFHoS) 1 j erFn oro-1-&eCtaSes. nFoSate рD 1 dC0dB3 Suy(03y21y1B10:2B 03y24y1B04:41 Lị kHChN jerFnoro8ecaSes.nFoSateLjkDhN рD 1dC 1dl Suv(03y21y1B10:2B 03y24y1B04:41 1 PeViludVild/ tane Sulfdnate (PFOS) 3r 1dC 1ď Suy(03y21y1B10:2B 03y24y1B04:41 1 jerFnorooctaSeh.nFoSami8eLk6hAN рD 1dC 0dP7 Suy 03y21y1B10:2B 03y24y1B04:41 1 Isotope Dilution %Recovery Qualifier Limits Prepared Analyzed Dil Fac 13C8 FOSA 2 25 - 150 03/21/16 10:26 03/24/16 04:41 1 13C4 PFBA 49 25 - 150 03/21/16 10:26 03/24/16 04:41 1

TestAmerica hacrameSto

xatWo:cateW

I nieSt: h & aSSoS WG insoS j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSu Area TestAmerica Job ID: 320-1774C-1 hD5:31-1-1173P-004

Client Sample ID: 871T0 Date Cdlle/ te6: 03v14v1M18:28 Date Re/ ei5e6: 03v1MMM10:00

Lab Sample ID: 320-17748-12 x atMo: c ateW

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared Analyzed	Dil I
13C2 PFHxA	80		25 - 150	03/21/16 10:26 03/24/16 04:41	
13C4 PFOA	87		25 - 150	03/21/16 10:26 03/24/16 04:41	
13C5 PFNA	85		25 - 150	03/21/16 10:26 03/24/16 04:41	
13C2 PFDA	70		25 - 150	03/21/16 10:26 03/24/16 04:41	
13C2 PFUnA	87		25 - 150	03/21/16 10:26 03/24/16 04:41	
13C2 PFDoA	75		25 - 150	03/21/16 10:26 03/24/16 04:41	
18O2 PFHxS	110		25 - 150	03/21/16 10:26 03/24/16 04:41	
13C4 PFOS	105		25 - 150	03/21/16 10:26 03/24/16 04:41	
13C4-PFHpA	87		25 - 150	03/21/16 10:26 03/24/16 04:41	
13C5 PFPeA	79		25 - 150	03/21/16 10:26 03/24/16 04:41	

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Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17748-1 SDG: 31-1-11735-004

Prep Type: Total/NA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water

ient Sample ID 2286 28039 157 9077 351	3C8 FOS/ (25-150) 8 * 2 * 5 * 13 *	3C4 PFB/ (25-150) 56 43 46	3C2 PFHx. (25-150) 83	3C4 PFO/ (25-150) 88	3C5 PFN/ (25-150)	3C2 PFD/ (25-150)	3C2 PFUn (25-150)	3C2 PFD (25-150)
2286 28039 157 9077 351	8* 2* 5*	56 43	. ,		(25-150)	(25-150)	(25 - 150)	(25-150)
28039 157 9077 351	2 * 5 *	43	83	88			(100)	(20100
157 9077 351	5 *			00	80	88	98	77
9077 351		16	79	87	72	56	70	62
351	13 *	40	74	80	66	62	59	51
		60	86	90	86	80	99	74
	3 *	55	85	85	69	63	75	56
2384	3 *	39	80	98	70	71	74	68
2484	8 *	42	75	81	62	56	63	63
386	1 *	46	84	88	84	56	75	57
165	5 *	46	85	85	48	41	42	47
924	4 *	47	75	97	62	45	57	56
360	3 *	64	87	85	83	73	88	86
190	2 *	49	80	87	85	70	87	75
b Control Sample	42	87	89	94	89	89	87	80
b Control Sample Dup	38	92	81	82	83	75	95	77
ethod Blank	32	89	88	97	93	105	107	87
		Perce	ent Isotope	Dilution Re	coverv (Ac	ceptance Li	mits)	
	BO2 PFHx		•				,	
ient Sample ID	(25-150)	(25-150)	(25-150)					
2286	109	108	94					
28039	122	112	87	75				
157	105	103	94	74				
9077	117	109	98	79				
351	110	111	84	85				
2384	115	97	96	70				
2484	112	89	88	69				
386	120		86	71				
165	112	102	94	72				
924	112	111	86	82				
360	112	111	85	82				
190	110	105	87	79				
b Control Sample			98					
b Control Sample Dup	91	97	91	94				
ethod Blank	101	108	93	97				
	2484 386 165 924 360 190 5 Control Sample 5 Control Sample Dup thod Blank ent Sample ID 2286 28039 157 9077 351 2384 2484 386 165 924 360 190 5 Control Sample 5 Control Sample Dup	2484 8* 386 1* 165 5* 924 4* 360 3* 190 2* o Control Sample 42 o Control Sample Dup 38 thod Blank 32 BO2 PFHx (25-150) 2286 109 2286 109 2286 109 2384 115 2484 112 386 120 165 112 924 112 360 112 190 110 o Control Sample Dup 99 o Control Sample Dup 91	2484 8 * 42 386 1 * 46 165 5 * 46 924 4 * 47 360 3 * 64 190 2 * 49 5 Control Sample 42 87 5 Control Sample Dup 38 92 6 Control Sample Dup 38 92 286 109 108 28039 122 112 157 105 103 9077 117 109 351 110 111 2384 115 97 2484 112 89 386 120 104 165 112 102 924 112 111 190 110 105 190 110 105 190 110 105 190 110	2484 8* 42 75 386 1* 46 84 165 5* 46 85 924 4* 47 75 360 3* 64 87 190 2* 49 80 5 control Sample 42 87 89 5 control Sample Dup 38 92 81 5 802 87 89 88 Percent Isotope 802 75 364 94 28039 122 112 87 28039 122 112 87 157 105 103 94 28039 122 112 87 351 105 103 94 284 115 97 96 2484 112 89 88 366 120 104 86 165 112 102 94 924 112 111 86 360	2484 8* 42 75 81 386 1* 46 84 88 165 5* 46 85 85 924 4* 47 75 97 360 3* 64 87 85 924 4* 47 75 97 360 3* 64 87 85 190 2* 49 80 87 5 5 89 94 87 5 6 87 89 94 5 6 87 89 94 5 6 64 87 85 6 7 89 94 82 6 6 82 89 88 97 6 7 89 88 97 5 62 109 108 94 85 28039 122 112 87 75 85 2384 115 97 96 70	2484 8* 42 75 81 62 386 1* 46 84 88 84 165 5* 46 85 85 48 924 4* 47 75 97 62 360 3* 64 87 85 83 190 2* 49 80 87 85 5 64 87 89 94 89 5 6 64 87 89 94 89 5 6 64 87 89 94 89 5 6 60 87 85 83 97 93 5 6 60 162 84 97 93 94 89 94 85 93 94 94 95 93 94 93 94 94 95 93 93 94 94 95 95 94 93 94 93 94 93 94 94 95 95 95	24848 *42758162563861 *46848884561655 *46858548419244 *47759762453603 *64878583731902 *49808785705 control Sample4287899489895 control Sample Dup3892818283756 control Sample Dup3892818283756 control Sample Dup3892818283756 control Sample Dup389281828375228610910894859696228610910894759796228610910394749696228610910394749696228610911184859796238411597967096702484112898869989836612010486719636612010486719636611211186829836011211185829636011211185<	2484 8* 42 75 81 62 56 63 386 1* 46 84 88 84 56 75 165 5* 46 85 85 48 41 42 924 4* 47 75 97 62 45 57 360 3* 64 87 85 83 73 88 190 2* 49 80 87 85 70 87 o control Sample Dup 38 92 81 82 83 75 95 oc control Sample Dup 38 92 81 82 83 75 95 ethod Blank 32 64 94 89 89 80 107 2286 109 108 94 85 95 107 107 157 105 103 94 74 111 111 85 111 111 111 111 111 111 111 111 111 111 </td

13C2 PFHxA = 13C2 PFHxA 13C4 PFOA = 13C4 PFOA 13C5 PFNA = 13C5 PFNA 13C2 PFDA = 13C2 PFDA 13C2 PFUnA = 13C2 PFUnA 13C2 PFDoA = 13C2 PFUnA 13C2 PFDoA = 13C2 PFHxS 13C4 PFOS = 13C4 PFOS 13C4-PFHpA = 13C4-PFHpA 13C5 PFPeA = 13C5 PFPeA

Client Sample ID: Method Blank

Prep Type: Total/NA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-103929/1-A Matrix: Water

MB MB Analyte Result Qualifier RL MDL Unit D Prepared Analyzed DIFsc j erffitorobdtaSoic acit (B k) A. 8D 210 014N Sup 03g21yIN10:2N 03g23yIN20:P4 1 j erffitorobdtaSoic acit (B kK) A. 8D 210 0109 Sup 03g21yIN10:2N 03g23yIN20:P4 1 j erffitorobdextaSoic acit (B kK) A. 8D 210 0107 Sup 03g21yIN10:2N 03g23yIN20:P4 1 j erffitorobdextaSoic acit (B kK) A. 8D 210 010P Sup 03g21yIN10:2N 03g23yIN20:P4 1 j erffitorot(ecaSoic acit (B kDA. 0177 J 210 0144 Sup 03g21yIN10:2N 03g23yIN20:P4 1 j erffitorot(ecaSoic acit (B kDA. 0177 J 210 0147 Sup 03g21yIN10:2N 03g23yIN20:P4 1 j erffitorot(ecaSoic acit (B kDA. 0172 210 0147 Sup 03g21yIN10:2N 03g23yIN20:P4 1 j erffitorotocac	Analysis Batch: 104227								Prep Batch:	103929
j erfklorobdtaSoic aci (f) k) A. 8D 210 014N Sup 03/21/N10:2N 03/23/1N20:P4 1 j erfkloroxeStaSoic aci (f) k) eA. 8D 210 0129 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) eA. 8D 210 0120 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) eA. 8D 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) eA. 8D 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) eA. 8D 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) eA. 8D 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) eA. 8D 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) eA. 017N7 J 210 0144 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) EDA. 017N7 J 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxeStaSoic aci (f) k) EDA. 01270 J 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxetha(ecaSoic aci (f) k) EDA. 01270 J 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxetha(ecaSoic aci (f) k) EA. 12C J 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSoi eA (f) k) EA. 12C J 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSoi eA (f) k) EA. 12C J 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSoi eA (f) k) EA. 8D 210 012D Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) k) h. 8D 210 0127 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) k) h. 8D 210 0127 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) kDh. 8D 210 0127 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) kDh. 8D 210 0127 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) kDh. 8D 210 0127 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) kDh. 8D 210 0124 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) kDh. 8D 210 0124 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) kDh. 8D 210 0124 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaSe hdf6State f) kDh. 8D 210 0124 Sup 03/21/N10:2N 03/23/N120:P4 1 j erfkloroxStaS										
jerfitoroxeStaSoic aci(§ kjeA. 8 D 240 0199 Supp 03g2tyIN10:2N <			Qualifier				D			
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j erfitdorooctaSe h drfioSate B k Oh. 8 D 2LD 1L3 Suyp 03/21/1N 10:2N 03/23/1N 20:P4 1 j erfitdorooctaSe h drfioSami (e Bk Oh A. 8 D 2LD 0LN4 Suyp 03/21/1N 10:2N 03/23/1N 20:P4 1 MB MB Isotope Dilution %Recovery Qualifier Limits 03/21/16 10:26 03/23/16 20:54 1 13C4 PFBA 89 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFHxA 88 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOA 97 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFNA 93 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 105 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 105 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 105 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 105 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 105 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 107 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 107 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 107 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 107 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 107 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 107 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1	5	8 D		210	0L71	Suyp		03y21y1N10:2N	03y23y1N20:P4	1
j erfitdorooctaSe hdhfoSami(e Bk Oh A.8 D2 D0 UN4 Sup0 3/21/1N 10:2N0 3/23/1N 20:P41MBMBMBIsotope Dilution% RecoveryQualifierLimitsPreparedAnalyzedDil Fac13C8 FOSA3225.15003/21/16 10:2603/23/16 20:54113C4 PFBA8925.15003/21/16 10:2603/23/16 20:54113C2 PFHxA8825.15003/21/16 10:2603/23/16 20:54113C4 PFOA9725.15003/21/16 10:2603/23/16 20:54113C2 PFDA9325.15003/21/16 10:2603/23/16 20:54113C2 PFDA10525.15003/21/16 10:2603/23/16 20:54113C2 PFDA10525.15003/21/16 10:2603/23/16 20:54113C2 PFDA10725.15003/21/16 10:2603/23/16 20:54113C4 PFOS10825.15003/21/16 10:2603/23/16 20:54113C4 PFOS10825.15003/21/16 10:2603/23/16 20:54113C4 PFOS10825.15003/21/16 10:2603/23/16 20:54113C4 PFHpA9325.15003/21/16 10:2	jerFndoro(ecaSesdnFoSateBykDh.	8 D		210	112	Suyp		03y21y1N10:2N	03y23y1N20:P4	1
MB MB Isotope Dilution %Recovery Qualifier Limits Prepared Analyzed Dil Fac 13C8 FOSA 32 25-150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFBA 89 25-150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFHxA 88 25-150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOA 97 25-150 03/21/16 10:26 03/23/16 20:54 1 13C5 PFNA 93 25-150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 93 25-150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 105 25-150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 105 25-150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDA 107 25-150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDoA 87 25-150 03/21/16 10:26 03/23/16 20:54 1 1802 PFHxS	jerFndorooctaSehdnnōSateBjkOh.	8 D		210	1L3	Suyp		03y21y1N10:2N	03y23y1N20:P4	1
Isotope Dilution%RecoveryQualifierLimitsPreparedAnalyzedDil Fac13C8 FOSA3225.15003/21/16 10:2603/23/16 20:54113C4 PFBA8925.15003/21/16 10:2603/23/16 20:54113C2 PFHxA8825.15003/21/16 10:2603/23/16 20:54113C4 PFOA9725.15003/21/16 10:2603/23/16 20:54113C5 PFNA9325.15003/21/16 10:2603/23/16 20:54113C2 PFDA10525.15003/21/16 10:2603/23/16 20:54113C2 PFDA10525.15003/21/16 10:2603/23/16 20:54113C2 PFDA10725.15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725.15003/21/16 10:2603/23/16 20:54113C2 PFDA10125.15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725.15003/21/16 10:2603/23/16 20:54113C4 PFOS10125.15003/21/16 10:2603/23/16 20:54113C4 PFOS10825.15003/21/16 10:2603/23/16 20:54113C4 PFHpA93 <td< td=""><td>jerFndorooctaSehdnFoSami(eBkOhA.</td><td>8 D</td><td></td><td>210</td><td>0LN4</td><td>Suyp</td><td></td><td>03y21y1N10:2N</td><td>03y23y1N20:P4</td><td>1</td></td<>	jerFndorooctaSehdnFoSami(eBkOhA.	8 D		210	0LN4	Suyp		03y21y1N10:2N	03y23y1N20:P4	1
13C8 FOSA3225 - 15003/21/16 10:2603/23/16 20:54113C4 PFBA8925 - 15003/21/16 10:2603/23/16 20:54113C2 PFHxA8825 - 15003/21/16 10:2603/23/16 20:54113C4 PFOA9725 - 15003/21/16 10:2603/23/16 20:54113C5 PFNA9325 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10525 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10525 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10525 - 15003/21/16 10:2603/23/16 20:54113C2 PFUnA10725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA10725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725 - 15003/21/16 10:2603/23/16 20:54113C4 PFOS10125 - 15003/21/16 10:2603/23/16 20:54113C4 PFOS10825 - 15003/21/16 10:2603/23/16 20:54113C4 PFHpA9325 - 15003/21/16 10:2603/23/16 20:541		MB	MB							
13C4 PFBA8925 - 15003/21/16 10:2603/23/16 20:54113C2 PFHxA8825 - 15003/21/16 10:2603/23/16 20:54113C4 PFOA9725 - 15003/21/16 10:2603/23/16 20:54113C5 PFNA9325 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10525 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725 - 15003/21/16 10:2603/23/16 20:54113C2 PFHxS10125 - 15003/21/16 10:2603/23/16 20:54113C4 PFOS10825 - 15003/21/16 10:2603/23/16 20:54113C4 PFHpA9325 - 15003/21/16 10:2603/23/16 20:541	Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA8825 - 15003/21/16 10:2603/23/16 20:54113C4 PFOA9725 - 15003/21/16 10:2603/23/16 20:54113C5 PFNA9325 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10525 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10525 - 15003/21/16 10:2603/23/16 20:54113C2 PFUnA10725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725 - 15003/21/16 10:2603/23/16 20:54118O2 PFHxS10125 - 15003/21/16 10:2603/23/16 20:54113C4 PFOS10825 - 15003/21/16 10:2603/23/16 20:54113C4 PFHpA9325 - 15003/21/16 10:2603/23/16 20:541	13C8 FOSA	32		25 - 150				03/21/16 10:26	03/23/16 20:54	1
13C4 PFOA9725 - 15003/21/16 10:2603/23/16 20:54113C5 PFNA9325 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10525 - 15003/21/16 10:2603/23/16 20:54113C2 PFUnA10725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725 - 15003/21/16 10:2603/23/16 20:54118O2 PFHxS10125 - 15003/21/16 10:2603/23/16 20:54113C4 PFOS10825 - 15003/21/16 10:2603/23/16 20:54113C4 PFHpA9325 - 15003/21/16 10:2603/23/16 20:541	13C4 PFBA	89		25 - 150				03/21/16 10:26	03/23/16 20:54	1
13C5 PFNA9325 - 15003/21/16 10:2603/23/16 20:54113C2 PFDA10525 - 15003/21/16 10:2603/23/16 20:54113C2 PFUnA10725 - 15003/21/16 10:2603/23/16 20:54113C2 PFDoA8725 - 15003/21/16 10:2603/23/16 20:54118O2 PFHxS10125 - 15003/21/16 10:2603/23/16 20:54113C4 PFOS10825 - 15003/21/16 10:2603/23/16 20:54113C4 PFHpA9325 - 15003/21/16 10:2603/23/16 20:541	13C2 PFHxA	88		25 - 150				03/21/16 10:26	03/23/16 20:54	1
13C2 PFDA 105 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFUnA 107 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDoA 87 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDoA 87 25 - 150 03/21/16 10:26 03/23/16 20:54 1 18O2 PFHxS 101 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4-PFHpA 93 25 - 150 03/21/16 10:26 03/23/16 20:54 1	13C4 PFOA	97		25 - 150				03/21/16 10:26	03/23/16 20:54	1
13C2 PFUnA 107 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C2 PFDoA 87 25 - 150 03/21/16 10:26 03/23/16 20:54 1 18O2 PFHxS 101 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4-PFHpA 93 25 - 150 03/21/16 10:26 03/23/16 20:54 1	13C5 PFNA	93		25 - 150				03/21/16 10:26	03/23/16 20:54	1
13C2 PFDoA 87 25 - 150 03/21/16 10:26 03/23/16 20:54 1 18O2 PFHxS 101 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4-PFHpA 93 25 - 150 03/21/16 10:26 03/23/16 20:54 1	13C2 PFDA	105		25 - 150				03/21/16 10:26	03/23/16 20:54	1
1802 PFHxS 101 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4-PFHpA 93 25 - 150 03/21/16 10:26 03/23/16 20:54 1	13C2 PFUnA	107		25 - 150				03/21/16 10:26	03/23/16 20:54	1
13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4-PFHpA 93 25 - 150 03/21/16 10:26 03/23/16 20:54 1	13C2 PFDoA	87		25 - 150				03/21/16 10:26	03/23/16 20:54	1
13C4 PFOS 108 25 - 150 03/21/16 10:26 03/23/16 20:54 1 13C4-PFHpA 93 25 - 150 03/21/16 10:26 03/23/16 20:54 1	1802 PFHxS	101		25 - 150				03/21/16 10:26	03/23/16 20:54	1
13C4-PFHpA 93 25-150 03/21/16 10:26 03/23/16 20:54 1										1
	,									

Lab Sample ID: LCS 320-103929/2-A Matrix: Water Analysis Batch: 104227

Analysis Batch: 104227	Spike	201	LCS				Prep Batch: 103929 %Rec.
Analyte	Added		Qualifier	Unit	D %	Rec	Limits
jerFrodorobdtaSoic aci(Bjk)A.	4010	4117		Suyp		104	N0 - 140
jerFndoroxeStaSoicaci(BjkjeA.	4010	4310		Suyp		107	N0 - 140
jerFndoro&eHaSoicaci(Bjk6HA.	4010	3CL0		Suyp		9P	N0 - 140
jerFndoro&extaSoicaci(B)k6xA.	4010	3NL9		Suyp		92	N0 - 140
jerFndorooctaSoicaci(BjkOA.	4010	3712		Suyp		93	N0 - 140
jerFndoroSoSaSoicaci(Bjk8А.	4010	37L1		Suyp		93	N0 - 140
jerFrodoro(ecaSoicaci(BjkDA.	4010	34LC		Suyp		C7	N0 - 140

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Prep Type: Total/NA

Client Sample ID: Lab Control Sample

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Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-103929/2-A Matrix: Water			Clie	ent Sample ID	: Lab Control Sample Prep Type: Total/NA
Analysis Batch: 104227					Prep Batch: 103929
•	Spike	LCS LCS			%Rec.
Analyte	Added	Result Qualifier	Unit	D %Rec	Limits
j erfindorodS(ecaSoic aci(4010	3917	Suyp	99	N0 - 140
Bj kUSA.					
j erFrodoro(o(ecaSoicaci(4010	40LC	Suyp	102	N0 - 140
Bj k DoA.					
j erFredorotri(ecaSoic Aci(4010	37I₽	Suyp	94	P0 - 1P0
Bj k TriA.					
jerFrodorotetra(ecaSoicaci(4010	3313	Suyp	C3	P0 - 1P0
Bj kTeA.	1010				
jerFrodoro-S-&eHa(ecaSoicaci(4010	3213	Suyp	C1	P0 - 1P0
Bj k6HDA.	4010	4014	0	400	D0 4D0
j erFridoro-S-octaS(ecaSoic aci(4010	4211	Suyp	10P	P0 - 1P0
B kODA.	3Pl4	2PL9	Suyp	73	P0 - 1P0
jerFndorobdtaSehdnFoSate Bjk)h.	JE	2619	Suyp	75	FU- IFU
jerFrodoro&eHaSehdnFoSate	37LC	3PL7	Suyp	94	N0 - 140
Bik6Hh.	0112	0.1	cujp	01	
jerFrodoro-1-&extaSesdnioSate	3Q1	3212	Suyp	C4	P0 - 1P0
B k6xh.			7-		
j erfindoro(ecaSe sdnioSate	3CIN	4110	Suyp	10N	P0 - 1P0
B kDh.			21		
jerFrodorooctaSehdnīoSate	302	3214	Suyp	CP	N0 - 140
Ĵ BjkOh.					
jerFrodorooctaSehdnFoSami(e	4010	4412	Suyp	110	N0 - 140
BkOhA.					

	LCS	LCS	
Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	42		25 - 150
13C4 PFBA	87		25 - 150
13C2 PFHxA	89		25 - 150
13C4 PFOA	94		25 - 150
13C5 PFNA	89		25 - 150
13C2 PFDA	89		25 - 150
13C2 PFUnA	87		25 - 150
13C2 PFDoA	80		25 - 150
1802 PFHxS	99		25 - 150
13C4 PFOS	102		25 - 150
13C4-PFHpA	98		25 - 150
13C5 PFPeA	85		25 - 150

Lab Sample ID: LCSD 320-103929/3-A Matrix: Water Analysis Batch: 104227

Analysis Batch: 104227							Prep Ba	atch: 10)3929
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
jerFrodorobdtaSoic aci(Bjk)A.	4010	3NL3		Suyp		91	N0 - 140	14	30
jerFndoroxeStaSoicaci(BjkjeA.	4010	3714		Suyp		93	N0 - 140	14	30
jerFndoro&eHaSoicaci(Bjk6HA.	4010	37LC		Suyp		9P	N0 - 140	1	30
jerFndoro&extaSoicaci(Bjk6xA.	4010	3910		Suyp		97	N0 - 140	Р	30
jerFndorooctaSoicaci(BjkOA.	4010	42IP		Suyp		10N	N0 - 140	13	30
jerFndoroSoSaSoicaci(Bjk8A.	4010	3CL1		Suyp		9P	N0 - 140	3	30
jerFrodoro(ecaSoicaci(BjkDA.	4010	44IN		Suyp		112	N0 - 140	2P	30

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Prep Type: Total/NA

Client Sample ID: Lab Control Sample Dup

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-103929/3-A Matrix: Water			(Client Sa	ample ID: La	b Control Prep Ty			4
Analysis Batch: 104227	Spike	LCSD	LCSD			Prep Ba %Rec.	atch: 10	03929 RPD	
Analyte	Added	Result	Qualifier	Unit	D %Rec	Limits	RPD	Limit	
jerFridorodS(ecaSoic aci(4010	34LC		Suyp	C7	N0 - 140	13	30	6
Bj kUSA.									-
jerFredoro(o(ecaSoicaci	4010	39LC		Suyp	99	N0 - 140	2	30	
β kDoA.									
jerFrodorotri(ecaSoicAci(4010	4314		Suyp	109	P0 - 1P0	1P	30	6
Bj k TriA.									8
jerFrodorotetra(ecaSoicaci(4010	3QP		Suyp	9N	P0 _ 1P0	14	30	
BjkTeA.									9
jerFrdoro-S-&eHa(ecaSoicaci(4010	39IN		Suyp	99	P0 _ 1P0	20	30	
Bjk6HDA.									
jerFndoro-S-octaS(ecaSoicaci(4010	4PL3		Suyp	113	P0 - 1P0	7	30	
₿ kODA.				-					
jerFndorobdtaSehdnFoSate	3PL4	32IP		Suyp	92	P0 - 1P0	23	30	
Bjk)h.	0710	0.415		0					
jerFndoro&eHaSehdnfoSate	37LC	34IP		Suyp	91	N0 - 140	3	30	
Bjk6Hh.	2014			0	00	D0 4 D0	4.1	20	
jerFindoro-1-&extaSesdnToSate	301	3717		Suyp	99	P0 - 1P0	1N	30	1
Bjk6xh.	3CIN	34LC		Sup	90	P0 - 1P0	1N	30	
jerFroloro(ecaSesdnFoSate	3011	34L		Suyp	90	FU - IFU		30	
BjkDh.	302	3712		Suyp	97	N0 - 140	14	30	
jerFndorooctaSehdnfoSate BrkOh.	502	5112		Suyp	57	140 - 140	14	50	
jerFrodorooctaSehdnFoSami(e	4010	47LP		Suyp	119	N0 - 140	7	30	
BKOhA.	-010			აიუ	115	140 - 140	'	00	

	LCSD	LCSD	
Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	38		25 - 150
13C4 PFBA	92		25 - 150
13C2 PFHxA	81		25 - 150
13C4 PFOA	82		25 - 150
13C5 PFNA	83		25 - 150
13C2 PFDA	75		25 - 150
13C2 PFUnA	95		25 - 150
13C2 PFDoA	77		25 - 150
18O2 PFHxS	91		25 - 150
13C4 PFOS	97		25 - 150
13C4-PFHpA	91		25 - 150
13C5 PFPeA	94		25 - 150

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QC Association Summary

I nieSt: h & aSSoS WG insoS

j ro/ectyhite: I itf oFkairbaSgs kire TraiSiS8 Area

TestAmerica Job ID: 320-1774C-1 hD5:31-1-1173P-004

LCMS

Prep Batch: 103929

Prep Batch: 103929					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-1774C-1	NP22ON	Totany9 A	Gater	3P3P	5
320-1774C-2	3220036	Totany9 A	Gater	3P3P	C
320-1774C-3	C71P7	Totany9 A	Gater	3P3P	6
320-1774C-4	NN6077	Totany9 A	Gater	3P3P	0
320-1774C-P	C73P1	Totany9 A	Gater	3P3P	
320-1774C-N	P223C4	Totany9 A	Gater	3P3P	
320-1774C-7	P224C4	Totany9 A	Gater	3P3P	
320-1774C-C	C73ON	Totany9 A	Gater	3P3P	ŏ
320-1774C-6	C71NP	Totany9 A	Gater	3P3P	
320-1774C-10	62624	Totany9 A	Gater	3P3P	9
320-1774C-11	C73N0	Totany9 A	Gater	3P3P	
320-1774C-12	C7160	Totany9 A	Gater	3P3P	
LI h 320-103626y2-A	Lab I oStronhampne	Totany9 A	Gater	3P3P	
LI hD 320-103626y8-A	Lab I oStronhampne Dup	Totany9 A	Gater	3P3P	
MB 320-103626y1-A	Met&od BnaSg	Totany9 A	Gater	3P3P	
Analysis Batch: 1042	27				
Lab Sample ID	Client Sample ID	Pren Tyne	Matrix	Method	Pren Batch

320-17740-12	C/160	I otanje A	Gater	3P3P		
LI h 320-103626y2-A	Lab I oStronh ampre	Totany9 A	Gater	3P3P		
LI hD 320-103626y8-A	Lab I oStronh ampre Dup	Totany9 A	Gater	3P3P		
MB 320-103626y1-A	Met&od BnaSg	Totan9 A	Gater	3P3P		
Analysis Batch: 1042	27					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch	13
320-1774C-1	NP22CN	Totany A	Gater	Gh-Ll-002P	103626	
320-1774C-2	3220036	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-3	C71P7	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-4	NN6077	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-P	C73P1	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-N	P223C4	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-7	P224C4	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-C	C730N	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-6	C71NP	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-10	62624	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-11	C73N0	Totany9 A	Gater	Gh-Ll -002P	103626	
320-1774C-12	C7160	Totany9 A	Gater	Gh-Ll -002P	103626	
LI h 320-103626y2-A	Lab I oStronhampre	Totany9 A	Gater	Gh-Ll -002P	103626	
LI hD 320-103626y8-A	Lab I oStronhampre Dup	Totany9 A	Gater	Gh-Ll -002P	103626	
MB 320-103626y1-A	Met&od BnaSg	Totany9 A	Gater	Gh-LI -002P	103626	
L						

Lab Chronicle

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17748-1 SDG: 31-1-11735-004

Lab Sample ID: 210-4Mk3-1

Lab Sample ID: 210-4Mk3-2

Lab Sample ID: 210-4Mk3-x

Lab Sample ID: 210-4Mk3-7

Lab Sample ID: 210-4Mk3-8

Client Sample ID: 871138 Date Collecte6: 02RxR8 44:1M Date v ecei5e6: 02R8R8 40:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535			557.7 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	557.7 mL	1.00 mL	104227	03/24/16 00:26	JRB	TAL SAC

Client Sample ID: 2113029 Date Collecte6: 02RxR8 41:4x Date v ecei5e6: 02R8R8 40:00

Ргер Туре	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			562.4 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	562.4 mL	1.00 mL	104227	03/24/16 00:47	JRB	TAL SAC

Client Sample ID: 3M47M Date Collecte6: 02RxR8 42:00 Date v ecei5e6: 02R8R8 40:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535			566.8 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	566.8 mL	1.00 mL	104227	03/24/16 01:30	JRB	TAL SAC

Client Sample ID: 8890MM Date Collecte6: 02RxR8 4x:4x Date v ecei5e6: 02R8R8 40:00

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			569.6 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	569.6 mL	1.00 mL	104227	03/24/16 01:51	JRB	TAL SAC

Client Sample ID: 3M274 Date Collecte6: 02R4xR48 09:20 Date v ecei5e6: 02R8R8 40:00

Prep Type	Batch Type	Batch Wetho6	v un	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepare6 or Analyze6	Analyst	Lab
Total/NA	Prep	3535			555.6 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAG
Total/NA	Analysis	WS-LC-0025		1	555.6 mL	1.00 mL	104227	03/24/16 02:12	JRB	TAL SA

Client Sample ID: 71123x Date Collecte6: 02R4xR48 40:20 Date v ecei5e6: 02R8R8 40:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535			541.2 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	541.2 mL	1.00 mL	104227	03/24/16 02:34	JRB	TAL SAC

TestAmerica Sacramento

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Lab Chronicle

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17748-1 SDG: 31-1-11735-004

Lab Sample ID: 210-4Mk3-M

Lab Sample ID: 210-4Mk3-3

Lab Sample ID: 210-4Mk3-9

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Watrid: / ater

Watrid: / ater

Client Sample ID: 711x3x Date Collecte6: 02RxR8 40:10 Date vecei5e6: 02848848 40:00

Date Vecciber	0. 02140140 -									
	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535			544.6 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	544.6 mL	1.00 mL	104227	03/24/16 02:55	JRB	TAL SAC

Client Sample ID: 3M238 Date Collecte6: 02RxR8 44:40 Date v ecei5e6: 02R48R48 40:00

-	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535			553.7 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553.7 mL	1.00 mL	104227	03/24/16 03:16	JRB	TAL SAC

Client Sample ID: 3M487 Date Collecte6: 02RxR8 42:08 Date v ecei5e6: 02F48F48 40:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535		-	548.6 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	548.6 mL	1.00 mL	104227	03/24/16 03:37	JRB	TAL SAC

Client Sample ID: 9191x Date Collecte6: 02R4xR48 4x:07 Date v ecei5e6: 02R48R48 40:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535			544 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	544 mL	1.00 mL	104227	03/24/16 03:59	JRB	TAL SAC

Client Sample ID: 3M280 Date Collecte6: 02RxR8 4Mx3 Date v ecei5e6: 02R8R8 40:00

-										
	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535			565.5 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	565.5 mL	1.00 mL	104227	03/24/16 04:20	JRB	TAL SAC

Client Sample ID: 3M490 Date Collecte6: 02RxR8 43:13 Date v ecei5e6: 02R48R48 40:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepare6		
Prep Type	Туре	Wetho6	v un	Factor	Amount	Amount	Number	or Analyze6	Analyst	Lab
Total/NA	Prep	3535			564.1 mL	1.00 mL	103929	03/21/16 10:26	HJA	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	564.1 mL	1.00 mL	104227	03/24/16 04:41	JRB	TAL SAC

TestAmerica Sacramento

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Lab Sample ID: 210-4Mk3-40

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Lab Sample ID: 210-4Mk3-44 Watrid: / ater

Lab Sample ID: 210-4Mk3-41

Watrid: / ater

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17748-1 SDG: 31-1-11735-004

Laboratory v eferences:

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

TestAmerica Sacramento

Certification Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-17748-1 SDG: 31-1-11735-004

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date	
A2LA	DoD ELAP		2928-01	01-31-17	/
Alaska (UST)	State Program	10	UST-055	12-18-16	
Arizona	State Program	9	AZ0708	08-11-16	
Arkansas DEQ	State Program	6	88-0691	06-17-16	
California	State Program	9	2897	01-31-17	
Colorado	State Program	8	N/A	08-31-16	
Connecticut	State Program	1	PH-0691	06-30-17	
Florida	NELAP	4	E87570	06-30-16	
Hawaii	State Program	9	N/A	01-31-17	
Illinois	NELAP	5	200060	03-17-17	
Kansas	NELAP	7	E-10375	05-31-16	
Louisiana	NELAP	6	30612	06-30-16	
Michigan	State Program	5	9947	01-31-18	
Nevada	State Program	9	CA44	07-31-16	
New Jersey	NELAP	2	CA005	06-30-16	
New York	NELAP	2	11666	04-01-16	
Oregon	NELAP	10	CA200005	01-29-17	
Pennsylvania	NELAP	3	9947	03-31-16	
Texas	NELAP	6	T104704399-15-9	05-31-16	
US Fish & Wildlife	Federal		LE148388-0	10-31-16	
USDA	Federal		P330-11-00436	12-30-17	
USEPA UCMR	Federal	1	CA00044	11-06-16	
Utah	NELAP	8	QUAN1	02-28-17	
Virginia	NELAP Secondary AB	3	460278	03-14-17	
Washington	State Program	10	C581	05-04-16	
West Virginia (DW)	State Program	3	9930C	12-31-16	
Wyoming	State Program	8	8TMS-Q	01-29-17	

Method Summary

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j ro/ectyhite: I itf oFkairbaSgs kire TraiSiSL Area

TestAmerica Job ID: 320-1774C-1 hD5: 31-1-1173P-004 1

thod	Method Description	Protocol	Laboratory
n-a -002P	jerFredoriSateH=fHrocarboSs	TAOhuj	TAOhAl
Protocol Re	erences:		
TAOhuj	, TestAmerica QaboratoriesphtaSHarHu 8eratiSL j roceHdre		
Laboratory	References:		
TAOhAl	, TestAmerica hacrameStopCC0 RiversiHe j argwaf pG est hacrameStopI A 9P60PpTEO(916)373	-P600	

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Sample Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17748-1 SDG: 31-1-11735-004

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-17748-1	652286	Water	03/14/16 11:27	03/16/16 10:00
320-17748-2	3228039	Water	03/14/16 12:14	03/16/16 10:00
320-17748-3	87157	Water	03/14/16 13:00	03/16/16 10:00
320-17748-4	669077	Water	03/14/16 14:14	03/16/16 10:00
320-17748-5	87351	Water	03/14/16 09:30	03/16/16 10:00
320-17748-6	522384	Water	03/14/16 10:30	03/16/16 10:00
320-17748-7	522484	Water	03/14/16 10:20	03/16/16 10:00
320-17748-8	87386	Water	03/14/16 11:10	03/16/16 10:00
320-17748-9	87165	Water	03/14/16 13:06	03/16/16 10:00
320-17748-10	92924	Water	03/14/16 14:05	03/16/16 10:00
320-17748-11	87360	Water	03/14/16 17:48	03/16/16 10:00
320-17748-12	87190	Water	03/14/16 18:28	03/16/16 10:00

TestAmerica Sacramento

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	SON. INC. tal Consultants	HAIN	-OF-Cl		20-17748 Ch	ain of Custody	Labo	ratory Te	Page 1 St Americ Altreks	of 2
400 N. 34th Street, Suite 100 2043 Westpo Seattle, WA 98103 St. Louis, MC (206), 632, 6020 (314) 699-960 2355 Hill Road 5430 Fairban	0 63146-3564 Pasco, WA	Andrews Loo 99301-3378 309	pp, Suite A	_		 (include) 	s/Sample Container preservative if used)			
Fairbanks, AK 99709 Anchorage, A (907) 479-9600 (907) 561-212	K 99518			//	5		/ /	/ /		
2255 S W Canyon Road 1321 Bannoc Portland, OR 97201-2498 Denver, CO 8 (503) 223-6147 (303) 825-380	00	Date	100 100	200	AL DOU	/ /		1.00 CONDIC	\$	
Sample Identity	Lab No Time	Sampleo		_	7 - 1		(Remarks/Matrix	(
652286	1127	3/14/1		X					ater	
- 322 8039	1214		X	×				2		
- 87157	1300			×				2-	_	
669077	1414		×	x				2	1 do	
- 87351	0930		X	X				2		
572384	1030		X	X				2		
533484	1020		X	X				2		
87386	1110		X	X				2		
87105	1300		A	X				2		
40904	1405	4	X	à				2	+	
Project Information	Sample Receip	et	Relinq				lished By: 2.	Reli	nquished By:	3.
Project Number 31-1-11735-004			Signatural	0.0		Signature	Time	Signature.	Trme	
Project Name. Cof Fire Training			Printed Name	- I	Date 3/15/10	Printed Name.	Date	Printed Nari	ne Date	
Contact. MON/SAK CONK	Received Good Cond /Cold		Marcy	Na				-		
Sampler MDN/TXG	(attach shipping bill, if any)	`	Company	u the	Vilson	Company:		Company		
Instru			Receiv			Receive	ed By: 2.	Rece	eived By:	3.
Requested Turnaround TIME, Size Clavel		Signature				Timė	Signature	Time.		
Special Instructions Please notity upon reaser		Printed Name Date 3:16/16 Share Van Ommen		Printed Name:	Printed Name: Date		Printed Name Date			
	to Shannon & Wilson w/ labora		Company.	WS)	Company [,]		Company		
19-91/UR						3.7-6	/		No. 33	951

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3/25/2016

EUD SHANNON & WILSON, Geotechnical and Environmental Cons N. 34th Street, Surie 100 2043 Westport Center attle, WA 98103 St. Louis, MO 63146-3	sultants or Drive 2705 Saint Andrews Loo 3564 Pasco, WA 99301-3378		Labora Attn:	Page 2 of 3 atory Test America Devid Alltracker
107 302 8900 (314) 699-9660 56 Hill Road 5430 Fairbanks Street 17) 479 0800 5430 Fairbanks Street 17) 479 0800 1321 Bannock Street, 55 S W Canyon Road 1321 Bannock Street, 132 23-6147 0303 825-3800	s , Suite 200 Date	A Start Start	(include presentative if used)	A LUT COLOR
Sample Identity Lab N			-	7 Remarks/Matrix
87190	1748 3/14/10			2 1
Project Information	Sample Receipt	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
(hand)	Number of Containers	Signature Time 0235 S M. Uslel Printed Name Date 3/15/100		Signature Time
	ved Good Cond./Cold	Mary Nadel	Company	Company
ampler (attach	Stipping bill, if any)	Shannan & W. Kon Received By: 1.	Received By: 2.	Deschool Duy - 0
equested Turnarconcome		· · · · · · · · · · · · · · · · · · ·	Received By: 2. Signature Time	Received By: -3. Signature Time
pecial Instructions:			Printed Name Date	Printed Name Date:
stribution: White - w/shipment - returned to Shan	nnon & Wilson w/ laboratory report	Company TAWS	Company'	Company

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3/25/2016

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Client: Shannon & Wilson

Login Number: 17748 List Number: 1 Creator: Nelson, Kym D

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

Job Number: 320-17748-1 SDG Number: 31-1-11735-004

List Source: TestAmerica Sacramento

Laboratory Data Review Checklist

Completed by: Tiffany Green
Title:Environmental ScientistDate:March 25, 2016
CS Report Name: City of Fairbanks Fire Training Area Report Date: March 25, 2016
Consultant Firm: Shannon & Wilson, Inc.
Laboratory Name: TestAmerica, Inc. Laboratory Report Number: 320-17748
ADEC File Number: 102.38.182 ADEC RecKey Number:
1. Laboratory a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? □Yes □ No ⊠NA (Please explain.) Comments:
The ADEC has not approved any analytical laboratory for perfluorinated compound (PFC) analysis.
 b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved? ☐Yes ☐ No ☑NA (Please explain.) Comments:
Analyses were performed by TestAmerica, Inc. in Folsom, California.
 <u>Chain of Custody (COC)</u> a. COC information completed, signed, and dated (including released/received by)? ∑Yes □ No □NA (Please explain.) Comments:
b. Correct analyses requested? Xes No NA (Please explain.) Comments:
 3. <u>Laboratory Sample Receipt Documentation</u> a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)? ∑Yes □ No □NA (Please explain.) Comments:
The temperature blank or cooler was measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the laboratory, as specified in the EPA publication SW-846. This range has been approved by ADEC.

b.	Sample preservation acceptable – acidified waters, Metha Volatile Chlorinated Solvents, etc.)?	anol preserved VOC soil (GRO, BTEX,
		Comments:
	Analysis of PFCs does not require a preservative.	
c.	Sample condition documented – broken, leaking (Methar	
	$ Yes \square No \square NA (Please explain.) $	Comments:
,	The sample-receipt form notes that the samples were received	ved in good condition.
d.	If there were any discrepancies, were they documented? I containers/preservation, sample temperature outside of ac samples, etc.?	cceptable range, insufficient or missing
	$\Box Y es \Box No \Box NA (Please explain.) $	Comments:
, r	There were no discrepancies reported.	
e.	Data quality or usability affected? (Please explain.)	Comments:
1	No, the data quality and usability were unaffected.	
	Narrative Present and understandable? ∑Yes □ No □NA (Please explain.)	Comments:
L		
b.	Discrepancies, errors or QC failures identified by the lab Yes No NA (Please explain.)	? Comments:
, r	The case narrative identifies the following discrepancies:	
s c	The Isotope Dilution Analyte (IDA) recovery for method V amples is below the method-recommended limit of 25% to onsidered affected if the IDA signal-to-noise ratio is greate DA in the samples.	150%. Generally, data quality is not
	The reporting limit for PFHxDA was raised due to problem urve. Results below the revised PQL should be considered	
	Organic preparation method 3535: Insufficient sample volu pike/matrix spike duplicate (MS/MSD) associated with sar	1
c.		Comments:
	Yes: see above.	

Yes; see above.

4.

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

	connients.
	IDA recovery failures are considered to affect data quality, and are discussed in Section 6c. The method reporting limit and organic preparation batch comments are not considered to affect data quality or usability.
5.	Samples Results a. Correct analyses performed/reported as requested on COC? Yes No NA (Please explain.) Comments:
	 b. All applicable holding times met? ∑Yes □ No □NA (Please explain.) Comments:
	The hold time of seven days until extraction was met.
	c. All soils reported on a dry weight basis? ☐Yes ☐ No ⊠NA (Please explain.) Comments:
	N/A; no soil samples were submitted with this work order.
	 d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project? Yes No NA (Please explain.)
	The PQL, equivalent to the TestAmerica Reporting Limit (RL), is less than applicable EPA provisional drinking water health advisory levels and ADEC proposed groundwater-cleanup levels for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).
	e. Data quality or usability affected? Comments:
	The data quality and usability were unaffected.
6.	<u>QC Samples</u> a. Method Blank i. One method blank reported per matrix, analysis and 20 samples? ∑Yes ☐ No ☐NA (Please explain.) Comments:
	ii. All method blank results less than PQL? ∑Yes ∑ No □NA (Please explain.) Comments:
	Five PFC analytes were detected in the MB at estimated concentrations less than their PQLs (reporting limits, or RLs). These analytes are perfluorodecanoic acid (PFDA), perfluorododecanoic acid (PFDoA), perfluorotetradecanoic acid (PFTeA), perfluoroundecanoic acid (PFUnA), and perfluoron-noctandecanoic acid (PFODA).

iii. If above PQL, what samples are affected?

Comments:

Each of the twelve samples were associated with the MB containing detectable perfluorinated
compounds. The results for PFUnA are considered unaffected because PFUnA was not detected in
the project samples.

The results for PFDA, PFDoA, PFTeA, and PFODA are considered to affect at least one sample result because they were present in the MB at concentrations less than or equal to the LOQ, and the sample concentrations were within a factor of five of the MB concentrations.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined? Xes No NA (Please explain.) Comments:

Where not already qualified by the laboratory, these results are considered not detected and flagged 'B*' at either the reported sample result or the PQL, whichever is higher.

v. Data quality or usability affected? (Please explain.)

Comments:

Yes; see above.

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

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

 $Yes \square No \square NA (Please explain.)$ Comments:

LCS/LCSD sample results were reported.

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

Yes No NA (Please explain.) Comments:

Metals and inorganics were not analyzed as part of 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 □ No □NA (Please explain.) Comments:

Yes; percent recoveries were between 60% and 140% or 150% depending on the analytes, as required by the laboratory method.

 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)

 \bigvee Yes \square No \square NA (Please explain.)

Comments:

Yes; LCS/LCSD RPDs were within the laboratory limit of 30%.

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

N/A; percent recoveries and RPDs were within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined? Yes No No NA (Please explain.) Comments:

N/A; no data flags are required.

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

The data quality and usability were unaffected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples? [Yes] No [NA (Please explain.) Comments:

The analytical method WS-LC-0025 uses Isotope Dilution Analyte (IDA) recovery, which entails adding a 13C-isotope of each target analyte and assessing the recovery of each analyte. The isotopically labeled compounds are the surrogates for this method.

 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 X No □NA (Please explain.)

With the exception of 13C8 perfluorooctane sulfonamide (FOSA), the percent recoveries are within the method-recommended limit of 25% to 150%. The percent recovery for FOSA is below the method recommended limit for each of the 12 samples. However, according to the laboratory, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which was achieved for all IDAs in the samples.

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

Comments:

The data did not require flags.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

The data quality and usability were unaffected.

- d. Trip blank Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

PFCs are not volatile compounds, so a trip blank is not required.

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

No trip blank is required; see above.

iii. All results less than PQL?☐ Yes ☐ No ☐ NA (Please explain.)

Comments:

No trip blank is required; see above.

iv. If above PQL, what samples are affected?

Comments:

No trip blank is required; see above.

v. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples? Xes No NA (Please explain.) Comments:

ii. Submitted blind to lab?

 $\bigvee Yes \square No \square NA (Please explain.)$

Comments:

The field duplicate pair "522384" / "522484" was submitted for this work order.

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

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

 $R_2 = Field Duplicate Concentration$ $Ves \boxtimes No \square NA (Please explain.)$ Comments:

The following analytes did not meet recommended RPD criteria: PFDA RPD = 47%; PFTeA RPD = 89%; perfluoro-1-heptanesulfonate (PFHpS) RPD=43%. The RPD values for the other PFC analytes, where calculable for detected results, meet QC criteria.

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

Comments:

Data quality for PFDA, PFTeA, and PFHpS results in the field duplicate pair is considered affected. The results for "522384" and "522484" are considered estimated and flagged 'J*' where not already qualified.

f. Decontamination or Equipment Blank (If not used explain why).

Yes No NA (Please explain.)

Comments:

Reusable equipment was not used in sample collection for this work order, so an equipment blank is not required.

i. All results less than PQL?

 \Box Yes \Box No \bigotimes NA (Please explain.)

Comments:

N/A; an equipment blank was not required.

ii. If above PQL, what samples are affected?

Comments:

N/A; an equipment blank was not required.

iii. Data quality or usability affected? (Please explain.)

Comments:

	[The data quality and usability were not affected.					
7.	Othe	r Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific,	etc.)				
	a	. Defined and appropriate?					
		\Box Yes \Box No \bigotimes NA (Please explain.)	Comments:				

Version 2.7



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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

TestAmerica Job ID: 320-18463-1

TestAmerica Sample Delivery Group: 31-1-11735-004 Client Project/Site: City of Fairbanks Fire Training Area Revision: 1

For:

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

Attn: Julie Keener



Authorized for release by: 5/18/2016 12:21:41 PM

David Alltucker, Project Manager I (916)374-4383 david.alltucker@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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





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Definitions/Glossary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Qualifiers

LCMS

LOWIS	
Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
В	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	
CFL	Contains Free Liquid	
CNF	Contains no Free Liquid	
DER	Duplicate error ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample	
DLC	Decision level concentration	
MDA	Minimum detectable activity	
EDL	Estimated Detection Limit	
MDC	Minimum detectable concentration	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
QC	Quality Control	
RER	Relative error ratio	
RL	Reporting Limit or Requested Limit (Radiochemistry)	
RPD	Relative Percent Difference, a measure of the relative difference between two points	
TEF	Toxicity Equivalent Factor (Dioxin)	
TEQ	Toxicity Equivalent Quotient (Dioxin)	

TestAmerica Sacramento

Job ID: 320-17483-1

Laboratory: TestAmerica Sacramento

Narrative

Job Narrative 320-17483-1

Receipt

The samples were received on 4/22/2016 11:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.9° C.

LCMS

Method(s) WS-LC-0025: The continuing calibration verification (CCV) associated with batch 109605 recovered above the upper control limit for Perfluorooctane Sulfonamide (FOSA). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5) and 4527158 (320-18463-9).

Method(s) WS-LC-0025: The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 167754 (320-18463-1), 167854 (320-18463-2), 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5), 127311 (320-18463-6), 127230 (320-18463-7), 524565 (320-18463-8), 4527158 (320-18463-9), 526576 (320-18463-11), 526676 (320-18463-12) and 127523 (320-18463-13). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method(s) WS-LC-0025: Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following sample: (MB 320-107572/1-A). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

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

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-107572

Method(s) 3535: Samples were amber colored.167754 (320-18463-1), 167854 (320-18463-2), 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5), 127311 (320-18463-6), 127230 (320-18463-7), 524565 (320-18463-8), 4527158 (320-18463-9), 127124 (320-18463-10), 526576 (320-18463-11), 526676 (320-18463-12) and 127523 (320-18463-13) Samples 7 and 9 were clogged and took extra time to load into the columns.

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

I nieSt: h & aSSoS WG insoS

/ royectfhite: I itF okgairbaSus gire TraiSiSd Area

Client Sample ID: 65228L

ba3 Sample ID: 0-1764L5076

Analyte	Result Qualifier	Rb	MDb (Unit	Dil Fac	D Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	0.7	117	0140	SdfN	1	Gh-N -002j	Totaníp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	13	117	0L7P \$	SdfN	1	Gh- N -002j	Totanfip A
/ erkn(oro&exaSoic aciB)/ gHxA8	1P	117	01.06 \$	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(oro&e9taSoic aciB)/ gH9A8	4IP	117	01P1 \$	SdfN	1	Gh- N -002j	Totaníp A
/ erkn(orooctaSoic aciB)/ gOA8	713	117	0100 \$	SdfN	1	Gh-NI-002j	Totanfp A
/erkn(oroSoSaSoicaciB)/gpA8	016P J	1L7	0Lj7 \$	SdfN	1	Gh-NI-002j	Totaníp A
/ erkn(oro(SBecaSoic aciB)/gUSA8	OLPP J	1L7	0100 \$	SdfN	1	Gh-NI-002j	Totaníp A
/ erkn(oroBoBecaSoic aciB)/ gDoA8	1L1 J	117	0Lj1 \$	SdfN	1	Gh-NI-002j	Totaníp A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	0LC1 J	117	0比7 \$	SdfN	1	Gh- N -002j	Totaníp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L1 J.	117	0L11 \$	SdfN	1	Gh- N -002j	Totarlip A
/enkn(orob(taSeh(nkoSate)/g.h8	PL6	117	0171 \$	SdfN	1	Gh-NI-002j	Totanfp A
/enkn(oro&exaSeh(nkoSate)/gHxh8	37	117	0LPP S	SdfN	1	Gh-NI-002j	Totaníp A
/erkn(oro-1-&e9taSes(nkoSate)/gH9h8	116	117	01C3 \$	SdfN	1	Gh- N -002j	Totarlip A
/erkn(orooctaSeh(nkoSate)/gOh8	4P	117	111 \$	SdfN	1	Gh-NI-002j	Totarlip A
Client Sample ID: 65248L					ba3 S	ample ID: 0	- 1 7 64L507-
Analyte	Result Qualifier	Rb	MDb (Unit	Dil Fac	D Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	jų.	117	0142	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	13	117	0160	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(oro&exaSoic aciB)/ gHxA8	17	117	0LP2 \$	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(oro&e9taSoic aciB)/ gH9A8	4lj	117	0LP3 \$	SdfN	1	Gh-NI-002j	Totanfp A

Client Sample ID: 65248L

ba3 Sample ID: 0-1764L507-

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	j Ļi		117	0142	SdfN	1	_	Gh-N -002j	Totanfp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	13		117	0160	SdfN	1		Gh-NI-002j	Totanfip A
/ erkn(oro&exaSoic aciB)/ gHxA8	17		117	01P2	SdfN	1		Gh-NI-002j	Totanfip A
/ erkn(oro&e9taSoic aciB)/ gH9A8	4lj		117	01P3	SdfN	1		Gh-NI-002j	Totanfip A
/ erkn(orooctaSoic aciB)/ gOA8	716		117	0LC7	SdfN	1		Gh-NI-002j	Totanfp A
/ erkn(oroSoSaSoic aciB)/ gpA8	114	J	117	0100	SdfN	1		Gh-NI-002j	Totanfip A
/ erkn(oroBoBecaSoic aciB)/ gDoA8	110	J	117	0lj 3	SdfN	1		Gh-NI-002j	Totanfip A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	112	J	117	0L17	SdfN	1		Gh-NI-002j	Totanfip A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	1LP	J.	117	0L11	SdfN	1		Gh- N -002j	Totanfp A
/ erkt(oro-S-octaSBecaSoic aciB // gODA8	910P	J	117	0LC1	SdfN	1		Gh- N -002j	Totarlip A
/erkn(orob(taSeh(nkoSate)/g.h8	610		117	0174	SdfN	1		Gh-NI-002j	Totanfp A
/erkn(oro&exaSeh(nkoSate)/gHxh8	46		117	0170	SdfN	1		Gh-NI-002j	Totanfip A
/erkn(oro-1-&e9taSes(nkoSate)/gH9h8	213		117	0LCj	SdfN	1		Gh- N -002j	Totanfp A
/erkn(orooctaSeh(nkoSate)/gOh8	j 1		117	112	SdfN	1		Gh-NI-002j	Totanfp A
/erkn(orooctaSeh(nkoSamiBe)gOhA8	4L3		117	0lj 7	SdfN	1		Gh-NI-002j	Totanfp A

Client Sample ID: 98LL0

ba3 Sample ID: 0-1764L5070

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	314		116	0143	SdfN	1	-	Gh-N -002j	Totanfp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	j 14		116	0163	SdfN	1		Gh-NI-002j	Totanfip A
/ erkn(oro&exaSoic aciB)/ gHxA8	jЮ		116	0LP4	SdfN	1		Gh-NI-002j	Totanfp A
/ erkn(oro&e9taSoic aciB)/ gH9A8	2L1		116	0LPj	SdfN	1		Gh-NI-002j	Totanfp A
′erkn(orooctaSoic aciB)/ gOA8	312		116	0LP0	SdfN	1		Gh-NI-002j	Totanfip A
erkn(orotetraBecaSoic aciB)/gTeA8	0L4P	J	116	0Ľ16	SdfN	1		Gh-NI-002j	Totanfp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	112	J .	116	0L12	SdfN	1		Gh-NI-002j	Totanfp A
/enkn(orob(taSeh(nkoSate)/g.h8	210		116	0L7C	SdfN	1		Gh-NI-002j	Totanfp A
/enkn(oro&exaSeh(nkoSate)/gHxh8	j L4		116	0L71	SdfN	1		Gh-NI-002j	Totarlip A

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I nieSt: h & aSSoS WG insoS

/ royectfhite: I itF okgairbaSus gire TraiSiSd Area

Client Sample ID: 98LL0 (Continued)

Analyte	Result Qualifier	Rb	MDb Unit	Dil Fac D Method	Prep Type
/ erkn(orooctaSe h(nkoSate)/gOh8	j IP	116	112 SdfN	1 Gh-N -002j	Totarlip A

Client Sample ID: L66455

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac D	Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	317		117	0140	SdfN		Gh-N -002j	Totanfp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	2LC		117	0L7P	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(oro&exaSoic aciB)/ gHxA8	317		117	0106	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(oro&e9taSoic aciB)/ gH9A8	016C	J	117	0LP0	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(orooctaSoic aciB)/ gOA8	213		117	0100	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	114	J.	117	0L11	SdfN	1	Gh-N -002j	Totarlip A
/enkn(oro&exaSeh(nkoSate)/gHxh8	1Ц	J	117	0LPC	SdfN	1	Gh-NI-002j	Totanfp A

Client Sample ID: L8L92L

Analyte **Result Qualifier** Rb MDb Unit Dil Fac D Method Prep Type / erkn(orob(taSoic aciB)/g. A8 216 117 0L42 SdfN Gh-N -002j Totarfip A 1 / erkn oro9eStaSoic aciB)/ g/ eA8 j 14 117 0L61 SdfN 1 Gh-N -002j Totanfp A / erkn(oro&exaSoic aciB)/ gHxA8 CL1 Gh-N -002j Totanfp A 1L7 0LP2 SdfN 1 / erkn(oro&e9taSoic aciB)/ gH9A8 210 1L7 0LP4 SdfN Gh-N -002j Totanfp A 1 / erkn(orooctaSoic aciB)/ gOA8 2LP 117 0LC6 SdfN Gh-N -002j Totanfp A 1 / erkn(orotetraBecaSoic aciB)/ gTeA8 0L71 J 1L7 0L17 SdfN 1 Gh-N -002j Totanfp A 0LC2 J. 117 0L11 SdfN 1 Gh-N -002j Totanfp A / erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8 /erkn(orob(taSeh(nkoSate)/g.h8 1L3 J 117 0L7j SdfN 1 Gh-N -002j Totanfp A Gh-N -002j /enkn(oro&exaSeh(nkoSate)/gHxh8 412 117 0L70 SdfN Totanfp A 1 / erkn(orooctaSeh(nkoSate)/gOh8 QР 117 1L2 SdfN 1 Gh-N -002j Totanfp A

Client Sample ID: 6-2066

ba3 Sample ID: 0-1764L5075

ba3 Sample ID: 0-1764L5078

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	lethod	Prep Type
/ erkn(orob(taSoic aciB)/ g. A8	4LC		116	0144	SdfN	1	- 7	Gh-N -002j	Totanfp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	616		116	0L6j	SdfN	1	(∃h- N -002j	Totanfp A
/ erkn(oro&exaSoic aciB)/ gHxA8	13		116	0LPC	SdfN	1	(∃h- N -002j	Totanfip A
/ erkn(oro&e9taSoic aciB)/ gH9A8	410		116	0LPP	SdfN	1	(∃h- N -002j	Totanfp A
/ erkn(orooctaSoic aciB)/ gOA8	Cl2		116	01P2	SdfN	1	(∃h- N -002j	Totanfp A
/ erkn(oroSoSaSoic aciB)/ gpA8	1L1	J	116	01C3	SdfN	1	(∃h- N -002j	Totanfp A
/ erkn(oro(SBecaSoic aciB)/ gUSA8	110	J	116	01P2	SdfN	1	(∃h- N -002j	Totanfp A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	0161	J	116	0L16	SdfN	1	(∃h- N -002j	Totanfp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	117	J.	116	0L12	SdfN	1	C	Gh- N -002j	Totanfp A
/erkn(orob(taSeh(nkoSate)/g.h8	PL7		116	0176	SdfN	1	(∃h- N -002j	Totanfp A
/enkn(oro&vexaSeh(nkoSate)/gHxh8	31		116	0174	SdfN	1	(∃h- N -002j	Totanfp A
/erkn(oro-1-&e9taSes(nkoSate	114	J	116	0106	SdfN	1	(∃h- N -002j	Totanfip A
)/ gH9h8 / erkn(orooctaSeh(nkoSate)/ gOh8	26		116	112	SdfN	1	C	Gh- N -002j	Totaníp A
lient Sample ID: 6-2-01						ba3 S	an	nple ID: 0	- 1764L50

T&is DetectioS h (mmarF Boes Sot iScn Be raBioc&emicantest res(nsL

TestAmerica hacrameSto

TestAmerica Job ID: 320-174C3-1 hD5:31-1-11P3j-004

ba3 Sample ID: 0-1764L5070

InieSt:h&aSSoSWGinsoS

/ royectfhite: I itF okgairbaSus gire TraiSiSd Area

Client Sample ID: 6-2-01 (Continued)

ba3 Sample ID: 0-1764L5072

ba3 Sample ID: 0-1764L5074

ba3 Sample ID: 0-1764L5079

ba3 Sample ID: 0-1764L50761

Analyte	Result Qualifier	Rb	MDb	Unit	Dil Fac D	Method	Prep Type
erkn(orob(taSoic aciB)/ g. A8	617 .	117	0142	SdfN		Gh-N -002j	Totanfp A
erkn(oro9eStaSoic aciB)/g/eA8	1C	1L7	0161	SdfN	1	Gh-NI-002j	Totarlip A
erkn(oro&exaSoic aciB)/gHxA8	13	1L7	01P2	SdfN	1	Gh-NI-002j	Totanfp A
erkn(oro&e9taSoic aciB)/gH9A8	jЮ	1L7	0LP4	SdfN	1	Gh-NI-002j	Totanfp A
erkn(orooctaSoic aciB)/gOA8	12	1L7	01.06	SdfN	1	Gh-NI-002j	Totarlip A
erkn(oroSoSaSoic aciB)/gpA8	2L1	1L7	0100	SdfN	1	Gh- N -002j	Totarlip A
erkn(orotetraBecaSoic aciB)/ gTeA8	0160 J	117	0L17	SdfN	1	Gh-NI-002j	Totarlip A
erkn(oro-S-&exaBecaSoic aciB	2LC .	117	0L11	SdfN	1	Gh-NI-002j	Totarlip A
/gHxDA8 erkn(orob(taSeh(nkoSate)/g.h8 erkn(oro&exaSeh(nkoSate)/gHxh8	414 42	1L7 1L7	,	SdfN SdfN	1	Gh-NI-002j Gh-NI-002j	Totanfp A Totanfp A
erkn(oro-1-&e9taSes(nkoSate /gH9h8	112 J	117	0100	SdfN	1	Gh-N -002j	Totarlip A
erkn(orooctaSeh(nkoSate)/gOh8	16	1L7	112	SdfN	1	Gh-NI-002j	Totanfp A
erkn(orooctaSeh(nkoSamiBe)gOhA8	12	117	0lj 6	SdfN	1	Gh-NI-002j	Totanfp A

Client Sample ID: 8-L858

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	110	J	116	0144	SdfN	1		Gh-NI-002j	Totanfp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	114	J	116	0164	SdfN	1		Gh- N -002j	Totanfp A
/ erkn(oro&exaSoic aciB)/ gHxA8	217		116	0LPj	SdfN	1		Gh- N -002j	Totanfp A
/ erkn(orooctaSoic aciB)/ gOA8	116		116	0LP1	SdfN	1		Gh- N -002j	Totanfp A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	0lj 0	J	116	0Ľ16	SdfN	1		Gh- N -002j	Totanfp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	1Ľ1	J .	116	0L12	SdfN	1		Gh-NI-002j	Totarlip A
/en/n(orob(taSeh(nkoSate)/g.h8	1Lj	J	116	0L7P	SdfN	1		Gh- N -002j	Totanfp A
/enkn(oro&exaSeh(nkoSate)/gHxh8	j l2		116	0173	SdfN	1		Gh- N -002j	Totanfp A
/erkn(oro-1-&e9taSes(nkoSate)/αH9h8	0L77	J	116	0LC7	SdfN	1		Gh-NI-002j	Totanfp A
/enkn(orooctaSeh(nkoSate)/gOh8	21		116	112	SdfN	1		Gh- N -002j	Totaníp A
/erkn(orooctaSeh(nkoSamiBe)gOhA8	PL1		116	0LC1	SdfN	1		Gh- N -002j	Totarlip A

Client Sample ID: L8-2684

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	213		117	0141	SdfN	1	-	Gh-N -002j	Totarfip A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	2lj		1L7	0176	SdfN	1		Gh-NI-002j	Totaníp A
/ erkn(oro&exaSoic aciB)/ gHxA8	2LP		1L7	0LP1	SdfN	1		Gh-NI-002j	Totarlip A
/ erkn(oro&e9taSoic aciB)/ gH9A8	0172	J	1L7	0LP3	SdfN	1		Gh-NI-002j	Totanfp A
/ erkn(orooctaSoic aciB)/ gOA8	313		1L7	0LC7	SdfN	1		Gh-NI-002j	Totaníp A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	0163	J	1L7	0Ľ17	SdfN	1		Gh-NI-002j	Totaníp A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	117		117	0L11	SdfN	1		Gh- N -002j	Totarlip A
/erkn(oro&vexaSeh(nkoSate)/gHxh8	1LC	J	1L7	0LP6	SdfN	1		Gh-NI-002j	Totanfp A

Client Sample ID: 6-26-L

1	Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
	/ erkn(orob(taSoic aciB)/ g. A8	710		116	0142	SdfN	1	_	Gh-N -002j	Totanfp A
	/ erkn(oro9eStaSoic aciB)/ g/ eA8	24		116	0162	SdfN	1		Gh- N -002j	Totanfp A
	/ erkn(oro&exaSoic aciB)/ gHxA8	2C		116	0LP3	SdfN	1		Gh-N -002j	Totarfp A

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/ royectfhite: I itF okgairbaSus gire TraiSiSd Area

Client Sample ID: 6-26-L (Continued)

ba3 Sample ID: 0-1764L50761

ba3 Sample ID: 0-1764L50766

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3

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac D	Method	Prep Type
/ erkn(oro&e9taSoic aciB)/ gH9A8	Plj		116	0LP4	SdfN	1	Gh-N -002j	Totarlip A
/ erkn(orooctaSoic aciB)/ gOA8	14		116	01.06	SdfN	1	Gh- N -002j	Totanfp A
′erkn(oroSoSaSoicaciB)/gpA8	314		116	0LC1	SdfN	1	Gh-NI-002j	Totanfp A
/ erkn(oroBecaSoic aciB)/ gDA8	113	J	116	0141	SdfN	1	Gh-NI-002j	Totanfp A
erkn(oro(SBecaSoic aciB)/gUSA8	0LPC	J	116	01.06	SdfN	1	Gh-NI-002j	Totanfp A
erkn(oroBoBecaSoic aciB)/gDoA8	110	J	116	0lj 4	SdfN	1	Gh-NI-002j	Totarlip A
erkn(orotetraBecaSoic aciB)/gTeA8	0LP0	J	116	0Ľ17	SdfN	1	Gh-NI-002j	Totarlip A
erkn(oro-S-&exaBecaSoic aciB / gHxDA8	114	J .	116	0L11	SdfN	1	Gh-N -002j	Totarlip A
erkn(orob(taSeh(nkoSate)/g.h8	Clj		116	0L7j	SdfN	1	Gh-NI-002j	Totanfp A
enkn(oro&exaSeh(nkoSate)/gHxh8	47		116	0L71	SdfN	1	Gh-NI-002j	Totarlip A
erkn(oro-1-&e9taSes(nkoSate /qH9h8	216		116	0100	SdfN	1	Gh-N -002j	Totarlip A
erkn(orooctaSeh(nkoSate)/gOh8	C7		116	112	SdfN	1	Gh-NI-002j	Totanfip A
erkn(orooctaSeh(nkoSamiBe)gOhA8	016P	J	116	0Ц 6	SdfN	1	Gh-NI-002j	Totanfp A

Client Sample ID: 8-5825

Analyte **Result Qualifier** Dil Fac D Method Rb MDb Unit Prep Type 117 / erkn(orob(taSoic aciB)/g. A8 410 0L42 SdfN 1 Gh-N -002j Totanfp A / erkn(oro9eStaSoic aciB)/ g/ eA8 4Ц 1L7 0L60 SdfN 1 Gh-N -002j Totanfp A / erkn(oro&exaSoic aciB)/ gHxA8 613 1L7 0LP2 SdfN 1 Gh-N -002j Totanfp A / erkn(oro&e9taSoic aciB)/ gH9A8 0L63 J 1L7 0LP3 SdfN Gh-N -002j Totanfp A 1 / erkn(orooctaSoic aciB)/ gOA8 Gh-N -002i Totanfp A 310 1L7 0LC7 SdfN 1 / erkn(oroBecaSoic aciB)/ gDA8 OLPP J Gh-N -002j Totanfp A 1L7 0L40 SdfN 1 / erkn(oro(SBecaSoic aciB)/ gUSA8 0L7P J 1L7 0LC7 SdfN Gh-N -002j Totanfp A 1 Gh-N -002j / erkn(oroBoBecaSoic aciB)/ gDoA8 0L63 J 1L7 Totanfp A 0Lj 3 SdfN 1 / erkn(orotetraBecaSoic aciB)/ gTeA8 0L60 J 117 0L17 SdfN 1 Gh-N -002j Totanfp A 1LC J. 117 0L11 SdfN 1 Gh-N -002j Totanfp A / erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8 /enkn(orob(taSeh(nkoSate)/g.h8 Gh-N -002j 312 117 0L74 SdfN 1 Totanfp A Gh-N -002j /erkn(oro&exaSeh(nkoSate)/gHxh8 1j 1L7 0LP6 SdfN Totanfp A 1 1L4 J Gh-N -002j / erkn(oro-1-&e9taSes(nkoSate 117 0LCi SdfN 1 Totanfp A)/gH9h8 g Gh-N -002j / erkn(orooctaSe h(nkoSate)/gOh8 1L7 1L2 SdfN 1 Totanfp A

Client Sample ID: 8-5525

ba3 Sample ID: 0-1764L5076-

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	410		117	0142	SdfN	1	-	Gh-N -002j	Totaníp A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	jĻj		1L7	0161	SdfN	1		Gh- N -002j	Totaníp A
/ erkn(oro&exaSoic aciB)/ gHxA8	610		1L7	01P2	SdfN	1		Gh- N -002j	Totaníp A
/ erkn(oro&e9taSoic aciB)/ gH9A8	110	J	1L7	0LP4	SdfN	1		Gh-NI-002j	Totanfp A
/ erkn(orooctaSoic aciB)/ gOA8	314		1L7	0106	SdfN	1		Gh- N -002j	Totarlip A
/ erkn(oroBecaSoic aciB)/ gDA8	0174	J	1L7	0140	SdfN	1		Gh- N -002j	Totarlip A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	0L3C	J	117	0L17	SdfN	1		Gh- N -002j	Totarlip A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	210		117	0L11	SdfN	1		Gh-N -002j	Totarlip A
/erkn(orob(taSeh(nkoSate)/g.h8	3LC		117	0L74	SdfN	1		Gh- N -002j	Totarlip A
/enkn(oro&exaSeh(nkoSate)/gHxh8	12		117	0L70	SdfN	1		Gh-NI-002j	Totarfip A
/erkn(oro-1-&e9taSes(nkoSate)/gH9h8	0L71	J	1L7	0LCj	SdfN	1		Gh-N -002j	Totarfip A

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/ royectfhite: I itF okgairbaSus gire TraiSiSd Area

Client Sample ID: 8-5525 (Continued)

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac	D	Method	Prep Type
/enkn(orooctaSeh(nkoSate)/gOh8	46		117	112	SdfN	1	-	Gh-NI-002j	Totarlip A

Client Sample ID: 6-28-0

Analyte	Result	Qualifier	Rb	MDb	Unit	Dil Fac D	Method	Prep Type
/ erkn(orob(taSoic aciB)/g. A8	j [1		117	0142	SdfN		Gh-N -002j	Totarfip A
/ erkn(oro9eStaSoic aciB)/ g/ eA8	12		117	0610	SdfN	1	Gh-NI-002j	Totarlip A
/ erkn(oro&exaSoic aciB)/ gHxA8	14		117	0LP1	SdfN	1	Gh-NI-002j	Totarlip A
′erkn(oro&e9taSoic aciB)/gH9A8	412		117	01P3	SdfN	1	Gh-NI-002j	Totarfip A
/ erkn(orooctaSoic aciB)/ gOA8	ac		117	0LC7	SdfN	1	Gh-NI-002j	Totarfip A
′erkn(oroSoSaSoic aciB)/gpA8	112	J	117	0lj 6	SdfN	1	Gh-NI-002j	Totarlip A
/ erkn(oro(SBecaSoic aciB)/ gUSA8	0LP1	J	117	0LC7	SdfN	1	Gh-NI-002j	Totarfip A
/ erkn(orotetraBecaSoic aciB)/ gTeA8	114	J	117	0Ľ17	SdfN	1	Gh-NI-002j	Totarlip A
/ erkn(oro-S-&exaBecaSoic aciB)/ gHxDA8	1L3	J.	117	0L11	SdfN	1	Gh- N -002j	Totanfp A
erkn(orob(taSeh(nkoSate)/g.h8	PL6		117	0173	SdfN	1	Gh-NI-002j	Totarfip A
/enkn(oro&exaSeh(nkoSate)/gHxh8	37		117	0LP6	SdfN	1	Gh-NI-002j	Totarlip A
/erkn(oro-1-&e9taSes(nkoSate)/gH9h8	1Ц	J	117	010	SdfN	1	Gh-N -002j	Totarlip A
/enkn(orooctaSeh(nkoSate)/gOh8	jj		1L7	112	SdfN	1	Gh- N -002j	Totanfp A

TestAmerica Job ID: 320-174C3-1 hD5:31-1-11P3j-004

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I nieSt: h & aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

Client Sample ID: 18MM 4 Date Cdlle/ te6: 04v17v18 05:27

Date Re/ eihe6: 04v22v18 11:1r

xetPd6:cS-LC-002r-feWalud	Whate6v(6Wd/	aWadns							
) nal(te	Result Oual		x DL	Qnit	D	fWepaWe/6) nal(Ue6	Dil Ba/	5
feWaludWalbutandi/a/i6FfBA).	8 z 7 A	117	0140	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	
feWaludWalpentandi/a/i6FfBfe).	13	117	0L7P	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	6
feWaludWalPeoandi/a/i6FfByo).	1M	117	0109	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	_
feWaludWalPeptandi/a/i6FfByp).	4zM	117	0LP1	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	7
feWaludWald/tandi/a/i6FfB9).	7 z 3	117	0100	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	
feWaludWalndnandi/a/i6FfBN).	0z5M J	117	0Ļi 7	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	8
/ erknuorodecaSoic acid (/ gDA)	ND	117	0139	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	
feWaludWalun6e/andi/a/i6	OzMM J	117	0100	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	9
Ff BQn).									
feVMudVul6d6e/andi/a/i6	1z1 J	117	0lj 1	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	10
IF BDd) .	ND	117	0147	S8f6			0; f10f1000.01	1	
/ erknuorotridecaSoic Acid (/ gTriA)			0147			04f2j f1C0P:4j	0j f10f1C02:21		44
feWaludWaltetWal6e/andi/a/i6 FfBTe).	0z81 J	117	0117	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	
feWaludWal-n-Peoa6e/andi/a/i6	1z1 JA	117	0111	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	40
If By oD).			0EI I	0010		0 H2j H 0 01 . Ij	0,11011002.21		12
/ erknuoro-S-octaSdecaSoic acid	ND	117	0Ļ 9	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	
(/ gODA)									13
f eWaludWalbutane SulHanate Ff BAS.	M25	117	0L71	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	-
f eWudWdPeoane SulHinate	37	117	0LPP	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	14
IF By oS.		417	0.00	0010			0: (40(40000.04		
feWaludWal-1-PeptanesulHdnate	125	117	013	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	15
If By pS. / erknuorodecaSe sunkoSate (/ gDh)	ND	117	1Ľ1	S8f6		04f2j f1C0P:4j	0j f10f1C02:21	1	
f eVMudVuld/ tane SulHunate Ff B9 S.	4M	117	111			04f2j f1C0P:4j	,	1	
/ erknuorooctaSe hunkoSamide (gOhA)	ND	117	Oli C	S8f6		, ,	0j f10f1C02:21	1	
Isotope Dilution	%Recovery Qual					Prepared	Analyzed	Dil Fac	
13C8 FOSA	6 *	25 - 150					05/10/16 02:21	1	
13C4 PFBA	61	25 - 150					05/10/16 02:21	1	
13C2 PFHxA	98	25 - 150					05/10/16 02:21	1	
13C4 PFOA	100	25 - 150					05/10/16 02:21	1	
13C5 PFNA	89	25 - 150					05/10/16 02:21	1	
13C2 PFDA	78	25 - 150					05/10/16 02:21	1	
13C2 PFUnA	83	25 - 150					05/10/16 02:21	1	
13C2 PFDoA	89	25 - 150					05/10/16 02:21	1	
1802 PFHxS	121	25 - 150					05/10/16 02:21	1	
13C4 PFOS	127	25 - 150					05/10/16 02:21	1	
13C4-PFHpA	110	25 - 150					05/10/16 02:21	1	
13C5 PFPeA	89	25 - 150					05/10/16 02:21	1	
	03	20-700				57/20/10 01.40	00/10/10 02.21	,	

Client Sample ID: 18M7r4 Date Cdlle/ te6: 04v17v18 05:32 Date Re/ eihe6: 04v22v18 11:1r

x etPd6: c S-LC-002r - f eWalud	Mhate6y(6	6Wd/aWødns							
) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
feWalludWalbutandi/a/i6FfBA).	r zr	Α	117	0142	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
feWaludWalpentandi/a/i6FfBfe).	13		1L7	0190	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
feWalludWalPeoandi/a/i6FfByo).	17		1L7	01P2	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
feWalludWalPeptandi/a/i6FfByp).	4 z r		1L7	0LP3	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1
feWaludWald/tandi/a/i6FfB9).	7 z 5		117	0LC7	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	1

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Lab Sample ID: 320-17483-2

TestAmerica Job ID: 320-174C3-1 hD5:31-1-11P3j-004

Lab Sample ID: 320-17483-1

x atWo: c ateW

x atWo: c ateW

I nieSt: h &aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

Client Sample ID: 18M7r4 Date Cdlle/ te6: 04v17v18 05:32 Date Re/ eihe6: 04v22v18 11:1r

TestAmerica Job ID: 320-174C3-1 hD5: 31-1-11P3j -004

Lab Sample ID: 320-17483-2 x atWb: c ateW

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba
feWaludWalndnandi/a/i6FfBN).	1 z 4	J	117	0100	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	-
/ erknuorodecaSoic acid (/ gDA)	ND		117	0140	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
/erknuorouSdecaSoic acid (/gpSA)	ND		117	0LC7	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
feWuludWul6d6e/andi/a/i6 FfBDd).	1 z 0	J	117	0lj 3	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
/ erknuorotridecaSoic Acid (/ gTriA)	ND		117	0Ц О	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
feWaludWaltetWal6e/andi/a/i6 FfBTe).	1 z 2	J	117	0Ľ17	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
eWaludWal-n-Peoa6e/andi/a/i6 ₹ByoD).	1 z M	JA	117	0L11	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
ˈeⅧudⅧu-n-d/tan6e/andi/a/i6 ₹B9D).	0 z 5M	J	117	0LC1	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
feWaludWalbutane SulHanate FFBAS.	5 z 0		117	0174	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
[:] eWiludWilPeoane SulHdnate ₹ By oS.	45		117	0170	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
feWaludWal-1-PeptanesulHdnate FfBypS.	2 z 3		117	010	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
erknuorodecaSe sunkoSate (/ gDh)	ND		117	1L1	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
eWiludWild/tane SulHinate IF B9 S.	r1		117	112	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	
feWuludWuld/tane SulHulnami6e FB9 S).	4z 3		117	0lj 7	S8f6		04f2j f1C0P:4j	0j f10f1C02:42	

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C8 FOSA	4	*	25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C4 PFBA	65		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C2 PFHxA	98		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C4 PFOA	94		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C5 PFNA	73		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C2 PFDA	62		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C2 PFUnA	69		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C2 PFDoA	73		25 - 150	04/25/16 07:45	05/10/16 02:42	1
18O2 PFHxS	117		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C4 PFOS	127		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C4-PFHpA	110		25 - 150	04/25/16 07:45	05/10/16 02:42	1
13C5 PFPeA	96		25 - 150	04/25/16 07:45	05/10/16 02:42	1

Client Sample ID: 5r 443 Date Cdlle/ te6: 04v17v18 10:44 Date Re/ eihe6: 04v2v18 11:1r

) nal(te	Result C	DualiHieW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
feWalludWalbutandi/a/i6FfBA).	3 z 4 A	A	119	0143	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
feWalludWalpentandi/a/i6FfBfe).	r z 4		119	0193	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
feWaludWalPeoandi/a/i6FfByo).	r z 0		119	0LP4	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
feWaludWalPeptandi/a/i6FfByp).	2 z 1		119	0LPj	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
feWaludWald/tandi/a/i6FfB9).	372		119	0LP0	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuoroSoSaSoic acid (/ gNA)	ND		119	0LC1	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorodecaSoic acid (/ gDA)	ND		119	0141	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorouSdecaSoic acid (/ gpSA)	ND		119	0LP0	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorododecaSoic acid (/ gDoA)	ND		119	OLji j	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		119	0li 2	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	1

TestAmerica hacrameSto

Lab Sample ID: 320-17483-3

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x atWo: c ateW

I nieSt: h & aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

Client Sample ID: 5r 443 Date Cdlle/ te6: 04v17v18 10:44 Date Re/ eihe6: 04v2v18 11:1r

TestAmerica Job ID: 320-174C3-1 hD5: 31-1-11P3j -004

Lab Sample ID: 320-17483-3 x atWb: c ateW

5 6 7

) nal(te	Result	OualiHieW	RL	x DL	Qnit	D	fWe/pa₩e/6) nal(Ue6	Dil Ba
feWaludWaltetWal6e/andi/a/i6	0 z 4M	J	119	0L19	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
FFBTe).									
feWaludWal-n-Peoa6e/andi/a/i6	122	JA	1L9	0L12	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
FF By oD).	ND		119	0100	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
/ erknuoro-S-octaSdecaSoic acid (/ gODA)	ND		119	0103	3010		0412j 1100P.4j	0/11/2110/20.12	
feWaludWalbutane SulHanate Ff BAS.	2z0		119	0L7C	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
feWaludWalPeoane SulHanate	r z 4		119	0L71	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
Ff By oS.							, ,	,	
/erknuoro-1-&eHtaSesunkoSate	ND		119	0LCP	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
(/gUHh)									
/erknuorodecaSesunkoSate(/gDh)	ND		119		S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
feWaludWald/tane SulHalnate FfB9S.	r zM		119	112	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
/erknuorooctaSehunkoSamide(gOhA)	ND		119	0100	S8f6		04f2j f1C0P:4j	0j f12f1C20:12	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	8	*	25 - 150				04/25/16 07:45	05/12/16 20:12	
13C4 PFBA	77		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C2 PFHxA	114		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C4 PFOA	107		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C5 PFNA	101		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C2 PFDA	90		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C2 PFUnA	89		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C2 PFDoA	87		25 - 150				04/25/16 07:45	05/12/16 20:12	
1802 PFHxS	117		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C4 PFOS	144		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C4-PFHpA	119		25 - 150				04/25/16 07:45	05/12/16 20:12	
13C5 PFPeA	119		25 - 150				04/25/16 07:45	05/12/16 20:12	

Client Sample ID: 411788 Date Cdlle/ te6: 04vl7vl8 11:r 4 Date Re/ eihe6: 04v2vl8 11:1r

Lab Sample ID: 320-17483-4 x atWb: c ateW

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
feWaludWalbutandi/a/i6FfBA).	3 z 7	A	117	0140	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
feWalludWalpentandi/a/i6FfBfe).	228		117	0L7P	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
feWaludWalPeoandi/a/i6FfByo).	3 z 7		117	01C9	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
feWalludWalPeptandi/a/i6FfByp).	02 58	J	117	0LP0	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
feWaludWald/tandi/a/i6FfB9).	2z 3		117	0100	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/erknuoroSoSaSoicacid (/gNA)	ND		117	0lj P	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorodecaSoic acid (/ gDA)	ND		117	0139	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/erknuorouSdecaSoicacid (/gpSA)	ND		117	0100	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorododecaSoic acid (/ gDoA)	ND		117	0lj 1	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		117	0147	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuorotetradecaSoic acid (/ gTeA)	ND		117	0L1P	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
feWaludWal-n-Peoa6e/andi/a/i6 FfByoD).	1 z 4	JA	117	0L11	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/ erknuoro-S-octaSdecaSoic acid (/ gODA)	ND		117	0lj 9	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1
/erknuorobutaSehunkoSate(/gBh)	ND		117	0L71	S8f6		04f2j f1C0P:4j	0j f12f1C20:33	1

TestAmerica hacrameSto

RL

117

1L7

117

117

117

Limits

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

x DL Qnit

OLPC S8f6

0LC3 S8f6

OLI C S8f6

111

1L1 S8f6

S8f6

D

f WepaWe6

04f2j f1C0P:4j

04f2j f1C0P:4j

04f2j f1C0P:4j

04f2j f1C0P:4j

04f2j f1C0P:4j

I nieSt: h & aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wl/aWl/dns FCdntinue6.

Result OualiHeW

1zr J

ND

ND

ND

ND

8

73

110

122

96

86

76

70

124

140

124

115

%Recovery

Qualifier

Client Sample ID: 411788 Date Cdlle/ te6: 04v17v18 11:r 4 Date Re/ eihe6: 04v22v18 11:1r

f eWiludWilPeoane SulHinate

/ erknuoro-1-&eHtaSesunkoSate

/ erknuorodecaSe sunkoSate (/ gDh)

/ erknuorooctaSe hunkoSate (/ gOh)

/ erknuorooctaSe hunkoSamide (gOhA)

) nal(te

If By oS.

(/gUHh)

Isotope Dilution

13C8 FOSA

13C4 PFBA

13C2 PEHXA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA

13C2 PFDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

TestAmerica Job ID: 320-174C3-1 hD5: 31-1-11P3j -004

Lab Sample ID: 320-17483-4 x atWo: c ateW

) nal(Ue6

0j f12f1C20:33

0j f12f1C20:33

0j f12f1C20:33

0j f12f1C20:33

0j f12f1C20:33

Dil Ba/

1

1

1

1

1

1

1

1

1

1

1

1

1

Dil Fac

Client Sample ID: 4r 45M4 Date Cdlle/ te6: 04v17v18 13:33 Date Re/ eihe6: 04v2v18 11:1r

x etPd6: c S-LC-002r - f eWaludWhate6 y (6Wal/aWadns Result OualiHeW RL x DL Qnit f WepaWe6) nal(te D) nal(Ue6 Dil Ba/ 117 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 feWaludWalbutandi/a/i6FfBA). 225 A 0142 1 0j f12f1C20:j 4 f eWaludWalpentandi/ a/i6 Ff Bf e). r **z**4 117 0191 S8f6 04f2j f1C0P:4j 1 feWaludWalPeoandi/a/i6FfByo). 8**z**1 117 0IP2 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1 117 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 feWaludWalPeptandi/a/i6FfByp). 220 0IP4 1 1L7 0109 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 feWaludWold/tandi/a/i6FfB9). 2π M 1 S8f6 / erknuoroSoSaSoic acid (/ gNA) ND 117 0100 04f2j f1C0P:4j 0j f12f1C20:j 4 1 / erknuorodecaSoic acid (/ gDA) ND 1L7 0141 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1 / erknuorouSdecaSoic acid (/ gp SA) ND 117 0109 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1 / erknuorododecaSoic acid (/ gDoA) ND 117 0Lj 4 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1 / erknuorotridecaSoic Acid (/ gTriA) ND 117 0Li 1 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1 feWwludWaltetWal6e/andi/a/i6 0z71 J 1L7 0L17 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1 FFBTe). 117 0L11 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 f eWaludWal-n-Peoa6e/ andi/ a/ i6 0z82 JA 1 If By oD). 04f2j f1C0P:4j 0j f12f1C20:j 4 ND 117 0LC2 S8f6 / erknuoro-S-octaSdecaSoic acid 1 (/ gODA) f eWiludWilbutane SulHinate FF BAS. 04f2j f1C0P:4j 1z3 J 117 0L7j S8f6 0j f12f1C20:j 4 1 f eWiudWiPeoane SulHinate 4**7**2 117 0L70 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1 If By oS. ND OLCC S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 117 1 / erknuoro-1-&eHtaSesunkoSate (/gUHh) / erknuorodecaSe sunkoSate (/ gDh) ND 1L7 1L1 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1 04f2j f1C0P:4j f eWww.dWww.d/ tane SulHdnate FF B9 S. 8zM 117 112 S8f6 0j f12f1C20:j 4 1 / erknuorooctaSe hunkoSamide (gOhA) ND 1L7 04 9 S8f6 04f2j f1C0P:4j 0j f12f1C20:j 4 1

TestAmerica hacrameSto

 Prepared
 Analyzed

 04/25/16 07:45
 05/12/16 20:33

 04/25/16 07:45
 05/12/16 20:33

04/25/16 07:45 05/12/16 20:33

04/25/16 07:45 05/12/16 20:33

04/25/16 07:45 05/12/16 20:33

04/25/16 07:45 05/12/16 20:33

04/25/16 07:45 05/12/16 20:33

04/25/16 07:45 05/12/16 20:33

04/25/16 07:45 05/12/16 20:33 1 04/25/16 07:45 05/12/16 20:33 1 04/25/16 07:45 05/12/16 20:33 1 04/25/16 07:45 05/12/16 20:33 1 **Lab Sample ID: 320-17483-r**

x atMo: c ateW

I nieSt: h & aSSoS WG insoS / royectfhite: I itFokgairbaS. s gire TraiSiS8 Area TestAmerica Job ID: 320-174C3-1 hD5:31-1-11P3j-004

Lab Sample ID: 320-17483-8

Client Sample ID: 4r 45M4 Date Cdlle/ te6: 04v17v18 13:33 Date Re/ eihe6: 04v22v18 11:1r

Isotope Dilution	%Recovery Quali	fier Limits	Prepared Analyzed	Dil Fac
13C8 FOSA	3 *	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C4 PFBA	80	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C2 PFHxA	121	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C4 PFOA	97	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C5 PFNA	85	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C2 PFDA	96	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C2 PFUnA	115	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C2 PFDoA	109	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
18O2 PFHxS	112	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C4 PFOS	136	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C4-PFHpA	122	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1
13C5 PFPeA	123	25 - 150	04/25/16 07:45 05/12/16 20:5	54 1

Client Sample ID: 12MB11

Date Cdlle/ te6: 04v17v18 1r:0M Date Re/ eihe6: 04v22v18 11:1r

x etPd6: c S-LC-002r - f eVMud					• •	_	6 M M M M		
) nal(te		OualiHeW	RL	x DL		D	fWepaWe6) nal(Ue6	Dil Ba/
feWaludWalbutandi/a/i6FfBA).	4z8	Α	119		S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
feWaludWalpentandi/a/i6FfBfe).	5 z 5		119	0L9j	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
feWalludWolPeoandi/a/i6FfByo).	13		119	0LPC	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
feWaludWalPeptandi/a/i6FfByp).	4z0		119	0LPP	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
feWaludWald/tandi/a/i6FfB9).	872		119	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
feWaludWalndnandi/a/i6FfBN).	1 z 1	J	119	0LC3	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
/ erknuorodecaSoic acid (/ gDA)	ND		119	0142	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
feWuludWulun6e/andi/a/i6	1 z 0	J	119	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
Ff BQn).									
/ erknuorododecaSoic acid (/ gDoA)	ND		119	0lj C			04f2j f1C0P:4j	0j f10f1C0j :32	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		1L9	,	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
feWaludWaltetWal6e/andi/a/i6	0251	J	119	0Ľ19	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
Ff BTe).			410	0140	00/0		0.400 KAO 000 K	o: (10(100) 00	
feWaludWal-n-Peoa6e/andi/a/i6	12/	JA	119	0L12	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
FF By oD) . / erknuoro-S-octaSdecaSoic acid	ND		119	010	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
(/ gODA)	ND		113	θĿ	0010		0412j 11001.4j	0 1101100 .52	1
feWiludWilbutane SulHinate FFBAS.	M27		119	0179	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eWiludWiPeoane SulHinate	31		119	0174	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
Ff By oS.	•••						, j j	- j j -	
f eWiludWil-1-PeptanesulHinate	1z4	J	119	0LC9	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
Ff By pS.									
/erknuorodecaSesunkoSate(/gDh)	ND		119	112	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
f eWaludWold/ tane SulHdnate Ff B9 S.	25		119	112	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
/erknuorooctaSehunkoSamide(gOhA)	ND		119	0LC2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :32	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	4	*	25 - 150				04/25/16 07:45	05/10/16 05:32	1
13C4 PFBA	67		25 - 150				04/25/16 07:45	05/10/16 05:32	1
13C2 PFHxA	98		25 - 150				04/25/16 07:45	05/10/16 05:32	1
13C4 PFOA	91		25 - 150				04/25/16 07:45	05/10/16 05:32	1
13C5 PFNA	68		25 - 150				04/25/16 07:45	05/10/16 05:32	1
13C2 PFDA	51		25 - 150				04/25/16 07:45	05/10/16 05:32	1
13C2 PFUnA	54		25 - 150				04/25/16 07:45	05/10/16 05:32	1

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5 6 7

x atWo: c ateW

13 14

5/18/2016

Lab Sample ID: 320-17483-r x atWo: c ateW

I nieSt: h & aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

Client Sample ID: 12MB11 Date Cdlle/ te6: 04v17v18 1r:0M Date Re/ eihe6: 04v22v18 11:1r

Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	59	25 - 150	04/25/16 07:45	05/10/16 05:32	1
18O2 PFHxS	124	25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C4 PFOS	121	25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C4-PFHpA	101	25 - 150	04/25/16 07:45	05/10/16 05:32	1
13C5 PFPeA	92	25 - 150	04/25/16 07:45	05/10/16 05:32	1

Client Sample ID: 12M230

Date Cdlle/ te6: 04v17v18 18:3M Date Re/ eihe6: 04v22v18 11:1r

TestAmerica Job ID: 320-174C3-1 hD5:31-1-11P3j-004

Lab Sample ID: 320-17483-8 x atMb: c ateW

Lab Sample ID: 320-17483-M

x atMb: c ateW

5

6

x etPd6: c S-LC-002r - f eVMud) nal(te		OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
feWnludWnlbutandi/a/i6FfBA).	57		117		S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
feWiludWilpentandi/a/i6 FfBfe).	18		1L7	0191	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
feWaludWalPeoandi/a/i6 Ff By o).	13		117	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
feWaludWalPeptandi/a/i6 Ff Byp).	r 20		1L7	0LP4	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
feWaludWald/tandi/a/i6FfB9).	12		1L7	01C9	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
feWaludWalndnandi/a/i6FfBN).	2 z 1		1L7	0100	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erknuorodecaSoic acid (/ gDA)	ND		1L7	0141	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erknuorouSdecaSoic acid (/ gp SA)	ND		11.7	01C9	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erknuorododecaSoic acid (/ gDoA)	ND		117	0Ļi 4	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		117	0Ļ 1	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
feWiludWiltetWil6e/andi/a/i6	0z50	J	117	0Ľ17	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
FFBTe).							, ,		
feWaludWal-n-Peoa6e/andi/a/i6	228	Α	1L7	0L11	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
Ff By oD).									
/ erknuoro-S-octaSdecaSoic acid	ND		117	0LC2	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
(/ gODA) feWiludWilbutane SulHinate Ff BAS.	4z4		117	017;	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eVilud WiPeoane SulHunate	44		117	,	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
Fevenua wa Peoane Sul Funate FFBy oS.	42		ΠĽ	010	3010		0412j 1100F.4j	0 1101100 .] 3	1
feWaludWal-1-PeptanesulHanate	122	J	117	0100	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
Ff By pS.		-					, ,	, ,,	
/erknuorodecaSesunkoSate(/gDh)	ND		1L7	1Ľ1	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
feWaludWald/tane SulHdnate FfB9S.	15		1L7	112	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
f eWaludWald/ tane SulHdnami6e	12		1L7	0lj 9	S8f6		04f2j f1C0P:4j	0j f10f1C0j :j 3	1
FB9S).									
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	2	*	25 - 150				04/25/16 07:45	05/10/16 05:53	1

Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	2	*	25 - 150
13C4 PFBA	61		25 - 150
13C2 PFHxA	93		25 - 150
13C4 PFOA	84		25 - 150
13C5 PFNA	66		25 - 150
13C2 PFDA	57		25 - 150
13C2 PFUnA	57		25 - 150
13C2 PFDoA	56		25 - 150
18O2 PFHxS	117		25 - 150
13C4 PFOS	124		25 - 150
13C4-PFHpA	101		25 - 150
13C5 PFPeA	87		25 - 150

Prepared	Analyzed	Dil Fac
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1
04/25/16 07:45	05/10/16 05:53	1

TestAmerica hacrameSto

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I nieSt: h &aSSoS WG insoS / royectfh ite: I itF okgairbaS. s gire TraiSiS8 Area

x etPd6: c S-LC-002r - f eWaludWhate6 y (6Wal/aWadns

Client Sample ID: r 24r 8r Date Cdlle/ te6: 04v17v18 1M2r Date Re/ eihe6: 04v2v18 11:1r

TestAmerica Job ID: 320-174C3-1 hD5: 31-1-11P3j -004

Lab Sample ID: 320-17483-7 x atWb: c ateW

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
feWaludWalbutandi/a/i6FfBA).	1z0	JA	119	0144	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
feWaludWalpentandi/a/i6FfBfe).	1 z 4	J	119	0194	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
feWaludWalPeoandi/a/i6FfByo).	27		119	0LPj	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuoro&eHtaSoic acid (/ gUHA)	ND		119	0LPC	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
feWaludWald/tandi/a/i6FfB9).	125		119	0LP1	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuoroSoSaSoic acid (/ gNA)	ND		119	0LC2	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorodecaSoic acid (/ gDA)	ND		119	0142	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorouSdecaSoic acid (/ gpSA)	ND		119	0LP1	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorododecaSoic acid (/ gDoA)	ND		119	0lj C	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		119	0lj 2	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
feWaludWaltetWal6e/andi/a/i6 FfBTe).	0 z 0	J	119	0L19	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eWuludWul-n-Peoa6e/ andi/ a/i6 Ff By oD).	1 z 1	JA	119	0L12	S8f6		04f2j f1C0P:4j	0j f10f1C0C1j	1
/ erknoro-S-octaSdecaSoic acid (/ gODA)	ND		119	0LC4	S8f6		04f2j f1C0P:4j	0j f10f1C0C1j	1
f eWiludWilbutane SulHinate IF BAS.	1 <i>a</i> r	J	119	0L7P	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eWiludWilPeoane SulHinate If By oS.	r 2 2		119	0173	S8f6		04f2j f1C0P:4j	0j f10f1C0C1j	1
f eWiludWil-1-PeptanesulHinate If By pS.	0 2 77	J	119	0LC7	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
/erknuorodecaSesunkoSate(/gDh)	ND		119	112	S8f6		04f2j f1C0P:4j	0j f10f1C0C:1j	1
f eWuludWuld/ tane SulHulnate Ff B9 S.	21		1L9	112	S8f6		04f2j f1C0P:4j	0j f10f1C0C1j	1
feWaludWald/taneSulHdnami6e FB9S).	Met		119	0LC1	S8f6		04f2j f1C0P:4j	0j f10f1C0C1j	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	6	*	25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C4 PFBA	83		25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C2 PFHxA	102		25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C4 PFOA	96		25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C5 PFNA	85		25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C2 PFDA	99		25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C2 PFUnA	116		25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C2 PFDoA	114		25 - 150				04/25/16 07:45	05/10/16 06:15	1
18O2 PFHxS	131		25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C4 PFOS	132		25 - 150				04/25/16 07:45	05/10/16 06:15	1
13C4-PFHpA	100		05 450				04/25/16 07:45	05/10/16 06.15	1
	100		25 - 150				04/25/10 07.45	05/10/10 00.15	1

Client Sample ID: 4r 2Mir 7 Date Cdlle/ te6: 04v15v18 05:3r Date Re/ eihe6: 04v22v18 11:1r

) nal(te	Result OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
feWaludWalbutandi/a/i6FfBA).	223 A	117	0141	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
feWaludWalpentandi/a/i6FfBfe).	2 z r	1L7	0179	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
feWaludWalPeoandi/a/i6FfByo).	2zM	1L7	0LP1	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
feWaludWolPeptandi/a/i6FfByp).	0 z 72 J	1L7	0LP3	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
feWaludWold/tandi/a/i6FFB9).	3z3	1L7	0LC7	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
′erknuoroSoSaSoic acid (/ gNA)	ND	117	0Ļi 9	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1

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Lab Sample ID: 320-17483-5

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x atWo: c ateW

I nieSt: h & aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

Client Sample ID: 4r 2Mir 7 Date Cdlle/ te6: 04v15v18 05:3r Date Re/ eihe6: 04v2v18 11:1r

TestAmerica Job ID: 320-174C3-1 hD5: 31-1-11P3j -004

Lab Sample ID: 320-17483-5 x atWb: c ateW

) nal(te		OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
/ erknuorodecaSoic acid (/ gDA)	ND		117	0140	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/erknuorouSdecaSoicacid (/gpSA)	ND		117	0LC7	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorododecaSoic acid (/ gDoA)	ND		117	0lj 3	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorotridecaSoic Acid (/ gTriA)	ND		117	0IJ 0	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
feWaludWaltetWal6e/andi/a/i6	0 z 53	J	117	0比7	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
FFBTe).									
feWaludWal-n-Peoa6e/andi/a/i6 FfByoD).	1 <i>z</i> 7	Α	117	0L11	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuoro-S-octaSdecaSoic acid (/ gODA)	ND		117	0LC1	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/erknuorobutaSehunkoSate(/gBh)	ND		117	0L73	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
f eWludWlPeoane SulHinate If By oS.	128	J	117	0LP9	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/erknuoro-1-&eHtaSesunkoSate	ND		117	0LC4	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
(/gUHh) /erknuorodecaSesunkoSate(/gDh)	ND		117	1Ц	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorooctaSe hunkoSate (/ gOh)	ND		117	112	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
/ erknuorooctaSe hunkoSamide (gOhA)	ND		117	0Ц 7	S8f6		04f2j f1C0P:4j	0j f12f1C21:1j	1
Isotope Dilution	%Recovery	Qualifier	Limits	-			Prepared	Analyzed	Dil Fac
13C8 FOSA	8	*	25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C8 FOSA	7	*	25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C4 PFBA	76		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C4 PFBA	82		25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C2 PFHxA	95		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C2 PFHxA	119		25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C4 PFOA	89		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C4 PFOA	101		25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C5 PFNA	70		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C5 PFNA	83		25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C2 PFDA	64		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C2 PFDA	82		25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C2 PFUnA	69		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C2 PFUnA	88		25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C2 PFDoA	65		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C2 PFDoA	80		25 - 150				04/25/16 07:45	05/12/16 21:15	1
18O2 PFHxS	122		25 - 150				04/25/16 07:45	05/10/16 06:36	1
1802 PFHxS	124		25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C4 PFOS	120		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C4 PFOS	155	*	25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C4-PFHpA	99		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C4-PFHpA	120		25 - 150				04/25/16 07:45	05/12/16 21:15	1
13C5 PFPeA	101		25 - 150				04/25/16 07:45	05/10/16 06:36	1
13C5 PFPeA									

Client Sample ID: 12M124

Date Cdlle/ te6: 04v15v18 10:31 Date Re/ eihe6: 04v2v18 11:1r

xetPd6:cS-LC-002r-feWalud	Whate6y(6)	Wd∕aWødns							
) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	fWe/paWe/6) nal(Ue6	Dil Ba/
feWaludWalbutandi/a/i6FfBA).	720	Α	119	0142	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1

TestAmerica hacrameSto

Lab Sample ID: 320-17483-10

x atWo: c ateW

I nieSt: h & aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area TestAmerica Job ID: 320-174C3-1 hD5: 31-1-11P3j -004

Client Sample ID: 12M124 Date Cdlle/ te6: 04v15v18 10:31 Date Re/ eihe6: 04v2v18 11:1r

Lab Sample ID: 320-17483-10 x atWb: c ateW

nal(te	Result	OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/	
eWaludWalpentandi/a/i6FfBfe).	24		119	0192	S8f6	_	04f2j f1C0P:4j	0j f10f1C0Cj P	1	2
eWaludWalPeoandi/a/i6FfByo).	28		119	0LP3	S8f6		04f2j f1C0P:4j	0j f10f1C0C:j P	1	
eWaludWalPeptandi/a/i6FfByp).	Mar		119	0LP4	S8f6		04f2j f1C0P:4j	0j f10f1C0C.j P	1	5
eWaludWald/tandi/a/i6FfB9).	14		119	0LC9	S8f6		04f2j f1C0P:4j	0j f10f1C0C:j P	1	
eWaludWalndnandi/a/i6FfBN).	3z4		119	0LC1	S8f6		04f2j f1C0P:4j	0j f10f1C0C:j P	1	
eWaludWal6e/andi/a/i6FfBD).	123	J	119	0141	S8f6		04f2j f1C0P:4j	0j f10f1C0C:j P	1	
eWudWun6e/ andi/ a/ i6	0zWB	J	119	0L C 9	S8f6		04f2j f1C0P:4j	0j f10f1C0C;j P	1	
f BQn) .										
eWaludWal6d6e/andi/a/i6	1 z 0	J	119	0lj 4	S8f6		04f2j f1C0P:4j	0j f10f1C0C;j P	1	
f BDd) .					00/0					
erknuorotridecaSoic Acid (/ gTriA)	ND		119	0lj 1	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1	
eWaludWaltetWal6e/andi/a/i6	0zWD	J	119	0L17	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1	
BTe). eWaludWal-n-Peoa6e/andi/a/i6	4-4	JA	119	0111	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1	
By oD).	124	JA	113	ULI I	3010		0412j 1100F.4j	UJ HUHCUCJ P	1	
erknoro-S-octaSdecaSoic acid	ND		119	0LC2	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1	
gODA)							- · · _ j · · · - · · · · j	-, · · · · ·, ·		2
eWiludWilbutane SulHinate IF BAS.	8 z r		119	0L7j	S8f6		04f2j f1C0P:4j	0j f10f1C0C.j P	1	
eMudMiPeoane SulHinate	47		119	0171	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1	
f By oS.										
eWiludWil-1-PeptanesulHilnate	225		119	0100	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1	
f By pS.					00/0					
erknuorodecaSesunkoSate(/gDh)	ND		119	1L1	S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1	
eWaludWald/tane SulHainate Ff B9 S.	87		119		S8f6		04f2j f1C0P:4j	0j f10f1C0Cj P	1	
eWaludWald/tane SulHdnami6e B9 S).	0 5 M	J	119	0Ļ 9	S8f6		04f2j f1C0P:4j	0j f10f1C0C.j P	1	
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
3C8 FOSA	52		25 - 150				04/25/16 07:45	05/10/16 06:57	1	
3C4 PFBA	69		25 - 150				04/25/16 07:45	05/10/16 06:57	1	
3C2 PFHxA	102		25 - 150				04/25/16 07:45	05/10/16 06:57	1	
3C4 PFOA	119		25 - 150				04/25/16 07:45	05/10/16 06:57	1	

Client Sample ID: r 28r MB Date Cdlle/ te6: 04v15v18 11:28 Date Re/ eihe6: 04v22v18 11:1r

13C5 PFNA

13C2 PFDA

13C2 PFUnA

13C2 PFDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

x etPd6: c S-LC-002r - f eVMudV	hate6y(6Wul/aWoldns							
) nal(te	Result OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
feWaludWalbutandi/a/i6FFBA).	4z0 A	117	0142	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
feWaludWalpentandi/a/i6FfBfe).	4 z	117	0190	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
feWaludWalPeoandi/a/i6FfByo).	5z3	117	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
feWalludWalPeptandi/a/i6FfByp).	0 z 53 J	117	0LP3	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1
feWaludWald/tandi/a/i6FfB9).	3z0	117	0LC7	S8f6		04f2j f1C0P:4j	0j f10f1C0P:19	1

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

116

107

120

104

126

138

121

94

TestAmerica hacrameSto

04/25/16 07:45 05/10/16 06:57

04/25/16 07:45 05/10/16 06:57

04/25/16 07:45 05/10/16 06:57

04/25/16 07:45 05/10/16 06:57

04/25/16 07:45 05/10/16 06:57

04/25/16 07:45 05/10/16 06:57

04/25/16 07:45 05/10/16 06:57

04/25/16 07:45 05/10/16 06:57

Lab Sample ID: 320-17483-11

1

1

1

1

1

1

1

1

x atWo: c ateW

I nieSt: h &aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

x etPd6: c S-LC-002r - f eWludWhate6 y (6Wl/aWl/dns FCdntinue6.

Result OualiHeW

ND

OzMM J

0**z**7M J

0**z**53 J

ND

ND

372

1r

ND

8r

ND

5

74

98

95

63

65

79

89

120

116

107

99

Qualifier

%Recovery

1z4 J

0**±**50 J

128 JA

Client Sample ID: r 28r MB Date Cdlle/ te6: 04v15v18 11:28 Date Re/ eihe6: 04v22v18 11:1r

/ erknuoroSoSaSoic acid (/ gNA)

feWwludWul6d6e/andi/a/i6

feWaludWal6e/andi/a/i6FfBD). feWaludWalun6e/andi/a/i6

/ erknuorotridecaSoic Acid (/ gTriA)

f eWaludWal-n-Peoa6e/ andi/ a/ i6

f eWludWlbutane SulHinate Ff BAS.

feWwludWaltetWal6e/andi/a/i6

/ erknuoro-S-octaSdecaSoic acid

f eWiludWiPeoane SulHinate

f eWww.udWol-1-PeptanesulHdnate

/ erknuorodecaSe sunkoSate (/ gDh)

f eWludWld/ tane SulHinate Ff B9 S.

/ erknuorooctaSe hunkoSamide (gOhA)

) nal(te

Ff BQn) .

Ff BDd).

FFBTe).

If By oD).

(/ gODA)

If By oS.

Ff By pS.

Isotope Dilution

13C8 FOSA

13C4 PFBA

13C2 PFHxA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA

13C2 PEDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

Lab Sample ID: 320-17483-11 x atWo: c ateW

) nal(Ue6

0j f10f1C0P:19

04f2j f1C0P:4j 0j f10f1C0P:19

04f2j f1C0P:4j 0j f10f1C0P:19

04f2j f1C0P:4j 0j f10f1C0P:19

6

Dil Ba/

1

1

1

1

1

1

1

1

1

1

	8
	9

	2
1	3

1

1

1

1

1

1

1

1

x atMo: c ateW

04/25/16 07:45	05/10/16 07:19
04/25/16 07:45	05/10/16 07:19
04/25/16 07:45	05/10/16 07:19
04/25/16 07:45	05/10/16 07:19

Lab Sample ID: 320-17483-12

04/25/16 07:45 05/10/16 07:19

04/25/16 07:45 05/10/16 07:19

04/25/16 07:45 05/10/16 07:19

04/25/16 07:45 05/10/16 07:19

Client Sample ID: r 288MB

Date Re/ eihe6: 04v22v18 11:1r

nal(te	Result	OualiHeW	RL	x DL	Qnit	D	fWelpaWel6) nal(Ue6	Dil Ba/
eWaludWalbutandi/a/i6FFBA).	4z0	A	117	0142	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
eWaludWalpentandi/a/i6FfBfe).	r zr		117	0191	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
eWaludWalPeoandi/a/i6FfByo).	5 z 0		117	0LP2	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
eWaludWalPeptandi/a/i6FfByp).	1 z 0	J	117	0LP4	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
ˈeⅧudⅧud/tandi/a/i6FfB9).	3 z 4		117	0109	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
erknuoroSoSaSoic acid (/ gNA)	ND		117	0100	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
eWaludWal6e/andi/a/i6FfBD).	0 z 74	J	117	0140	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
erknuorouSdecaSoic acid (/ gpSA)	ND		117	01C9	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
erknuorododecaSoic acid (/ gDoA)	ND		117	0lj 4	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1
erknuorotridecaSoic Acid (/ gTriA)	ND		117	0Ļi 1	S8f6		04f2j f1C0P:4j	0j f10f1C0P:40	1

TestAmerica hacrameSto

RL

117

117

1L7

117

117

1L7

117

117

117

1L7

1L7

117

1L7

117

Limits

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

x DL Qnit

0LC0 S8f6

0L40 S8f6

0LC7 S8f6

0lj 3 S8f6

040 S8f6

0L17 S8f6

0111 S8f6

0LC1 S8f6

0L74 S8f6

S8f6

S8f6

0LP9 S8f6

0LCi

111

112 S8f6

047 S8f6

D

f WepaWe6

04f2j f1C0P:4j

Prepared

Date Cdlle/ te6: 04v15v18 11:30

Result OualiHeW

0z38 J

2z0 A

ND

378

12

0z71 J

ND

45

ND

6

80

108

94

78

69

78

77

129

125

111

105

Qualifier

%Recovery

I nieSt: h & aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

Client Sample ID: r 288MB Date Cdlle/ te6: 04v15v18 11:30 Date Re/ eihe6: 04v22v18 11:1r

feWaludWaltetWal6e/andi/a/i6

/ erknuoro-S-octaSdecaSoic acid

f eWludWlPeoane SulHinate

f eWuludWul-1-PeptanesulHulnate

/ erknuorodecaSe sunkoSate (/ gDh)

f eWludWld/ tane SulHinate Ff B9 S.

/ erknuorooctaSe hunkoSamide (gOhA)

feWaludWal-n-Peoa6e/andi/a/i6

f eWww.udWabutane SulHanate FF BAS.

) nal(te

FFBTe).

If By oD).

(/ qODA)

If By oS.

If By pS.

Isotope Dilution

13C8 FOSA

13C4 PFBA

13C2 PFHxA

13C4 PFOA

13C5 PFNA

13C2 PFDA

13C2 PFUnA

13C2 PEDoA

1802 PFHxS

13C4 PFOS

13C4-PFHpA

13C5 PFPeA

TestAmerica Job ID: 320-174C3-1 hD5:31-1-11P3j-004

Lab Sample ID: 320-17483-12 x atMb: c ateW

Lab Sample ID: 320-17483-13

x atMo: c ateW

x etPd6: c S-LC-002r - f eWiludWhate6 y (6Wil/aWidns FCdntinue6. x DL Qnit RI D f WepaWe6) nal(Ue6 Dil Ba/ 117 S8f6 0L17 04f2j f1C0P:4j 0j f10f1C0P:40 1 6 1L7 0L11 S8f6 04f2j f1C0P:4j 0j f10f1C0P:40 1 117 0LC2 S8f6 04f2j f1C0P:4j 0j f10f1C0P:40 1 1L7 0174 S8f6 04f2j f1C0P:4j 0j f10f1C0P:40 1 1L7 0170 S8f6 04f2j f1C0P:4j 0j f10f1C0P:40 1 04f2j f1C0P:4j 117 0LQ S8f6 0j f10f1C0P:40 1 117 S8f6 04f2j f1C0P:4j 0j f10f1C0P:40 111 1 1L7 112 S8f6 04f2j f1C0P:4j 0j f10f1C0P:40 1 117 0li 9 S8f6 04f2j f1C0P:4j 0j f10f1C0P:40 1 Limits Prepared Analyzed Dil Fac 25 - 150 04/25/16 07:45 05/10/16 07:40 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1 04/25/16 07:45 05/10/16 07:40 25 - 150 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1 04/25/16 07:45 05/10/16 07:40 25 - 150 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1 25 - 150 04/25/16 07:45 05/10/16 07:40 1

Client Sample ID: 12M 23 Date Cdlle/ te6: 04v15v18 13:27 Date Re/ eihe6: 04v22v18 11:1r

x etPd6: c S-LC-002r - f eWww.udWhate6 y (6Ww/aWw/dns Result OualiHeW RL) nal(te x DL Qnit D f WepaWe6) nal(Ue6 Dil Ba/ feWaludWalbutandi/a/i6FfBA). 117 0142 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 rzi A 117 0190 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 1 feWaludWalpentandi/a/i6FfBfe). 12 1L7 0LP1 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 feWaludWalPeoandi/a/i6FfByo). 14 1 1L7 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 feWaludWalPeptandi/a/i6FfByp). 472 0LP3 1 feWaludWold/tandi/a/i6FfB9). 8**z**8 1L7 0LC7 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 1 feWaludWalndnandi/a/i6FfBN). 172 .1 117 0Li 9 S8f6 04f2j f1C0P:4j 0i f10f1C07:01 1 / erknuorodecaSoic acid (/ gDA) ND 1L7 0140 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 1 f eVMudVdun6e/ andi/ a/ i6 1L7 0LC7 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 OzMI J 1 FF BQn). / erknuorododecaSoic acid (/ gDoA) ND 117 04 3 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 1 / erknuorotridecaSoic Acid (/ gTriA) ND 117 040 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 1 1L7 0L17 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 feWaludWaltetWal6e/andi/a/i6 1z4 J 1 FFBTe) f eWwludWul-n-Peoa6e/ andi/ a/ i6 1z3 JA 117 0L11 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 1 If By oD). ND 117 0IC1 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 / erknuoro-S-octaSdecaSoic acid 1 (/ aODA) 1L7 0L73 S8f6 04f2j f1C0P:4j 0j f10f1C07:01 M/5 1 f eWww.udWebutane SulHelnate FF BAS.

TestAmerica hacrameSto

I nieSt: h & aSSoS WG insoS / royectfhite: I itF okgairbaS. s gire TraiSiS8 Area

Client Sample ID: 12M 23 Date Cdlle/ te6: 04v15v18 13:27 Date Re/ eihe6: 04v2v18 11:1r

TestAmerica Job ID: 320-174C3-1 hD5: 31-1-11P3j -004

Lab Sample ID: 320-17483-13 x atWb: c ateW

) nal(te	Result	OualiHeW	RL	x DL	Qnit	D	fWepaWe6) nal(Ue6	Dil Ba/
f eWww.udWww.eoane SulHunate	37		117	0LP9	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
Ff By oS.									
feWeludWel-1-PeptanesulHelnate	1 z r	J	1L7	0LCj	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
Ff By pS.									
/erknuorodecaSesunkoSate(/gDh)	ND		117	1Ľ1	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
f eWaludWald/ tane SulHalnate Ff B9 S.	rr		117	112	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
/erknuorooctaSehunkoSamide(gOhA)	ND		117	0lj 7	S8f6		04f2j f1C0P:4j	0j f10f1C07:01	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	4	*	25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C4 PFBA	68		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C2 PFHxA	105		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C4 PFOA	107		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C5 PFNA	84		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C2 PFDA	73		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C2 PFUnA	70		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C2 PFDoA	71		25 - 150				04/25/16 07:45	05/10/16 08:01	1
18O2 PFHxS	128		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C4 PFOS	125		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C4-PFHpA	109		25 - 150				04/25/16 07:45	05/10/16 08:01	1
13C5 PFPeA	95		25 - 150				04/25/16 07·45	05/10/16 08:01	1

Client: Shannon & Wilson j ro/ectySite: Citf oFkairbangs kire Trainin* Area TestAmerica Job ID: 320-17483-1 SDG: 31-1-1153P-004

Prep Type: Total/NA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water

320-17483-13

LCS 320-105P52y2-A

LCSD 320-105P52y8-A

Surrogate Legend 13C7 kOSA = 13C7 kOSA 13C4 j kBA = 13C4 j kBA 13C2 j kHxA = 13C2 j kHxA 13C4 j kOA = 13C4 j kOA 13C4 j kOA = 13C4 j kOA 13C2 j kDA = 13C2 j kDA 13C2 j kUA = 13C2 j kUAA 13C2 j kDoA = 13C2 j kDA 13C2 j kHxS = 17C2 j kHxS 13C4 j kOS = 13C4 j kOS

MB 320-105P52y1-A

125P23

Lab Control Sample

Method Blang

Lab Control Sample Dup

			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		3C8 FOS/	3C4 PFB/	3C2 PFHx	3C4 PFO/	3C5 PFN/	3C2 PFD/	3C2 PFUn	3C2 PFDc
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
320-17483-1	1855P4	8 6	81	97	100	79	57	73	79
320-17483-2	1857P4	4 6	8P	97	94	53	82	89	53
320-17483-3	9P443	76	55	114	105	101	90	79	75
320-17483-4	411788	76	53	110	122	98	78	58	50
320-17483-P	4P4954	36	70	121	95	7P	98	11P	109
320-17483-8	125311	4 6	85	97	91	87	P1	P4	P9
320-17483-5	125230	26	81	93	74	88	P5	P5	P8
320-17483-7	P24P8P	86	73	102	98	7P	99	118	114
320-17483-9	4P251P7	76	58	9P	79	50	84	89	8P
320-17483-9	4P251P7	56	72	119	101	73	72	77	70
320-17483-10	125124	P2	89	102	119	118	105	120	104
320-17483-11	P28P58	P6	54	97	9P	83	8P	59	79
320-17483-12	P28858	86	70	107	94	57	89	57	55
320-17483-13	125P23	4 6	87	10P	105	74	53	50	51
LCS 320-105P52y2-A	Lab Control Sample	85	10P	104	10P	105	109	119	110
LCSD 320-105P52y8-A	Lab Control Sample Dup	52	119	11P	109	112	117	124	115
MB 320-105P52y1-A	Method Blang	94	135	145	147	1P3 6	1P5 6	1PP 6	143
			Perce	ent Isotone	Dilution Re	covery (Ac	centance I	imits)	
		BO2 PEHx		3C4-PFHp					
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)				
320-17483-1	1855P4		125	110	79				
320-17483-2	1857P4	115	125	110	98				
320-17483-3	9P443	115	144	119	119				
320-17483-4	411788	124	140	124	11P				
320-17483-P	4P4954	112	138	122	123				
320-17483-8	125311	124	121	101	92				
320-17483-5	125230	115	124	101	75				
320-17483-7	P24P8P	131	132	100	102				
320-17483-9	4P251P7	122	120	99	101				
320-17483-9	4P251P7	124	1PP 6	120	120				
320-17483-10	125124	128	137	121	94				
320-17483-11	P28P58	120	118	105	99				
320-17483-12	P28858	129	12P	111	10P				

127

10P

113

139

12P

108

113

1P1 6

109

109

117

1P4 6

9P

107

118

14P

Isotope Dilution Summary

Client: Shannon & Wilson j ro/ectySite: Citf oFkairbangs kire Trainin* Area TestAmerica Job ID: 320-17483-1 SDG: 31-1-1153P-004

13C4-j kHpA = 13C4-j kHpA 13CPj kj eA = 13CPj kj eA

TestAmerica Sacramento

Client Sample ID: Method Blank

Prep Type: Total/NA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-107572/1-A
Matrix: Water

Analysis Batch: 109605								Prep Batch:	
Analysis Batom recover	MB	MB						Top Batom	
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
/ erkn(orob(taSoic aciB)/g. A8	0LP37	J	210	0L4C	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(oroxeStaSoic aciB)/ g/ eA8	рD		210	0199	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/erkn(oro&eHaSoicaciB)/g6HA8	рD		210	0LP9	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(oro&extaSoic aciB)/ g6xA8	рD		210	0170	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(orooctaSoic aciB)/ gOA8	рD		210	0LPj	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/erkn(oroSoSaSoicaciB)/gpA8	рD		210	0LCj	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(oroBecaSoic aciB)/ gDA8	рD		210	0144	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(oro(SBecaSoic aciB)/gUSA8	рD		210	0LPj	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(oroBoBecaSoic aciB)/ gDoA8	рD		210	0Ц 7	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(orotriBecaSoic AciB)/gTriA8	рD		210	ОЦ ј	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(orotetraBecaSoic aciB)/ gTeA8	рD		210	0120	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(oro-S-&eHaBecaSoic aciB)/ g6HDA8	0l72j	J	210	0L12	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/ erkn(oro-S-octaSBecaSoic aciB)/ gODA8	рD		210	0LCP	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/erkn(orob(taSeh(nkoSate)/g.h8	рD		210	0192	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/enkn(oro&eHaSeh(nkoSate)/g6Hh8	рD		210	0L7P	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/enkn(oro-1-&extaSes(nkoSate)/g6xh8	рD		210	0LP1	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/enkn(oroBecaSes(nkoSate)/gDh8	рD		210	112	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/erkn(orooctaSeh(nkoSate)/gOh8	рD		210	1L3	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
/erkn(orooctaSeh(nkoSamiBe)gOhA8	рD		210	0LC4	SdfN		04f2j f1C0P:4j	0j f11f1C23:j 7	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	6*		25 - 150				0*42541/ 0:7*5	0541141/ 23758	1
13C* PFBA	13:		25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C2 PFHxA	1*:		25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C* PFOA	1*8		25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C5 PFNA	153	9	25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C2 PFDA	15:	9	25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C2 PFUnA	155	9	25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C2 PFDoA	1*3		25 - 150				0*42541/ 0:7*5	0541141/23758	1
1802 PFHxS	136		25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C* PFOS	151	9	25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C*-PFHpA	15*	9	25 - 150				0*42541/ 0:7*5	0541141/23758	1
13C5 PFPeA	1*5		25 - 150				0*42541/ 0:7*5	0541141/23758	1

Lab Sample ID: LCS 320-107572/2-A Matrix: Water Analysis Batch: 109370

Analysis Batch: 109370	Spike	LCS	1.09				Prep Batch: 107572 %Rec.
Analyte	Added		Qualifier	Unit	D	%Rec	Limits
/ erkt(orob(taSoic aciB)/ g. A8	4010	4319		SdfN		110	P4 - 137
/ erkn(oroxeStaSoic aciB)/ g/ eA8	4010	4j LO		SdfN		112	C9 - 134
/ erkn(oro&eHaSoic aciB)/ g6HA8	4010	4ac		SdfN		11C	P0 - 13C
/ erkn(oro&extaSoic aciB)/g6xA8	4010	43L0		SdfN		10P	C3 - 13j
/ erkn(orooctaSoic aciB)/ gOA8	4010	4j LO		SdfN		112	C3 - 141
/ erkn(oroSoSaSoic aciB)/ gpA8	4010	44L1		SdfN		110	P1 - 140
/ erkn(oroBecaSoic aciB)/ gDA8	4010	44L0		SdfN		110	CC- 141

TestAmerica hacrameSto

Prep Type: Total/NA

Client Sample ID: Lab Control Sample

I nieSt: h & aSSoS WG insoS / royectfh ite: I itF okgairbaSus gire TraiSiSd Area

8

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

	Client Sample ID: Lab Control S Prep Type: To				
				Prep Batch: 107572	
Spike	LCS LCS			%Rec.	
Added	Result Qualifier	Unit	D %Rec	Limits	
4010	42LP	SdfN	10P	C7 - 139	
4010	4j l7	SdfN	11j	P1 - 139	
4010	j 4LC	SdfN	13P	j 1 ₋ 139	
4010	401	SdfN	11j	4P-130	
4010	4j L7	SdfN	114	j 0 ₋ 1j 0	
4010	37Ц	SdfN	9C	j 0 ₋ 1j 0	
3j L4	4417	SdfN	12P	jj_14P	
		0.0	(
3PL7	4114	SdfN	109	j 7 - 137	
		0.00			
3711	41L1	SdfN	107	32 - 1P0	
0710	: 414	0.101	400		
37LC	j 1L1	SatiN	133	3j - 1j P	
0710	404	CaleN	101	40.400	
3712	404	SOUN	121	4P-1C2	
4010		0.101	400	:0.400	
4010]]4	Satin	139	j 9 - 1C3	
	Added 40L0 40L0	Added Result Qualifier 4010 421P 4010 4117 4010 4117 4010 4011 4010 4011 4011 4011 4010 4011 4011 4011 4010 4117 3711 3114 3711 4114 3712 4114 3712 4014 4014 4014	Spike AddedLCS ResultLCS QualifierUnit SdfN40I042IPSdfN40I04j I7SdfN40I0j 4ICSdfN40I0j 4ICSdfN40I04C1SdfN40I04j I7SdfN40I04j I7SdfN40I037IjSdfN3j I444I7SdfN3FI741I4SdfN37I2j 11SdfN37I24CI4SdfN	Spike Added LCS Result LCS Qualifier Unit D %Rec 4010 421P SdfN 10P 4010 4j I7 SdfN 11j 4010 4j I7 SdfN 11j 4010 j 41C SdfN 13P 4010 j 41C SdfN 13P 4010 4C1 SdfN 11j 4010 4C1 SdfN 11j 4010 4J I7 SdfN 114 4010 37Lj SdfN 12P 3j 14 4417 SdfN 12P 3FL7 4114 SdfN 109 37L1 41L1 SdfN 133 37L2 j 1L1 SdfN 133 37L2 4C4 SdfN 121	

	LCS	LCS	
Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	/:		25 - 150
13C* PFBA	105		25 - 150
13C2 PFHxA	10*		25 - 150
13C* PFOA	105		25 - 150
13C5 PFNA	10:		25 - 150
13C2 PFDA	106		25 - 150
13C2 PFUnA	116		25 - 150
13C2 PFDoA	110		25 - 150
1802 PFHxS	105		25 - 150
13C* PFOS	10/		25 - 150
13C*-PFHpA	106		25 - 150
13C5 PFPeA	108		25 - 150

Lab Sample ID: LCSD 320-107572/3-A Matrix: Water Analysis Batch: 109370

Analysis Batch: 109370							Prep Ba	tch: 10)7572
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
/ erkn(orob(taSoic aciB)/g. A8	4010	4014		SdfN		101	P4 - 137	7	30
/ erkn(oroxeStaSoic aciB)/g/eA8	4010	4212		SdfN		10C	C9 - 134	С	30
/ erkn(oro&eHaSoic aciB)/ g6HA8	4010	4313		SdfN		107	P0 - 13C	Р	30
/ erkn(oro&extaSoic aciB)/g6xA8	4010	3714		SdfN		9C	C3 _ 13j	11	30
/ erkn(orooctaSoic aciB)/ gOA8	4010	43IP		SdfN		109	C3 ₋ 141	3	30
/ erkn(oroSoSaSoic aciB)/ gpA8	4010	42LP		SdfN		10P	P1 ₋ 140	3	30
/ erkn(oroBecaSoic aciB)/ gDA8	4010	4317		SdfN		109	CC-141	1	30

TestAmerica hacrameSto

Prep Type: Total/NA

Client Sample ID: Lab Control Sample Dup

I nieSt: h &aSSoS WG insoS / royectfhite: I itF okgairbaSus gire TraiSiSd Area TestAmerica Job ID: 320-174C3-1 hD5: 31-1-11P3j -004

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Matrix: Water Analysis Batch: 109370							Prep Typ Prep Ba	-	07572	
	Spike		LCSD				%Rec.		RPD	
Analyte	Added		Qualifier		D	%Rec	Limits	RPD	Limit	
erkn(oro(SBecaSoic aciB	4010	3712		SdfN		9C	C7 - 139	11	30	
/ gUSA8										1
/ erkn(oroBoBecaSoic aciB	4010	3717		SdfN		9P	P1 ₋ 139	1P	30	
)/ gDoA8										
/ erkn(orotriBecaSoic AciB	4010	4Cl2		SdfN		11j	j 1 ₋ 139	1P	30	
)/ gTriA8	4010	0714		0.101			15 400	47	00	
/ erkn(orotetraBecaSoic aciB	4010	3714		SdfN		9C	4P-130	17	30	
)/ gTeA8	4010	3PL1		SdfN		93	:0 1:0	21	30	
/ erkn(oro-S-&eHaBecaSoic aciB	4000	Эгц		Suin		93	j 0 ₋ 1j 0	21	30	
)/ g6HDA8 / orl// org S octoSPoccoScio ociP	4010	3711		SdfN		9j	j 0 ₋ 1j 0	1	30	
/ erkn(oro-S-octaSBecaSoic aciB)/ gODA8	-000	01		Jun		J]0-1]0		50	
/erknjorob(taSeh(nkoSate	3j L4	41LC		SdfN		117	jj_14P	Р	30	
)/ g. h8				oun .))			
/enkn(oro&eHaSeh(nkoSate	3PL7	41L3		SdfN		109	j 7 - 137	0	30	
)/ g6Hh8							,			
/ erkn(oro-1-&extaSes(nkoSate	37L1	4119		SdfN		110	32 - 1P0	2	30	1
)/ g6xh8										
/ erkn(oroBecaSe s(nkoSate	37LC	4913		SdfN		127	3j - 1j P	4	30	
)/ gDh8										
/erkn(orooctaSeh(nkoSate	3712	4119		SdfN		110	4P_1C2	10	30	
)/ gOh8										
/ erkn(orooctaSeh(nkoSamiBe	4010	4914		SdfN		124	j 9 - 1C3	12	30	

,3	LCSD	LCSD	
Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	: 2		25 - 150
13C* PFBA	116		25 - 150
13C2 PFHxA	115		25 - 150
13C* PFOA	106		25 - 150
13C5 PFNA	112		25 - 150
13C2 PFDA	118		25 - 150
13C2 PFUnA	12*		25 - 150
13C2 PFDoA	11:		25 - 150
18O2 PFHxS	113		25 - 150
13C* PFOS	113		25 - 150
13C*-PFHpA	118		25 - 150
13C5 PFPeA	11/		25 - 150

QC Association Summary

I nieSt: h & aSSoS WG insoS

/ royectfhite: I itF okgairbaS8s gire TraiSiSN Area

TestAmerica Job ID: 320-174C3-1 hD5:31-1-11P3j-004

LCMS

Prep Batch: 107572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-174C3-1	1CPPj 4	Totarf9 A	Gater	3j 3j	
320-174C3-2	1CP7j 4	Totanf9 A	Gater	3j 3j	
320-174C3-3	6j 443	Totanf9 A	Gater	3j 3j	
320-174C3-4	4117CC	Totanf9 A	Gater	3j 3j	
320-174C3-j	4j 46P4	Totanf9 A	Gater	3j 3j	
320-174C3-C	12P311	Totanf9 A	Gater	3j 3j	
320-174C3-P	12P230	Totanf9 A	Gater	3j 3j	
320-174C3-7	j 24j Q	Totanf9 A	Gater	3j 3j	
320-174C3-6	4j 2P1j 7	Totarf9A	Gater	3j 3j	
320-174C3-10	12P124	Totarf9 A	Gater	3j 3j	
20-174C3-11	j 2Q PC	Totarf9 A	Gater	3j 3j	
20-174C3-12	j 200PC	Totarf9 A	Gater	3j 3j	
20-174C3-13	12Pj 23	Totarf9 A	Gater	3j 3j	
.l h 320-10Pj P2f2-A	Lab I oStronh ampre	Totarf9 A	Gater	3j 3j	
.l hD 320-10Pj P2f3-A	Lab I oStronh ampre Dup	Totarf9 A	Gater	3j 3j	
MB 320-10Pj P2f1-A	Met&od BnaS8	Totarí9 A	Gater	3j 3j	
nalysis Batch: 1093	370				
ab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batc
20-174C3-1	1CPPj 4	Totarf9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-2	1CP7j 4	Totarf9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-C	12P311	Totarf9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-P	12P230	Totarf9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-7	j 24j Q	Totarf9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-6	4j 2P1j 7	Totarf9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-10	12P124	Totarf9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-11	j 2Q PC	Totarf9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-12	j 200PC	Totar í 9 A	Gater	Gh-Ll -002j	10Pj P
320-174C3-13	12Pj 23	Totar í 9 A	Gater	Gh-Ll -002j	10Pj P
.l h 320-10Pj P2f2-A	Lab I oStronhampne	Totar í 9 A	Gater	Gh-Ll -002j	10Pj P

Analysis Batch: 109605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-174C3-3	6j 443	Totarf9 A	Gater	Gh-Ll -002j	10Pj P2
320-174C3-4	41170C	Totani9 A	Gater	Gh-Ll -002j	10Pj P2
320-174C3-j	4j 46P4	Totani9 A	Gater	Gh-Ll -002j	10Pj P2
320-174C3-6	4j 2P1j 7	Totaní9 A	Gater	Gh-Ll -002j	10Pj P2
MB 320-10Pj P2f1-A	Met&od BnaS8	Totar í 9 A	Gater	Gh-Ll -002j	10Pj P2

Lab Chronicle

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17483-1 SDG: 31-1-1153p-004

Lab Sample ID: 0-4N8x270N8

Lab Sample ID: 0-4M8x270M

Lab Sample ID: 0-4N8x270N0

Watrid: / ater

Watrid: / ater

Watrid: / ater

Watrid: / ater

Client Sample ID: 871132 Date Collecte6: 428x87 4v:-x Date 5 eceiTe6: 42R - 87 88:83

	Patch	Patch		Dil	Initial	Ninal	Patch	Arepare6		
Arep yBpe	yBpe	Wetho6	5zn	Nactor	smoznt	s moz nt	9 z mber	or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	ЗрЗр			p87N3 mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p87N3 mL	1 10 0 mL	10.350	0p/10/18 02:21	JRB	TAL SAC

Client Sample ID: 871x32 Date Collecte6: 42RxR7 4v:0-Date 5 eceiTe6: 42R - 87 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial s moz nt	Ninal s moz nt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3р3р			p48N mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p48N mL	1 10 0 mL	10.350	0p/10/18 02:42	JRB	TAL SAC

Client Sample ID: v3220 Date Collecte6: 428x87 84:22

Date 5 eceiTe6: 42R - 187 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial s moz nt	Ninal s moz nt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	ЗрЗр			p34 mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p34 mL	1 10 0 mL	10. 80p	0p/12/18 20:12	JRB	TAL SAC

Client Sample ID: 288x77 Date Collecte6: 428x87 88:32 Date 5 eceiTe6: 42R - R7 88:83

Arep y Bpe	Patch vBpe	Patch Wetho6	5zn	Dil Nactor	Initial s moz nt	Ninal s moz nt	Patch 9 z mber	Arepare6 or s nalBFe6	snalBut	Lab
Total/9 A	PreH	3p3p	5211	Nactor	p8. N5 mL	1100 mL	105p52	04/2p/18 05:4p		TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p8. № mL	1 10 0 mL	10. 80p	0p/12/18 20:33	JRB	TAL SAC

Client Sample ID: 232v12 Date Collecte6: 428x87 80:00 Date 5 eceiTe6: 42R - 187 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial s moz nt	Ninal s moz nt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	ЗрЗр			p43 mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p43 mL	1 10 0 mL	10. 80p	0p/12/18 20:p4	JRB	TAL SAC

Client Sample ID: 8-1088 Date Collecte6: 42RsxR7 83:41 Date 5 eceiTe6: 42R - 187 88:83

Arep yBpe	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial s moz nt	Ninal s moz nt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3р3р			p15N mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p15N mL	1 10 0 mL	10. 350	0p/10/18 0p:32	JRB	TAL SAC

TestAmerica Sacramento

13

Lab Sample ID: 0-4N8x270N2

Lab Sample ID: 0-4N8x270N8 Watrid: / ater

Lab Sample ID: 0-4N8x270N

Watrid: / ater

Lab Chronicle

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17483-1 SDG: 31-1-1153p-004

Lab Sample ID: 0-4M8x270M

Lab Sample ID: 0-4N8x270Nt

Lab Sample ID: 0-4N8x270Nr

Watrid: / ater

Watrid: / ater

Watrid: / ater

Client Sample ID: 8-1-04 Date Collecte6: 42Rsr87 87:01

Date 5 eceiTe6: 42R - **B**7 88:83

	Patch	Patch		Dil	Initial	Ninal	Patch	Arepare6		
Arep yBpe	уВре	Wetho6	5zn	Nactor	smoznt	s moz nt	9 z mber	or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	ЗрЗр			p4212 mL	1 № 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p42122 mL	1 10 0 mL	10.350	0p/10/18 0p:p3	JRB	TAL SAC

Client Sample ID: 3-2373 Date Collecte6: 42RsxR7 81:-3 Date 5 eceiTe6: 42R - R7 88:83

	Patch	Patch		Dil	Initial	Ninal	Patch	Arepare6		
Arep yBpe	yBpe	Wetho6	5zn	Nactor	s moz nt	s moz nt	9 z mber	or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	ЗрЗр			p24N7 mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p24N7 mL	1 10 0 mL	10. 350	0p/10/18 08:1p	JRB	TAL SAC

Client Sample ID: 23-183x Date Collecte6: 428v87 4v:03 Date 5 eceiTe6: 42R - 87 88:83

	Patch	Patch		Dil	Initial	Ninal	Patch	Arepare6		
Arep yBpe	yBpe	Wetho6	5zn	Nactor	smoznt	s moz nt	9 z mber	or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3р3р			pp2N mL	1 10 0 mL	105p52	04/2p/18 05:4p	6JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	pp2N mL	1 10 0 mL	10.350	0p/10/18 08:38	JRB	TAL SAC
Total/9 A	PreH	ЗрЗр			pp2N mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	pp2N mL	1 10 0 mL	10. 80p	0p/12/18 21:1p	JRB	TAL SAC

Client Sample ID: 8-18-2 Date Collecte6: 42Rvr87 84:08 Date 5 eceiTe6: 42R - 187 88:83

Lab Sample ID: 0-418x270184 Watrid: / ater

Lab Sample ID: 0-418x270188

Lab Sample ID: 0-4M8x270M8-

Агер уВре	Patch yBpe	Patch Wetho6	5zn	Dil Nactor	Initial s moz nt	Ninal s moz nt	Patch 9 z mber	Arepare6 or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	3р3р			p3. N7 mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p3. N7 mL	1 10 0 mL	10. 350	0p/10/18 08:p5	JRB	TAL SAC

Client Sample ID: 3-7317 Date Collecte6: 428v87 88:-7 Date 5 eceiTe6: 42R - 187 88:83

	Patch	Patch		Dil	Initial	Ninal	Patch	Arepare6		
Arep yBpe	yBpe	Wetho6	5zn	Nactor	smoznt	s moz nt	9 z mber	or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	ЗрЗр			p47N mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	p47N mL	1 10 0 mL	10.350	0p/10/18 05:1.	JRB	TAL SAC

Client Sample ID: 3-7717 Date Collecte6: 428v87 88:04 Date 5 eceiTe6: 42R - 87 88:83

		Patch	Patch		Dil	Initial	Ninal	Patch	Arepare6		
Ar	еруВре	yBpe	Wetho6	5zn	Nactor	smoznt	s moz nt	9 z mber	or s nalBFe6	s nalBut	Lab
Тс	otal/9 A	PreH	ЗрЗр		_	p44 N mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC

TestAmerica Sacramento

Watrid: / ater

Watrid: / ater

Lab Chronicle

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-17483-1 SDG: 31-1-1153p-004

Watrid: / ater

Lab Sample ID: 0-418x27018-

Client Sample ID: 3-7717 Date Collecte6: 4278v787 88:04

Date 5 eceiTe6: 42R - **R**87 88:83

	Patch	Patch		Dil	Initial	Ninal	Patch	Arepare6		
Arep yBpe	уВре	Wetho6	5zn	Nactor	s moz nt	s moz nt	9 z mber	or s nalBFe6	s nalBut	Lab
Total/9 A	Analysis	WS-LC-002p		1	p44N4 mL	1 10 0 mL	10.350	0p/10/18 05:40	JRB	TAL SAC

Client Sample ID: 8-13-0 Date Collecte6: 42RvR7 80:- x Date 5 eceiTe6: 42R - 187 88:83

Lab Sample ID: 0-418x270180 Watrid: / ater

	Patch	Patch		Dil	Initial	Ninal	Patch	Arepare6		
Arep yBpe	уВре	Wetho6	5zn	Nactor	smoznt	s moz nt	9 z mber	or s nalBFe6	s nalBut	Lab
Total/9 A	PreH	ЗрЗр			pp1N7 mL	1 10 0 mL	105p52	04/2p/18 05:4p	6 JA	TAL SAC
Total/9 A	Analysis	WS-LC-002p		1	pp1N7 mL	1 10 0 mL	10.350	0p/10/18 07:01	JRB	TAL SAC

LaboratorB 5 eferenceu:

TAL SAC = TestAmerica Sacramento, 770 Riverside Parkway, West Sacramento, CA . p80p, TEL (. 18)353-p800

Certification Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-18463-1 SDG: 31-1-11735-004

Laboratory: TestAmerica Sacramento

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

Authority	Program	EPA Region	Certification ID	Expiration Date	
A2LA	DoD ELAP		2928-01	01-31-17	
Alaska (UST)	State Program	10	UST-055	12-18-16	
Arizona	State Program	9	AZ0708	08-11-16	
Arkansas DEQ	State Program	6	88-0691	06-17-17	
California	State Program	9	2897	01-31-17	
Colorado	State Program	8	CA00044	08-31-16	
Connecticut	State Program	1	PH-0691	06-30-17	
Florida	NELAP	4	E87570	06-30-16	
Hawaii	State Program	9	N/A	01-31-17	
Illinois	NELAP	5	200060	03-17-17	
Kansas	NELAP	7	E-10375	07-31-16	
Louisiana	NELAP	6	30612	06-30-16	
Maine	State Program	1	CA0004	04-18-18	
Michigan	State Program	5	9947	01-31-18	
Nevada	State Program	9	CA00044	07-31-16	
New Jersey	NELAP	2	CA005	06-30-16	
New York	NELAP	2	11666	04-01-17	
Oregon	NELAP	10	4040	01-29-17	
Pennsylvania	NELAP	3	68-01272	03-31-17	
Texas	NELAP	6	T104704399	05-31-16	
US Fish & Wildlife	Federal		LE148388-0	10-31-16	
USDA	Federal		P330-11-00436	12-30-17	
USEPA UCMR	Federal	1	CA00044	11-06-16	
Utah	NELAP	8	CA00044	02-28-17	
Virginia	NELAP	3	460278	03-14-17	
Washington	State Program	10	C581	05-05-17	
West Virginia (DW)	State Program	3	9930C	12-31-16	
Wyoming	State Program	8	8TMS-L	01-29-17	

Method Summary

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TestAmerica Job ID: 320-174C3-1 h D5 : 31-1-11P3j -004 1

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Protocol Re	erences:		
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Laboratory	References:		
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TestAmerica hacrameSto

Sample Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-18463-1 SDG: 31-1-11735-004

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-18463-1	167754	Water	04/18/16 09:28	04/22/16 11:15
320-18463-2	167854	Water	04/18/16 09:32	04/22/16 11:15
320-18463-3	95443	Water	04/18/16 10:44	04/22/16 11:15
320-18463-4	411866	Water	04/18/16 11:54	04/22/16 11:15
320-18463-5	454974	Water	04/18/16 13:33	04/22/16 11:15
320-18463-6	127311	Water	04/18/16 15:07	04/22/16 11:15
320-18463-7	127230	Water	04/18/16 16:37	04/22/16 11:15
320-18463-8	524565	Water	04/18/16 17:25	04/22/16 11:15
320-18463-9	4527158	Water	04/19/16 09:35	04/22/16 11:15
320-18463-10	127124	Water	04/19/16 10:31	04/22/16 11:15
320-18463-11	526576	Water	04/19/16 11:26	04/22/16 11:15
320-18463-12	526676	Water	04/19/16 11:30	04/22/16 11:15
320-18463-13	127523	Water	04/19/16 13:28	04/22/16 11:15

TestAmerica Sacramento

	ive 2705 Saint Andrews Lo		DY RECOR	Lab Attn	oratory Test	Page of 2
0 N 34th Street, Suite 100 2043 Westport Center Dr attle, WA 98103 St Louis, MO 63146-356 06) 632-8020 (314) 699-9660	4 Pasco, WA 99301-337 (509) 946-6309	8		ers/Sample Container		
55 Hill Road 5430 Fairbanks Street, Si irbanks, AK 99709 Anchorage, AK 99518 V7) 479-0609 (907) 561-2120	uite 3	\square		de preservative if used)	77	7
55 S.W. Canyon Road 1321 Bannock Street, Sui rtland, OR 97201-2498 Denver, CO 80204 (3) 223-6147 (303) 825-3800	Date	ad CSR CR	5///	///	100 COTOFE	
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167854				+	2	
411866	1044		<u> </u>		2	
)154					
454974	1333				2	
127311	1507				2	
127230	1637				2	
524565	1725				2	
4527158	0935 4/19				2	
127124	1031 1				2 \$	
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equested Turnaround Time.			Signature:	Time:	Signature	Time
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5/18/2016

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(206) 632-8020 (314) 699-9660 (314) 699-9660 5430 Fairbanks Street, Suite 3 Aarbanks, AK 99'09 (907) 479-0600 (907) 479-0600 (907) 561-2120 3255 514 Canyon Road 1321 Bannock Street, Suite 200 Portland, OR 97201-2498 (303) 825-3800 (503) 223-6147 Lab No	(509) 946-6309 Date Time Sampled		Analysis Parameters/Sampl (include preserv:		77
526576	1126 4/19/11			2	Water
526676	1130 1	XX		2	
127523	1328 \$	XX		2	
Project Information Samp	le Receipt	Relinquished By			Relinquished By: -3
Project Number. 31-1-11735-001 Total Number of		Signature. Time (Signature. 1	Fime'Sign	ature Time
Project Name CF RFTC COC Seals/Inte Contact. MDN JAK Received Good	d Cond./Cold	Printed Name Date.		Date Print	ed Name Date
Ongoing Project? Yes X No Delivery Metho Sampler MON (attach shipping		Company Shannon & L	Company'	Com	ipany
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F-19-91/UR

5/18/2016

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Client: Shannon & Wilson

Login Number: 18463 List Number: 1 Creator: Nelson, Kym D

Question	Answer	Comment
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SamAle vustocwsealsf ipAresentf are intavt,	N=O	
Rhe vooler or samAles co not aAAear to haye been vomAromisec or tamAerec ' ith,	Rrue	
SamAles ' ere reveiyec on ive,	Rrue	
Cooler RemAerature is avveAtable,	Rrue	
Cooler RemAerature is revorcec,	Rrue	
CI C is Aresent,	Rrue	
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CI C is pillec out ' ith all Aertinent inpormation,	Rrue	
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Job Number: 320-17483-1 SDG Number: 31-1-1153T-004

List Source: TestAmerica Sacramento

Laboratory Data Review Checklist

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Completed by: Adam Wyborny
Title:Environmental Engineering StaffDate:May 16, 2016
CS Report Name: City of Fairbanks Fire Training Area Report Date: May 16, 2016
Consultant Firm: Shannon & Wilson, Inc.
Laboratory Name: TestAmerica, Inc. Laboratory Report Number: 320-18463
ADEC File Number: 102.38.182 ADEC RecKey Number:
1. Laboratory a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? □Yes □ No ⊠NA (Please explain.) Comments:
The ADEC has not approved any analytical laboratory for perfluorinated compound (PFC) analysis.
 b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved? ☐Yes ☐ No ☑NA (Please explain.)
Analyses were performed by TestAmerica, Inc. in Folsom, California.
 2. <u>Chain of Custody (COC)</u> a. COC information completed, signed, and dated (including released/received by)? ∑Yes □ No □NA (Please explain.) Comments:
b. Correct analyses requested? Xes No NA (Please explain.) Comments:
 3. <u>Laboratory Sample Receipt Documentation</u> a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)? ∑Yes □ No □NA (Please explain.) Comments:
The temperature blank or cooler was measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the laboratory, as specified in the EPA publication SW-846. This range has been approved by ADEC.

1	5. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
	\boxtimes Yes \square No \square NA (Please explain.)Comments:
	Analysis of PFCs does not require a preservative other than temperature control.
(Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)? Yes No NA (Please explain.) Comments:
	The sample-receipt form notes that the samples were received in good condition.
(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 XNA (Please explain.)
	There were no discrepancies reported by the laboratory.
(e. Data quality or usability affected? (Please explain.) Comments:
	The laboratory did not note any affect on data quality or usability.
-	Narrative Present and understandable?
	Yes No NA (Please explain.) Comments:

4.

b. Discrepancies, errors or QC failures identified by the lab?
 ∑Yes □ No □NA (Please explain.) Comments:

The case narrative identifies the following discrepancies and observations:

Method(s) WS-LC-0025: The continuing calibration verification (CCV) associated with batch 109605 recovered Perfluorooctane Sulfonamide (FOSA) above the upper control limit. The following samples are affected: 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5) and 4527158 (320-18463-9). The samples associated with this CCV did not contain detectable quantities of the affected analytes, so the data were unaffected.

Method(s) WS-LC-0025: The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 167754 (320-18463-1), 167854 (320-18463-2), 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5), 127311 (320-18463-6), 127230 (320-18463-7), 524565 (320-18463-8), 4527158 (320-18463-9), 526576 (320-18463-11), 526676 (320-18463-12) and 127523 (320-18463-13). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. The data are considered unaffected.

Method(s) WS-LC-0025: Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for project sample MB 320-107572/1-A. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-107572.

Method(s) 3535: The following samples were amber colored:167754 (320-18463-1), 167854 (320-18463-2), 95443 (320-18463-3), 411866 (320-18463-4), 454974 (320-18463-5), 127311 (320-18463-6), 127230 (320-18463-7), 524565 (320-18463-8), 4527158 (320-18463-9), 127124 (320-18463-10), 526576 (320-18463-11), 526676 (320-18463-12) and 127523 (320-18463-13). Samples 7 and 9 were clogged and took extra time to load into the columns.

c. Were all corrective actions documented? ☐Yes ☐ No ⊠NA (Please explain.)

Comments:

No corrective actions were required.

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

The method reporting limit and organic preparation batch comments are not considered to affect data quality or usability.

IDA-recovery failures can affect data quality, and are discussed in Section 6c.

According to the laboratory, quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. In addition, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which was achieved for all IDAs in the samples. See Section 6c for further comments.

5. Samples Results

	a. Correct analyses performed/reported as requested of	on COC?
	Yes No NA (Please explain.)	Comments:
]
	b. All applicable holding times met?	
	\boxtimes Yes \square No \square NA (Please explain.)	Comments:
		Comments.
	The hold time of seven days until extraction was met	t.
	c. All soils reported on a dry weight basis?	
	\Box Yes \Box No \boxtimes NA (Please explain.)	Comments:
	No soil samples were submitted with this work order	
	d. Are the reported PQLs less than the Cleanup Level	or the minimum required detection level for the
	project? $\square N = \square N \land (D = a = a = b = a)$	Commenter
	Yes No NA (Please explain.)	Comments:
	The PQL, equivalent to the TestAmerica Reporting I	Limit (RL), is less than the applicable EPA
	provisional drinking-water health advisory levels and	
	levels for perfluorooctane sulfonate (PFOS) and perfl	
	e. Data quality or usability affected?	
		Comments:
	The data availity on dwashility was a supeffected	
	The data quality and usability were unaffected.	
6	OC Semula	
0. <u>(</u>	<u>QC Samples</u> a. Method Blank	
	a. Method Blank i. One method blank reported per matrix, ana	lysis and 20 samplas?
	Yes No NA (Please explain.)	Comments:
	ii. All method blank results less than PQL?	
	\boxtimes Yes \boxtimes No \square NA (Please explain.)	Comments:
		Comments.
	Two PFC analytes were detected in the MB at estimate	ated concentrations less than their POLs

Two PFC analytes were detected in the MB at estimated concentrations less than their PQLs (reporting limits, or RLs). These analytes are Perfluorobutanoic acid (PFBA) and Perfluoro-n-hexadecanoic acid (PFHxDA).

Comments:

All of the project samples were associated with the MB containing detectable perfluorinated compounds.

The concentration of PFBA detected in the method blank is considered to affect all project samples except 127230 and 127124. Those samples are considered unaffected because PFBA was detected at concentrations greater than ten times the concentration detected in the method blank. The PFHxDA concentration detected in the method blank is considered to affect all project samples because PFHxDA concentrations were present in all samples at concentrations greater than the method detection limit (MDL) and within a factor of five of the MB concentrations.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined? Xes No NA (Please explain.) Comments:

The PFBA concentrations detected in project samples 167754, 167854, 411866, 127311, 526576, 526676, and 127523, are considered biased high by the method blank detection and flagged 'JH*' in the analytical results table.

The PFBA concentrations detected in project samples 95443, 454974, 524565, and 4527158, are considered not detected due to the method blank detection and flagged 'B*' at either the reported sample result or the PQL, whichever is higher.

The PFHxDA concentrations detected in all project samples are considered not detected and flagged 'B*' at either the reported sample result or the PQL, whichever is higher.

v. Data quality or usability affected? (Please explain.)

Comments:

Yes; see above.

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

Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
 ∑Yes □ No □NA (Please explain.) Comments:

LCS/LCSD sample results were reported.

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

 \Box Yes \Box No \boxtimes NA (Please explain.)

Comments:

Metals and inorganics were not analyzed as part of 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 □ No □NA (Please explain.) Comments:

Yes; percent recoveries were between 60% and 140% or 150%, depending on the analytes, as required by the laboratory method.

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 NA (Please explain.) Comments:

Yes; LCS/LCSD RPDs were less than the laboratory limit of 30%.

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

No samples were affected; percent recoveries and RPDs were within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined? Yes No NA (Please explain.) Comments:

No data flags are required; see above.

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

The data quality and usability were unaffected.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples? Xes No NA (Please explain.) Comments:

The analytical method WS-LC-0025 uses Isotope Dilution Analyte (IDA) recovery, which entails adding a 13C-isotope of each target analyte and assessing the recovery of each analyte. The isotopically labeled compounds are the surrogates for this method.

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) NA (Please explain.)

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Y es	M	INO

Comments:

The recovery of 13C4 perfluorodecane sulfonate (PFOS) was outside the method-recommended limit of 25% to 150% for project sample 4527158. However, PFOS was not detected in the associated sample so no qualification is necessary.

With the exception of 13C8 perfluorooctane sulfonamide (FOSA), the percent recoveries are within the method-recommended limit of 25% to 150% for all project samples. The percent recovery for FOSA is below the method-recommended limit for each of the project samples except 127124. However, according to the laboratory, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which was achieved for all IDAs in the samples.

The percent recoveries of 13C5 perfluorononanoic acid (PFNA), 13C2 perfluorodecanoic acid (PFDA), 13C2 perfluoroundecanoic acid (PFUnA), 13C4 perfluorodecane sulfonate (PFOS), and 13C4 perfluoroheptanoic acid (PFHpA), were outside the method-recommended limit of 25% to 150% for the method blank 320-107572/1-A. However, according to the laboratory, quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined? \square Yes \square No \square NA (Please explain.)

The data did not require flags.

iv. Data quality or usability affected? (Use the comment box to explain.) Comments:

The data quality and usability were unaffected.

- 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.)
 - \square Yes \square No \square NA (Please explain.)

Comments:

Comments:

PFCs are not volatile compounds, so a trip blank is not required.

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

No trip blank is required; see above.

iii. All results less than PQL? ☐Yes ☐ No ☐NA (Please explain.)

Comments:

No trip blank is required; see above.

iv. If above PQL, what samples are affected?

Comments:

No trip blank is required; see above.

v. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples? Xes No NA (Please explain.) Comments:

ii. Submitted blind to lab? ∑Yes □ No □NA (Please explain.)

Comments:

The field duplicate pairs "167754" / "167854" and "526576" / "526676" were submitted with this work order.

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

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

Where R_1 = Sample Concentration
 R_2 = Field Duplicate ConcentrationYes \boxtimes No \square NA (Please explain.)Comments:

For the field duplicat pair "167754" / "167854" the following analytes did not meet recommended RPD criteria: PFNA RPD = 36%, and PFHxDA RPD = 65%. The RPD values for the other PFC analytes, where calculable for detected results, meet QC criteria.

For the field duplicate pair "526576" / "526676", the following analytes did not meet recommended RPD criteria: PFTeA RPD = 86%, and PFHpS RPD = 53%. The RPD values for the other PFC analytes, where calculable for detected results, meet QC criteria.

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

Comments:

Data quality for PFNA and PFHxDA results in the field duplicate pair "167754" / "167854" is considered affected. The results are considered estimated and flagged 'J*' where not already qualified.

Data quality for PFTeA and PFHpS results in the field duplicate pair "526576" / "526676" is considered affected. The results are considered estimated and flagged 'J*' where not already qualified.

f. Decontamination or Equipment Blank (If not used explain why).

 Yes
 No
 NA (Please explain.)
 Comments:

 Reusable equipment was not used in sample collection for this work order, so an equipment blank is not required.
 Comments:

i. All results less than PQL?

 \Box Yes \Box No \boxtimes NA (Please explain.)

N/A; an equipment blank was not required.

ii. If above PQL, what samples are affected?

Comments:

N/A; an equipment blank was not required.

iii. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

- 7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
 - a. Defined and appropriate?
 - $\Box Y es \Box No \boxtimes NA (Please explain.)$

Comments:



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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

TestAmerica Job ID: 320-19030-1 Client Project/Site: City of Fairbanks Fire Training Area

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

Attn: Julie Keener



Authorized for release by: 6/23/2016 12:22:49 PM

David Alltucker, Project Manager I (916)374-4383 david.alltucker@testamericainc.com

LINKS





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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

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

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Definitions/Glossary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Qualifiers

LCMS	
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LCMS	
Qualifier	Qualifier Description
*	Isotope Dilution analyte is outside acceptance limits.
*	LCS or LCSD is outside acceptance limits.
В	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
Н	Sample was prepped or analyzed beyond the specified holding time
*	RPD of the LCS and LCSD exceeds the control limits

Glossary

bbreviation	These commonly used abbreviations may or may not be present in this report.
	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
NF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
/IDA	Minimum detectable activity
DL	Estimated Detection Limit
/IDC	Minimum detectable concentration
/IDL	Method Detection Limit
ΛL	Minimum Level (Dioxin)
1C	Not Calculated
1D	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
ΈF	Toxicity Equivalent Factor (Dioxin)
EQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-19030-1

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Narrative

Job Narrative 320-19030-1

Receipt

The samples were received on 5/20/2016 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.9° C.

LCMS

Method(s) WS-LC-0025: One or more of the Isotope Dilution Analyte (IDA) recoveries is above the method recommended limit for the following samples: 95630 (320-19030-1), 471542 (320-19030-3), 582573 (320-19030-4), 597517-1 (320-19030-6) and 515485 (320-19030-7). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) WS-LC-0025: One or more of the The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: 471542 (320-19030-3), 582573 (320-19030-4), 593460-2 (320-19030-10), 593460-1 (320-19030-12), MW-207A (320-19030-14) and MW-504 (320-19030-15). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method(s) WS-LC-0025: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for prep batch 110951 had low recoveries for Perfluoro-n-octandecanoic acid (PFODA). The samples were re-extracted out of hold time and the reanalysis has the LCS and LCSD in control for this compound. Both sets of data are reported for this compound. The following samples are impacted. 95630 (320-19030-1), 95730 (320-19030-2), 471542 (320-19030-3), 671300 (320-19030-5), 597517-1 (320-19030-6), 515485 (320-19030-7), (LCS 320-110951/2-A) and (LCSD 320-110951/3-A)

Method(s) WS-LC-0025: The laboratory control sample (LCS) and laboratory control sample duplicate for prep batch 111096 had low recovery for Perfluoro-n-octandecanoic acid (PFODA). The samples were re-extracted out of hold time and the reanalysis has the LCS and LCSD in control for this compound. Both sets of data are reported for this compound. The following samples are impacted. 597507 (320-19030-9), 593460-2 (320-19030-10), 563555-1 (320-19030-11), 593460-1 (320-19030-12), 597517-2 (320-19030-13), MW-207A (320-19030-14), MW-504 (320-19030-15), (LCS 320-111096/2-A), (320-18954-A-11-A), (320-18954-A-11-B MS) and (320-18954-A-11-C MSD)

Method(s) WS-LC-0025: The laboratory control sample duplicate (LCSD) for prep batch 112821 recovered outside control limits for the following analytes: Perfluoro-n-octandecanoic acid (PFODA). The samples were either non-detect or J flagged below the reporting limit with the exception of samples 597507 (320-19030-9), which was detected at the reporting limit. As this was a re-extraction, no additional sample remains to perfom another extraction.

Method(s) WS-LC-0025: Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following sample: 563555-1 (320-19030-11). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) WS-LC-0025: The following sample was re-extracted in prep batch 103509 but the analysis shows the sample wasn't spiked with the IDA compounds so it can't be quantified for perfluoro-n-octandecanoic acid (PFODA). The sample was used up in the re-extraction so a second re-extraction isn't possible. The original results are reported for this sample. 582573 (320-19030-4)

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

Organic Prep

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 320-110951.

Method(s) 3535: These samples 95630 (320-19030-1), 95730 (320-19030-2), 471542 (320-19030-3), 582573 (320-19030-4), 671300 (320-19030-5), 597517-1 (320-19030-6), 515485 (320-19030-7) and 521779 (320-19030-8) came with a light yellowish orange color, but there was no sediment on the bottom.

Method(s) 3535: These samples 597507 (320-19030-9), 593460-2 (320-19030-10), 563555-1 (320-19030-11), 593460-1

Job ID: 320-19030-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

(320-19030-12), 597517-2 (320-19030-13), MW-207A (320-19030-14) and MW-504 (320-19030-15) contain an orange color.

Method(s) 3535: These samples MW-207A (320-19030-14) and MW-504 (320-19030-15) came in containing some kind of dark orange residue on the bottom.

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 320-112821.

Method(s) 3535: The following samples 597507 (320-19030-9), 593460-2 (320-19030-10), 563555-1 (320-19030-11), 593460-1 (320-19030-12), 597517-2 (320-19030-13), MW-207A (320-19030-14) and MW-504 (320-19030-15) was re-prepared outside of preparation holding time due to low recovery in the LCS. Therefore, a second bottle was used for the re-extraction.

Method(s) 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with analytical batch 320-113509.

Method(s) 3535: The following samples 95630 (320-19030-1), 95730 (320-19030-2), 471542 (320-19030-3), 582573 (320-19030-4), 671300 (320-19030-5), 597517-1 (320-19030-6), 515485 (320-19030-7) and 521779 (320-19030-8) was re-prepared outside of preparation holding time due to low LCS and LCSD recoveries for one compound.

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

Client Sample ID: 95630

Lab Sample ID: 320-19030-1

Lab Sample ID: 320-19030-2

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Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.7 B	1.9	0.43 ng/L	1 WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	5.9 B	1.9	0.92 ng/L	1 WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	6.7	1.9	0.73 ng/L	1 WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.9	1.9	0.75 ng/L	1 WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.1	1.9	0.70 ng/L	1 WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.75 J	1.9	0.61 ng/L	1 WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.42 J	1.9	0.41 ng/L	1 WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.57 J	1.9	0.55 ng/L	1 WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.3 JB	1.9	0.19 ng/L	1 WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.4	1.9	0.11 ng/L	1 WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	2.0 *	1.9	0.63 ng/L	1 WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.4	1.9	0.86 ng/L	1 WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	12	1.9	0.81 ng/L	1 WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	16	1.9	1.2 ng/L	1 WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	4.3 H	1.9	0.65 ng/L	1 WS-LC-0025	Total/NA

Client Sample ID: 95730

Result Qualifier Dil Fac D Method Analyte RL MDL Unit Prep Type 4.1 B WS-LC-0025 Perfluorobutanoic acid (PFBA) 1.8 Total/NA 0.41 ng/L 1 Perfluoropentanoic acid (PFPeA) 6.1 B 1.8 0.89 ng/L 1 WS-LC-0025 Total/NA Perfluorohexanoic acid (PFHxA) WS-LC-0025 Total/NA 74 1.8 0.70 ng/L 1 Perfluoroheptanoic acid (PFHpA) 2.6 1.8 0.72 ng/L 1 WS-LC-0025 Total/NA Perfluorooctanoic acid (PFOA) 4.2 1.8 0.67 ng/L WS-LC-0025 Total/NA 1 Perfluorononanoic acid (PFNA) 0.96 J 1.8 0.59 ng/L 1 WS-LC-0025 Total/NA Perfluorodecanoic acid (PFDA) 0.55 J 1.8 0.39 ng/L 1 WS-LC-0025 Total/NA Perfluorododecanoic acid (PFDoA) 0.52 ng/L Total/NA 0.57 J 1.8 1 WS-LC-0025 Perfluorotetradecanoic acid (PFTeA) 0.99 JB 1.8 0.18 ng/L 1 WS-LC-0025 Total/NA 0.78 J 0.11 ng/L WS-LC-0025 Total/NA Perfluoro-n-hexadecanoic acid 1.8 1 (PFHxDA) 1.6 J* 0.60 ng/L WS-LC-0025 Total/NA 1.8 1 Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) 2.6 1.8 0.82 ng/L 1 WS-LC-0025 Total/NA Perfluorohexane Sulfonate (PFHxS) 15 0.78 ng/L Total/NA 1.8 1 WS-LC-0025 17 Total/NA Perfluorooctane Sulfonate (PFOS) 1.8 1.1 ng/L 1 WS-LC-0025 3.7 H 1.9 0.63 ng/L WS-LC-0025 Total/NA Perfluoro-n-octandecanoic acid 1 (PFODA) - RE

Client Sample ID: 471542

Lab Sample ID: 320-19030-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.2	B	1.8	0.40	ng/L	1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	2.2	В	1.8	0.87	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	1.4	J	1.8	0.69	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.0	J	1.8	0.71	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	1.2	J	1.8	0.66	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.40	J	1.8	0.39	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.1	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Detection Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 471542 (Continued)

Lab Sample ID: 320-19030-3

Lab Sample ID: 320-19030-4

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Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.8		1.8	0.11	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	2.2	*	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	0.93	J	1.8	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	2.0		1.8	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	2.6	Н	1.9	0.65	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 582573

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.3	B	1.8	0.42	ng/L	1 _	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	2.4	В	1.8	0.90	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	3.1		1.8	0.71	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.2	J	1.8	0.73	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	1.7	J	1.8	0.68	ng/L	1	WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.57	J	1.8	0.53	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.2	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.89	J *	1.8	0.61	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.5	J	1.8	0.83	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	8.5		1.8	0.79	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	11		1.8	1.2	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 671300

Lab Sample ID: 320-19030-5

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	7.4 B	1.8	0.41 ng/L	1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	8.3 B	1.8	0.88 ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	8.0	1.8	0.70 ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.0	1.8	0.71 ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	6.3	1.8	0.67 ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.5 J	1.8	0.58 ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.86 J	1.8	0.39 ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.3 JB	1.8	0.18 ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.62 J	1.8	0.11 ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	2.1 *	1.8	0.60 ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.4	1.8	0.82 ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	12	1.8	0.78 ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	20	1.8	1.1 ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	1.6 JH	1.8	0.62 ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 597517-1

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac	D Method	Prep Type
Perfluorobutanoic acid (PFBA)	3.8 B	1.8	0.42 ng/L	1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	6.8 B	1.8	0.90 ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	6.8	1.8	0.71 ng/L	1	WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Lab Sample ID: 320-19030-6

Client Sample ID: 597517-1 (Continued)

Lab Sample ID: 320-19030-6

Lab Sample ID: 320-19030-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	3.2		1.8	0.73	ng/L		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	4.5		1.8	0.68	ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.86	J	1.8	0.59	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.96	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA)	0.84	J *	1.8	0.61	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	3.2		1.8	0.83	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	22		1.8	0.79	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	12		1.8	1.2	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 515485

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	8.5	B	1.8	0.41	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	10	В	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	8.7		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.2		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	6.1		1.8	0.67	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.0	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.90	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	2.4		1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	14		1.8	0.78	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	24		1.8	1.1	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.65	J	1.8	0.57	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 521779

Lab Sample ID: 320-19030-8

Lab Sample ID: 320-19030-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	4.0	B	1.8	0.41	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	4.9	В	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	4.6		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.0		1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.7		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.75	J	1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.86	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid	2.8	*	1.8	0.61	ng/L	1		WS-LC-0025	Total/NA
(PFODA) Perfluorobutane Sulfonate (PFBS)	1.6	J	1.8	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	8.3		1.8	0.79	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	9.3		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 597507

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	1.5	JB	1.8	0.41	ng/L	1	-	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	1.6	J	1.8	0.89	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	2.3		1.8	0.71	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.1	J	1.8	0.72	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.7		1.8	0.68	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.8		1.8	0.59	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	1.8		1.8	0.40	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 597507 (Continued)

Lab Sample ID: 320-19030-10

Lab Sample ID: 320-19030-9

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Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluoroundecanoic acid (PFUnA)	0.90	JB	1.8	0.68	ng/L	1	WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.58	J	1.8	0.53	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.79	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	4.0		1.8	0.79	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	11		1.8	1.2	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	1.5	JHB*	1.9	0.63	ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 593460-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.8	B	1.8	0.41	ng/L	1	WS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	4.4		1.8	0.88	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	5.3		1.8	0.70	ng/L	1	WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.72	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	5.5		1.8	0.67	ng/L	1	WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.8		1.8	0.58	ng/L	1	WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	1.6	J	1.8	0.39	ng/L	1	WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.1	JB	1.8	0.67	ng/L	1	WS-LC-0025	Total/NA
Perfluorododecanoic acid (PFDoA)	0.88	J	1.8	0.52	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.1	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.96	J	1.8	0.11	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.9		1.8	0.82	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	12		1.8	0.78	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-1-heptanesulfonate (PFHpS)	0.75	J	1.8	0.64	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	31		1.8	1.1	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	10		1.8	0.57	ng/L	1	WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	1.9	H B *	1.9		ng/L	1	WS-LC-0025	Total/NA

Client Sample ID: 563555-1

Analyte

(PFODA) - RE

Lab Sample ID: 320-19030-11 **Result Qualifier** RL MDL Unit Dil Fac D Method Prep Type Perfluoropentanoic acid (PFPeA) 1.7 J 1.8 0.89 ng/L 1 WS-LC-0025 Total/NA Perfluorohexanoic acid (PFHxA) 1.3 J 1.8 0.71 ng/L 1 WS-LC-0025 Total/NA 0.68 ng/L Perfluorooctanoic acid (PFOA) 0.94 J 1.8 WS-LC-0025 Total/NA 1 Perfluorotetradecanoic acid (PFTeA) 0.69 JB 1.8 0.18 ng/L 1 WS-LC-0025 Total/NA Perfluorohexane Sulfonate (PFHxS) 1.3 J 1.8 0.79 ng/L 1 WS-LC-0025 Total/NA Perfluorooctane Sulfonate (PFOS) 2.3 1.2 ng/L 1 WS-LC-0025 Total/NA 1.8 0.67 JHB 1.9 0.63 ng/L WS-LC-0025 Total/NA 1 Perfluoro-n-octandecanoic acid

Client Sample ID: 593460-1

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D N	lethod	Prep Type
Perfluorobutanoic acid (PFBA)	2.8 B	1.8	0.42 ng/L		VS-LC-0025	Total/NA
Perfluoropentanoic acid (PFPeA)	3.1	1.8	0.91 ng/L	1 V	VS-LC-0025	Total/NA
Perfluorohexanoic acid (PFHxA)	3.9	1.8	0.72 ng/L	1 V	VS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.7 J	1.8	0.73 ng/L	1 W	VS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	3.1	1.8	0.69 ng/L	1 W	VS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Lab Sample ID: 320-19030-12

TestAmerica Sacramento

Client Sample ID: 593460-1 (Continued)

Lab Sample ID: 320-19030-12

Lab Sample ID: 320-19030-13

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Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	1.2	J	1.8	0.60	ng/L	1		WS-LC-0025	Total/NA
Perfluorodecanoic acid (PFDA)	0.91	J	1.8	0.40	ng/L	1		WS-LC-0025	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.83	JB	1.8	0.69	ng/L	1		WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	1.0	JB	1.8	0.18	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.44	J	1.8	0.11	ng/L	1		WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.8		1.8	0.84	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	7.5		1.8	0.80	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	17		1.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctane Sulfonamide (FOSA)	1.1	J	1.8	0.58	ng/L	1		WS-LC-0025	Total/NA
Perfluoro-n-octandecanoic acid (PFODA) - RE	1.2	JHB	1.9	0.64	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: 597517-2

RL Analyte **Result Qualifier** MDL Unit Dil Fac D Method Prep Type 3.5 B Perfluorobutanoic acid (PFBA) 1.8 0.41 ng/L 1 WS-LC-0025 Total/NA Perfluoropentanoic acid (PFPeA) 7.5 1.8 0.88 ng/L WS-LC-0025 Total/NA 1 Perfluorohexanoic acid (PFHxA) 13 1.8 0.70 ng/L 1 WS-LC-0025 Total/NA Perfluoroheptanoic acid (PFHpA) 2.5 1.8 0.72 ng/L 1 WS-LC-0025 Total/NA Perfluorooctanoic acid (PFOA) 5.7 1.8 0.67 ng/L 1 WS-LC-0025 Total/NA Perfluorononanoic acid (PFNA) 0.68 J 1.8 0.59 ng/L 1 WS-LC-0025 Total/NA Total/NA Perfluorodecanoic acid (PFDA) 0.82 J 0.39 ng/L WS-LC-0025 1.8 1 Perfluorotetradecanoic acid (PFTeA) Total/NA 0.78 JB 1.8 0.18 ng/L 1 WS-LC-0025 Perfluorobutane Sulfonate (PFBS) 8.1 1.8 0.82 ng/L Total/NA 1 WS-LC-0025 Perfluorohexane Sulfonate (PFHxS) 0.78 ng/L Total/NA 40 1.8 1 WS-LC-0025 0.64 ng/L Total/NA Perfluoro-1-heptanesulfonate 1.4 J 1.8 1 WS-LC-0025 (PFHpS) Perfluorooctane Sulfonate (PFOS) 38 1.8 WS-LC-0025 Total/NA 1.1 ng/L 1 0.63 ng/L Total/NA Perfluoro-n-octandecanoic acid 0.89 JHB 1.9 1 WS-LC-0025 (PFODA) - RE

Client Sample ID: MW-207A

Lab Sample ID: 320-19030-14 Analyte **Result Qualifier** RL MDL Unit Dil Fac D Method Prep Type Perfluorobutanoic acid (PFBA) 3.3 B 1.7 0.40 ng/L WS-LC-0025 Total/NA 1 Perfluoropentanoic acid (PFPeA) 5.2 1.7 0.86 ng/L 1 WS-LC-0025 Total/NA Perfluorohexanoic acid (PFHxA) Total/NA 9.5 1.7 0.69 ng/L 1 WS-LC-0025 Perfluoroheptanoic acid (PFHpA) 24 1.7 0.70 ng/L 1 WS-LC-0025 Total/NA Perfluorooctanoic acid (PFOA) 4.7 1.7 0.65 ng/L 1 WS-LC-0025 Total/NA 0.71 J Perfluorononanoic acid (PFNA) 1.7 0.57 ng/L 1 WS-LC-0025 Total/NA 0.82 JB Total/NA Perfluorotetradecanoic acid (PFTeA) 1.7 0.17 ng/L 1 WS-LC-0025 0.30 J 0.11 ng/L WS-LC-0025 Total/NA Perfluoro-n-hexadecanoic acid 1.7 1 (PFHxDA) Perfluorobutane Sulfonate (PFBS) 3.7 Total/NA 1.7 0.80 ng/L 1 WS-LC-0025 Perfluorohexane Sulfonate (PFHxS) 21 1.7 0.76 ng/L 1 WS-LC-0025 Total/NA 1.3 J 1.7 0.62 ng/L WS-LC-0025 Total/NA 1 Perfluoro-1-heptanesulfonate (PFHpS) Perfluorooctane Sulfonate (PFOS) 38 WS-LC-0025 Total/NA 1.7 1.1 ng/L 1 Lab Sample ID: 320-19030-15

Client Sample ID: MW-504

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: MW-504 (Continued)

Lab Sample ID: 320-19030-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.8		1.8	0.70	ng/L		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.0	J	1.8	0.71	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	2.6		1.8	0.66	ng/L	1	WS-LC-0025	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.76	JB	1.8	0.18	ng/L	1	WS-LC-0025	Total/NA
Perfluorobutane Sulfonate (PFBS)	1.1	J	1.8	0.81	ng/L	1	WS-LC-0025	Total/NA
Perfluorohexane Sulfonate (PFHxS)	0.88	J	1.8	0.77	ng/L	1	WS-LC-0025	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.7	J	1.8	1.1	ng/L	1	WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

Client Sample Results

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-1

Matrix: Water

Client Sample ID: 95630 Date Collected: 05/16/16 10:46

Date Received: 05/20/16 09:40

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.7	В	1.9	0.43	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluoropentanoic acid (PFPeA)	5.9	В	1.9	0.92	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluorohexanoic acid (PFHxA)	6.7		1.9	0.73	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluoroheptanoic acid (PFHpA)	2.9		1.9	0.75	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluorooctanoic acid (PFOA)	4.1		1.9	0.70	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluorononanoic acid (PFNA)	0.75	J	1.9	0.61	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluorodecanoic acid (PFDA)	0.42	J	1.9	0.41	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluoroundecanoic acid (PFUnA)	ND		1.9	0.70	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluorododecanoic acid PFDoA)	0.57	J	1.9	0.55	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluorotridecanoic Acid (PFTriA)	ND		1.9	0.52	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluorotetradecanoic acid PFTeA)	1.3	JB	1.9	0.19	ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluoro-n-hexadecanoic acid PFHxDA)	2.4		1.9		ng/L		05/23/16 12:30	06/10/16 00:42	
Perfluoro-n-octandecanoic acid PFODA)	2.0	*	1.9		ng/L			06/10/16 00:42	
Perfluorobutane Sulfonate (PFBS)	2.4		1.9	0.86	0			06/10/16 00:42	
Perfluorohexane Sulfonate PFHxS)	12		1.9		ng/L			06/10/16 00:42	
erfluoro-1-heptanesulfonate PFHpS)	ND		1.9		ng/L			06/10/16 00:42	
Perfluorodecane sulfonate (PFDS)	ND		1.9		ng/L			06/10/16 00:42	
Perfluorooctane Sulfonate (PFOS)	16		1.9		ng/L		05/23/16 12:30	06/10/16 00:42	
erfluorooctane Sulfonamide (FOSA)	ND		1.9	0.60	ng/L		05/23/16 12:30	06/10/16 00:42	
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
3C8 FOSA	39		25 - 150				05/23/16 12:30	06/10/16 00:42	
3C4 PFBA	84		25 - 150				05/23/16 12:30	06/10/16 00:42	
3C2 PFHxA	119		25 - 150				05/23/16 12:30	06/10/16 00:42	
3C4 PFOA	133		25 - 150				05/23/16 12:30	06/10/16 00:42	
3C5 PFNA	119		25 - 150				05/23/16 12:30	06/10/16 00:42	
3C2 PFDA	124		25 - 150				05/23/16 12:30	06/10/16 00:42	
3C2 PFUnA	136		25 - 150				05/23/16 12:30	06/10/16 00:42	
3C2 PFDoA	127		25 - 150				05/23/16 12:30	06/10/16 00:42	
802 PFHxS	152	*	25 - 150				05/23/16 12:30	06/10/16 00:42	
3C4 PFOS	153	*	25 - 150				05/23/16 12:30	06/10/16 00:42	
3C4-PFHpA	126		25 - 150				05/23/16 12:30	06/10/16 00:42	
3C5 PFPeA	120		25 - 150				05/23/16 12:30	06/10/16 00:42	
Nethod: WS-LC-0025 - Perfluo		drocarbon Qualifier	s - RE _{RL}	МОЛ	Unit	D	Proparad	Analyzad	Dil Fa
			1.9		ng/L		Prepared	Analyzed	
Perfluoro-n-octandecanoic acid PFODA)	4.3		1.9	0.05	ng/L		06/13/16 09:50		
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C2 PFDoA	118		25 - 150				06/13/16 09:50	06/16/16 08:51	

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-2 Matrix: Water

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Client Sample ID: 95730 Date Collected: 05/16/16 10:50 Date Received: 05/20/16 09:40

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.1	В	1.8	0.41	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoropentanoic acid (PFPeA)	6.1	В	1.8	0.89	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorohexanoic acid (PFHxA)	7.4		1.8	0.70	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoroheptanoic acid (PFHpA)	2.6		1.8	0.72	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorooctanoic acid (PFOA)	4.2		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorononanoic acid (PFNA)	0.96	J	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorodecanoic acid (PFDA)	0.55	J	1.8	0.39	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorododecanoic acid (PFDoA)	0.57	J	1.8	0.52	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorotetradecanoic acid (PFTeA)	0.99	JB	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoro-n-hexadecanoic acid PFHxDA)	0.78	J	1.8		ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluoro-n-octandecanoic acid (PFODA)	1.6	J *	1.8		ng/L			06/10/16 01:04	1
Perfluorobutane Sulfonate (PFBS)	2.6		1.8	0.82	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorohexane Sulfonate PFHxS)	15		1.8		ng/L		05/23/16 12:30	06/10/16 01:04	1
^p erfluoro-1-heptanesulfonate PFHpS)	ND		1.8	0.64	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorooctane Sulfonate (PFOS)	17		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:04	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.57	ng/L		05/23/16 12:30	06/10/16 01:04	1
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
3C8 FOSA	37		25 - 150				05/23/16 12:30	06/10/16 01:04	1
3C4 PFBA	78		25 - 150				05/23/16 12:30	06/10/16 01:04	1
I3C2 PFHxA	113		25 - 150				05/23/16 12:30	06/10/16 01:04	1
3C4 PFOA	124		25 - 150				05/23/16 12:30	06/10/16 01:04	1
I3C5 PFNA	114		25 - 150				05/23/16 12:30	06/10/16 01:04	1
3C2 PFDA	115		25 - 150				05/23/16 12:30	06/10/16 01:04	1
3C2 PFUnA	125		25 - 150				05/23/16 12:30	06/10/16 01:04	1
13C2 PFDoA	123		25 - 150				05/23/16 12:30	06/10/16 01:04	1
18O2 PFHxS	136		25 - 150				05/23/16 12:30	06/10/16 01:04	1
3C4 PFOS	147		25 - 150				05/23/16 12:30	06/10/16 01:04	1
13C4-PFHpA	119		25 - 150				05/23/16 12:30	06/10/16 01:04	1
3C5 PFPeA	114		25 - 150				05/23/16 12:30	06/10/16 01:04	1
Method: WS-LC-0025 - Perfluo Analyte		drocarbons Qualifier	- RE RL	יחא	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid PFODA)	3.7		1.9		ng/L			06/16/16 09:12	1
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDoA	100	quanner	25 - 150				· · ·	06/16/16 09:12	1 1

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Client Sample ID: 471542 Date Collected: 05/16/16 11:34 Date Received: 05/20/16 09:40

TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-3 Matrix: Water

Analyte		Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.2		1.8	0.40	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoropentanoic acid (PFPeA)	2.2	В	1.8	0.87	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorohexanoic acid (PFHxA)	1.4	J	1.8	0.69	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoroheptanoic acid (PFHpA)	1.0	J	1.8	0.71	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorooctanoic acid (PFOA)	1.2	J	1.8	0.66	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.58	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorodecanoic acid (PFDA)	0.40	J	1.8	0.39	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.66	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorotetradecanoic acid (PFTeA)	1.1	JB	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	1.8		1.8	0.11	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoro-n-octandecanoic acid (PFODA)	2.2	*	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorobutane Sulfonate (PFBS)	0.93	J	1.8	0.81	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorohexane Sulfonate (PFHxS)	2.0		1.8	0.77	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.63	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorooctane Sulfonate (PFOS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 01:25	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.56	ng/L		05/23/16 12:30	06/10/16 01:25	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	6	*	25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C4 PFBA	81		25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C2 PFHxA	103		25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C4 PFOA	95		25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C5 PFNA	77		25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C2 PFDA	65		25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C2 PFUnA	70		25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C2 PFDoA	77		25 - 150				05/23/16 12:30	06/10/16 01:25	1
18O2 PFHxS	144		25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C4 PFOS	151	*	25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C4-PFHpA	107		25 - 150				05/23/16 12:30	06/10/16 01:25	1
13C5 PFPeA	106		25 - 150				05/23/16 12:30	06/10/16 01:25	1
Method: WS-LC-0025 - Perfluc						_			
Analyte		Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	2.6	н	1.9	0.65	ng/L		06/13/16 09:50	06/16/16 09:34	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDoA	83		25 - 150					06/16/16 09:34	1

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-19030-1

Client Sample ID: 582573 Date Collected: 05/16/16 12:41 Date Received: 05/20/16 09:40

Method: WS-LC-0025 - Perfluo Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Perfluorobutanoic acid (PFBA)	2.3	B	1.8	0.42	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluoropentanoic acid (PFPeA)	2.4	В	1.8	0.90	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorohexanoic acid (PFHxA)	3.1		1.8	0.71	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluoroheptanoic acid (PFHpA)	1.2	J	1.8	0.73	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorooctanoic acid (PFOA)	1.7	J	1.8	0.68	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorononanoic acid (PFNA)	ND		1.8	0.59	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorododecanoic acid (PFDoA)	0.57	J	1.8	0.53	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorotetradecanoic acid (PFTeA)	1.2	JB	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8		ng/L			06/10/16 01:46	1	
Perfluoro-n-octandecanoic acid (PFODA)	0.89		1.8		ng/L			06/10/16 01:46	1	i
Perfluorobutane Sulfonate (PFBS)	1.5	J	1.8		ng/L			06/10/16 01:46	1	1
Perfluorohexane Sulfonate (PFHxS)	8.5		1.8		ng/L			06/10/16 01:46	1	í
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8		ng/L			06/10/16 01:46	1	
Perfluorodecane sulfonate (PFDS)	ND		1.8		ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorooctane Sulfonate (PFOS)	11		1.8		ng/L		05/23/16 12:30	06/10/16 01:46	1	
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/23/16 12:30	06/10/16 01:46	1	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
13C8 FOSA	8	*	25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C4 PFBA	88		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C2 PFHxA	114		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C4 PFOA	129		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C5 PFNA	105		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C2 PFDA	93		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C2 PFUnA	121		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C2 PFDoA	110		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
18O2 PFHxS	160	*	25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C4 PFOS	145		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C4-PFHpA	114		25 - 150				05/23/16 12:30	06/10/16 01:46	1	
13C5 PFPeA	114		25 - 150					06/10/16 01:46	1	

Client Sample ID: 671300 Date Collected: 05/16/16 14:24 Date Received: 05/20/16 09:40

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	7.4	B	1.8	0.41	ng/L	_	05/23/16 12:30	06/10/16 02:07	1
Perfluoropentanoic acid (PFPeA)	8.3	В	1.8	0.88	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorohexanoic acid (PFHxA)	8.0		1.8	0.70	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluoroheptanoic acid (PFHpA)	4.0		1.8	0.71	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorooctanoic acid (PFOA)	6.3		1.8	0.67	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorononanoic acid (PFNA)	1.5	J	1.8	0.58	ng/L		05/23/16 12:30	06/10/16 02:07	1

TestAmerica Sacramento

Lab Sample ID: 320-19030-5

Matrix: Water

Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Method: WS-LC-0025 - Perflu	orinated Hyd	drocarbon	s - RE						
13C5 PFPeA	107		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C4-PFHpA	124		25 - 150					06/10/16 02:07	1
13C4 PFOS	129		25 - 150				05/23/16 12:30	06/10/16 02:07	1
18O2 PFHxS	137		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C2 PFDoA	102		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C2 PFUnA	131		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C2 PFDA	123		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C5 PFNA	131		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C4 PFOA	132		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C2 PFHxA	114		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C4 PFBA	52		25 - 150				05/23/16 12:30	06/10/16 02:07	1
13C8 FOSA	38		25 - 150				05/23/16 12:30	06/10/16 02:07	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.57	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorooctane Sulfonate (PFOS)	20		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 02:07	1
(PFHpS) Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 02:07	1
(PFHxS) Perfluoro-1-heptanesulfonate	ND		1.8	0.64	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorohexane Sulfonate	12		1.8	0.78	ng/L		05/23/16 12:30	06/10/16 02:07	1
(PFODA) Perfluorobutane Sulfonate (PFBS)	2.4		1.8	0.82	ng/L		05/23/16 12:30	06/10/16 02:07	1
(PFHxDA) Perfluoro-n-octandecanoic acid	2.1	*	1.8	0.60	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluoro-n-hexadecanoic acid	0.62	J	1.8	0.11	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorotetradecanoic acid (PFTeA)	1.3	JB	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 02:07	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8		ng/L			06/10/16 02:07	1
			1.0	0.02			00/20/40 40 00	00/10/10 00.07	

RL

1.8

1.8

1.8

MDL Unit

0.39 ng/L

0.67 ng/L

0.52 ng/L

Project/Site: City of Fairbanks Fire Training Area

Result Qualifier

0.86 J

ND

ND

1.6 JH

%Recovery Qualifier

134

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Client Sample ID: 671300 Date Collected: 05/16/16 14:24 Date Received: 05/20/16 09:40

Perfluorodecanoic acid (PFDA)

Perfluoroundecanoic acid (PFUnA)

Perfluorododecanoic acid (PFDoA)

Perfluoro-n-octandecanoic acid

Client Sample ID: 597517-1

Date Collected: 05/16/16 16:21

Date Received: 05/20/16 09:40

(PFODA) Isotope Dilution

13C2 PFDoA

Client: Shannon & Wilson

Analyte

Lab Sample ID: 320-19030-5 Matrix: Water

05/23/16 12:30 06/10/16 02:07

05/23/16 12:30 06/10/16 02:07

05/23/16 12:30 06/10/16 02:07

Prepared

D

TestAmerica Job ID: 320-19030-1

Analyzed

Lab Sample ID: 320-19030-6 Matrix: Water

Analyzed

Dil Fac

06/13/16 09:50 06/16/16 10:16

06/13/16 09:50 06/16/16 10:16

Prepared

Method: WS-LC-0025 - Perfluori	inated Hydr	ocarbons							
Analyte	Result Q	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.8 B	3	1.8	0.42	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoropentanoic acid (PFPeA)	6.8 B	3	1.8	0.90	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorohexanoic acid (PFHxA)	6.8		1.8	0.71	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoroheptanoic acid (PFHpA)	3.2		1.8	0.73	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorooctanoic acid (PFOA)	4.5		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorononanoic acid (PFNA)	0.86 J	I	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 02:29	1

1.8

Limits

25 - 150

0.62 ng/L

TestAmerica Sacramento

Dil Fac

1

1

1

Client Sample ID: 597517-1 Date Collected: 05/16/16 16:21 Date Received: 05/20/16 09:40

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorotetradecanoic acid (PFTeA)	0.96	JB	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoro-n-hexadecanoic acid PFHxDA)	ND		1.8	0.11	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoro-n-octandecanoic acid (PFODA)	0.84	J *	1.8	0.61	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorobutane Sulfonate (PFBS)	3.2		1.8	0.83	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorohexane Sulfonate (PFHxS)	22		1.8	0.79	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8	0.65	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorooctane Sulfonate (PFOS)	12		1.8	1.2	ng/L		05/23/16 12:30	06/10/16 02:29	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/23/16 12:30	06/10/16 02:29	1
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
I3C8 FOSA	47		25 - 150				05/23/16 12:30	06/10/16 02:29	1
I3C4 PFBA	66		25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C2 PFHxA	118		25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C4 PFOA	135		25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C5 PFNA	130		25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C2 PFDA	134		25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C2 PFUnA	149		25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C2 PFDoA	129		25 - 150				05/23/16 12:30	06/10/16 02:29	1
18O2 PFHxS	151	*	25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C4 PFOS	146		25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C4-PFHpA	116		25 - 150				05/23/16 12:30	06/10/16 02:29	1
13C5 PFPeA	117		25 - 150				05/23/16 12:30	06/10/16 02:29	1
Method: WS-LC-0025 - Perfluc				MD	11	-	Dava and d	Anahmad	
Analyte		Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid PFODA)	ND	н	1.8	0.60	ng/L		06/13/16 09:50	06/16/16 11:41	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDoA	125		25 - 150				00/40/40 00 50	06/16/16 11:41	1

Client Sample ID: 515485 Date Collected: 05/16/16 17:10 Date Received: 05/20/16 09:40

Method: WS-LC-0025 - Perfluor	inated Hydrocarbons					
Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	8.5 B	1.8	0.41 ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluoropentanoic acid (PFPeA)	10 B	1.8	0.89 ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorohexanoic acid (PFHxA)	8.7	1.8	0.71 ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluoroheptanoic acid (PFHpA)	4.2	1.8	0.72 ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorooctanoic acid (PFOA)	6.1	1.8	0.67 ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorononanoic acid (PFNA)	1.0 J	1.8	0.59 ng/L	05/23/16 12:30	06/10/16 02:50	1

TestAmerica Sacramento

TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-6

Matrix: Water

6/23/2016

Matrix: Water

Lab Sample ID: 320-19030-7

RL

MDL Unit

D

Prepared

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Result Qualifier

Client Sample ID: 515485 Date Collected: 05/16/16 17:10 Date Received: 05/20/16 09:40

Analyte

TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-7 Matrix: Water

Analyzed

Dil Fac

Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.67	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorotetradecanoic acid (PFTeA)	0.90	JB	1.8	0.18	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluoro-n-octandecanoic acid (PFODA)	ND	*	1.8	0.61	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorobutane Sulfonate (PFBS)	2.4		1.8	0.83	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorohexane Sulfonate (PFHxS)	14		1.8	0.78	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8		ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorooctane Sulfonate (PFOS)	24		1.8	1.1	ng/L	05/23/16 12:30	06/10/16 02:50	1
Perfluorooctane Sulfonamide (FOSA)	0.65	J	1.8	0.57	ng/L	05/23/16 12:30	06/10/16 02:50	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C8 FOSA	64		25 - 150			05/23/16 12:30	06/10/16 02:50	1
13C4 PFBA	55		25 - 150			05/23/16 12:30	06/10/16 02:50	1
13C2 PFHxA	111		25 - 150			05/23/16 12:30	06/10/16 02:50	1
13C4 PFOA	126		25 - 150			05/23/16 12:30	06/10/16 02:50	1
13C5 PFNA	126		25 - 150			05/23/16 12:30	06/10/16 02:50	1
13C2 PFDA	133		25 - 150			05/23/16 12:30	06/10/16 02:50	1
13C2 PFUnA	151	*	25 - 150			05/23/16 12:30	06/10/16 02:50	1
13C2 PFDoA	132		25 - 150			05/23/16 12:30	06/10/16 02:50	1
18O2 PFHxS	137		25 - 150			05/23/16 12:30	06/10/16 02:50	1
			05 450			05/23/16 12:30	06/10/16 02.50	1
13C4 PFOS	127		25 - 150			00/20/10 12.00	00/10/10 02.00	
13C4 PFOS 13C4-PFHpA	127 126		25 - 150 25 - 150				06/10/16 02:50	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid	ND	H	1.8	0.62	ng/L		06/13/16 09:50	06/16/16 12:03	1
(PFODA)									
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDoA	131		25 - 150				06/13/16 09:50	06/16/16 12:03	1

Client Sample ID: 521779 Date Collected: 05/16/16 15:10 Date Received: 05/20/16 09:40

Method: WS-LC-0025 - Perfluori	nated Hydroca	arbons						
Analyte	Result Qual	ifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	4.0 B	1.8	0.41	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoropentanoic acid (PFPeA)	4.9 B	1.8	0.89	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorohexanoic acid (PFHxA)	4.6	1.8	0.71	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoroheptanoic acid (PFHpA)	2.0	1.8	0.72	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorooctanoic acid (PFOA)	2.7	1.8	0.68	ng/L		05/23/16 12:30	06/10/16 04:15	1

TestAmerica Sacramento

Lab Sample ID: 320-19030-8

Matrix: Water

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 521779 Date Collected: 05/16/16 15:10 Date Received: 05/20/16 09:40

Method: WS-LC-0025 - Perfluc Analyte		Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	0.75	J	1.8	0.59	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorotetradecanoic acid (PFTeA)	0.86	JB	1.8	0.18	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	ND		1.8	0.11	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoro-n-octandecanoic acid (PFODA)	2.8	*	1.8	0.61	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorobutane Sulfonate (PFBS)	1.6	J	1.8	0.83	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorohexane Sulfonate (PFHxS)	8.3		1.8	0.79	ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8		ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorodecane sulfonate (PFDS)	ND		1.8		ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorooctane Sulfonate (PFOS)	9.3		1.8		ng/L		05/23/16 12:30	06/10/16 04:15	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/23/16 12:30	06/10/16 04:15	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	61		25 - 150				05/23/16 12:30	06/10/16 04:15	1
13C4 PFBA	76		25 - 150				05/23/16 12:30	06/10/16 04:15	
13C2 PFHxA	119		25 - 150				05/23/16 12:30	06/10/16 04:15	1
13C4 PFOA	134		25 - 150				05/23/16 12:30	06/10/16 04:15	1
13C5 PFNA	125		25 - 150				05/23/16 12:30	06/10/16 04:15	1
13C2 PFDA	126		25 - 150				05/23/16 12:30	06/10/16 04:15	
13C2 PFUnA	140		25 - 150				05/23/16 12:30	06/10/16 04:15	1
13C2 PFDoA	130		25 - 150				05/23/16 12:30	06/10/16 04:15	1
1802 PFHxS	130		25 - 150				05/23/16 12:30	06/10/16 04:15	1
13C4 PFOS	134		25 - 150				05/23/16 12:30	06/10/16 04:15	1
13C4-PFHpA	129		25 - 150					06/10/16 04:15	1
13C5 PFPeA	124		25 - 150					06/10/16 04:15	1
Method: WS-LC-0025 - Perfluc	orinated Hyd	drocarbon	s - RE						
Analyte		Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	ND	H	1.8	0.60	ng/L		06/13/16 09:50	06/16/16 12:24	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDoA	127		25 - 150				06/13/16 09:50	06/16/16 12:24	1
lient Sample ID: 597507 ate Collected: 05/17/16 11:56 ate Received: 05/20/16 09:40						L	.ab Sample	e ID: 320-19 Matrix:	
Method: WS-LC-0025 - Perfluc Analyte		drocarbon Qualifier	s RL	MDL		D	Prepared	Analyzed	Dil Fa

Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	1.5 J B	1.8	0.41	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluoropentanoic acid (PFPeA)	1.6 J	1.8	0.89	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorohexanoic acid (PFHxA)	2.3	1.8	0.71	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluoroheptanoic acid (PFHpA)	1.1 J	1.8	0.72	ng/L		05/24/16 12:47	06/02/16 20:40	1
Perfluorooctanoic acid (PFOA)	3.7	1.8	0.68	ng/L		05/24/16 12:47	06/02/16 20:40	1

TestAmerica Sacramento

TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-8

Matrix: Water

6/23/2016

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 597507 Date Collected: 05/17/16 11:56 Date Received: 05/20/16 09:40

TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-9 Matrix: Water

5 6

7

nalyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
erfluorononanoic acid (PFNA)	1.8		1.8	0.59			· ·	06/02/16 20:40	
erfluorodecanoic acid (PFDA)	1.8		1.8	0.40	-			06/02/16 20:40	
erfluoroundecanoic acid	0.90	JB	1.8	0.68	-		05/24/16 12:47	06/02/16 20:40	
FUnA)		• -							
erfluorododecanoic acid	0.58	J	1.8	0.53	ng/L		05/24/16 12:47	06/02/16 20:40	
FDoA) erfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	na/l		05/24/16 12:47	06/02/16 20:40	
erfluorotetradecanoic acid	0.79	JB	1.8	0.18	0			06/02/16 20:40	
FTeA)		• -							
erfluoro-n-hexadecanoic acid FHxDA)	ND		1.8	0.11	ng/L		05/24/16 12:47	06/02/16 20:40	
erfluoro-n-octandecanoic acid FODA)	ND		1.8	0.61	ng/L		05/24/16 12:47	06/02/16 20:40	
erfluorobutane Sulfonate (PFBS)	ND		1.8	0.83	ng/L		05/24/16 12:47	06/02/16 20:40	
erfluorohexane Sulfonate	4.0		1.8	0.79	ng/L		05/24/16 12:47	06/02/16 20:40	
/ FHxS) erfluoro-1-heptanesulfonate FHpS)	ND		1.8	0.64	ng/L		05/24/16 12:47	06/02/16 20:40	
erfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 20:40	
erfluorooctane Sulfonate (PFOS)	11		1.8		ng/L			06/02/16 20:40	
erfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	-			06/02/16 20:40	
otope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
3C8 FOSA	47		25 - 150				05/24/16 12:47	06/02/16 20:40	
C4 PFBA	60		25 - 150				05/24/16 12:47	06/02/16 20:40	
C2 PFHxA	101		25 - 150				05/24/16 12:47	06/02/16 20:40	
C4 PFOA	113		25 - 150				05/24/16 12:47	06/02/16 20:40	
BC5 PFNA	100		25 - 150				05/24/16 12:47	06/02/16 20:40	
BC2 PFDA	96		25 - 150					06/02/16 20:40	
3C2 PFUnA	99		25 - 150					06/02/16 20:40	
C2 PFDoA	93		25 - 150					06/02/16 20:40	
302 PFHxS	116		25 - 150					06/02/16 20:40	
3C4 PFOS	99		25 - 150					06/02/16 20:40	
3C4-PFHpA	106		25 - 150					06/02/16 20:40	
BC5 PFPeA	85		25 - 150					06/02/16 20:40	
ethod: WS-LC-0025 - Perflu	orinated Hy	drocarbon	e - PF						
nalyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
erfluoro-n-octandecanoic acid FODA)	1.5	JHB*	1.9		ng/L			06/12/16 12:28	
otope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
BC2 PFDoA	101		25 - 150				06/07/16 11:40	06/12/16 12:28	
ient Sample ID: 593460-							b Sample		

Method: WS-LC-0025 - Perfluori	nated Hyd	Irocarbons							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.8	В	1.8	0.41	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluoropentanoic acid (PFPeA)	4.4		1.8	0.88	ng/L		05/24/16 12:47	06/02/16 21:01	1
Perfluorohexanoic acid (PFHxA)	5.3		1.8	0.70	ng/L		05/24/16 12:47	06/02/16 21:01	1

TestAmerica Sacramento

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 593460-2 Date Collected: 05/17/16 14:02 Date Received: 05/20/16 09:40

TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-10 Matrix: Water

5 6 7

Method: WS-LC-0025 - Perfluo Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.72	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorooctanoic acid (PFOA)	5.5		1.8	0.67	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorononanoic acid (PFNA)	2.8		1.8	0.58	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorodecanoic acid (PFDA)	1.6	J	1.8	0.39	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluoroundecanoic acid	1.1	JB	1.8	0.67	ng/L		05/24/16 12:47	06/02/16 21:01	
(PFUnA)									
Perfluorododecanoic acid (PFDoA)	0.88	J	1.8	0.52	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorotetradecanoic acid	1.1	JB	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 21:01	
(PFTeA)									
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.96	J	1.8	0.11	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.60	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorobutane Sulfonate (PFBS)	1.9		1.8	0.82	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorohexane Sulfonate (PFHxS)	12		1.8	0.78	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluoro-1-heptanesulfonate (PFHpS)	0.75	J	1.8	0.64	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorooctane Sulfonate (PFOS)	31		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 21:01	
Perfluorooctane Sulfonamide (FOSA)	10		1.8	0.57	ng/L		05/24/16 12:47	06/02/16 21:01	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	3	*	25 - 150				05/24/16 12:47	06/02/16 21:01	
13C4 PFBA	72		25 - 150				05/24/16 12:47	06/02/16 21:01	
13C2 PFHxA	102		25 - 150				05/24/16 12:47	06/02/16 21:01	
13C4 PFOA	90		25 - 150				05/24/16 12:47	06/02/16 21:01	
13C5 PFNA	64		25 - 150				05/24/16 12:47	06/02/16 21:01	
13C2 PFDA	52		25 - 150				05/24/16 12:47	06/02/16 21:01	
13C2 PFUnA	57		25 - 150					06/02/16 21:01	
13C2 PFDoA	61		25 - 150					06/02/16 21:01	
1802 PFHxS	123		25 - 150					06/02/16 21:01	
13C4 PFOS	103		25 - 150					06/02/16 21:01	
13C4-PFHpA	105		25 - 150					06/02/16 21:01	
	83								
13C5 PFPeA			25 - 150				03/24/10 12.47	06/02/16 21:01	
Method: WS-LC-0025 - Perfluo Analyte		drocarbons Qualifier	s - RE RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Perfluoro-n-octandecanoic acid (PFODA)		HB*	1.9		ng/L			06/12/16 12:49	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C2 PFDoA	70		25 - 150				· ·	06/12/16 12:49	

Date Collected: 05/17/16 15:43 Date Received: 05/20/16 09:40

Matrix: Water

Method: WS-LC-0025 - Perflue	orinated Hydrocarbons					
Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND	1.8	0.41 ng/L	05/24/16 12:47	06/02/16 21:22	1

TestAmerica Sacramento

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Date Received: 05/20/16 09:40

Analyte

Perfluorobutanoic acid (PFBA)

Lab Sample ID: 320-19030-11 Matrix: Water

6

13

Method: WS-LC-0025 - Perfluo Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Perfluoropentanoic acid (PFPeA)	1.7	J	1.8	0.89	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorohexanoic acid (PFHxA)	1.3	J	1.8	0.71	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.72	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorooctanoic acid (PFOA)	0.94	J	1.8	0.68	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorononanoic acid (PFNA)	ND		1.8	0.59	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorodecanoic acid (PFDA)	ND		1.8	0.40	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.68	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.50	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorotetradecanoic acid PFTeA)	0.69	JB	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluoro-n-hexadecanoic acid PFHxDA)	ND		1.8	0.11	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluoro-n-octandecanoic acid (PFODA)	ND		1.8	0.61	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorobutane Sulfonate (PFBS)	ND		1.8		ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorohexane Sulfonate PFHxS)	1.3	J	1.8	0.79	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluoro-1-heptanesulfonate PFHpS)	ND		1.8	0.64	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorooctane Sulfonate (PFOS)	2.3		1.8	1.2	ng/L		05/24/16 12:47	06/02/16 21:22	
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.58	ng/L		05/24/16 12:47	06/02/16 21:22	
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
3C8 FOSA	33		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C4 PFBA	55		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C2 PFHxA	100		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C4 PFOA	103		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C5 PFNA	100		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C2 PFDA	95		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C2 PFUnA	103		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C2 PFDoA	100		25 - 150				05/24/16 12:47	06/02/16 21:22	
802 PFHxS	104		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C4 PFOS	91		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C4-PFHpA	97		25 - 150				05/24/16 12:47	06/02/16 21:22	
3C5 PFPeA	81		25 - 150				05/24/16 12:47	06/02/16 21:22	
Method: WS-LC-0025 - Perfluo		drocarbons Qualifier	s - RE RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Perfluoro-n-octandecanoic acid PFODA)		JHB	1.9		ng/L		06/07/16 11:40		_
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C2 PFDoA	181	*	25 - 150				06/07/16 11:40	06/12/16 14:15	
ient Sample ID: 593460- ate Collected: 05/17/16 16:47	1					La	ab Sample	ID: 320-190 Matrix:	
ate Received: 05/20/16 09:40									

Analyzed

Prepared

05/24/16 12:47 06/02/16 22:47

D

RL

1.8

MDL Unit

0.42 ng/L

Result Qualifier

2.8 B

Dil Fac

1

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: 593460-1 Date Collected: 05/17/16 16:47 Date Received: 05/20/16 09:40

TestAmerica Job ID: 320-19030-1

Lab Sample ID: 320-19030-12 Matrix: Water

5 6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropentanoic acid (PFPeA)	3.1		1.8	0.91	ng/L		05/24/16 12:47	06/02/16 22:47	
Perfluorohexanoic acid (PFHxA)	3.9		1.8	0.72	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoroheptanoic acid (PFHpA)	1.7	J	1.8	0.73	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorooctanoic acid (PFOA)	3.1		1.8	0.69	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorononanoic acid (PFNA)	1.2	J	1.8	0.60	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorodecanoic acid (PFDA)	0.91	J	1.8	0.40	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoroundecanoic acid (PFUnA)	0.83	JB	1.8	0.69	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.53	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8		ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluorotetradecanoic acid (PFTeA)	1.0	JB	1.8	0.18	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.44	J	1.8	0.11	ng/L		05/24/16 12:47	06/02/16 22:47	1
Perfluoro-n-octandecanoic acid (PFODA)	ND	*	1.8		ng/L		05/24/16 12:47	06/02/16 22:47	
Perfluorobutane Sulfonate (PFBS)	1.8		1.8		ng/L		05/24/16 12:47	06/02/16 22:47	
Perfluorohexane Sulfonate (PFHxS)	7.5		1.8	0.80	ng/L		05/24/16 12:47	06/02/16 22:47	
Perfluoro-1-heptanesulfonate (PFHpS)	ND		1.8		ng/L		05/24/16 12:47	06/02/16 22:47	
Perfluorodecane sulfonate (PFDS)	ND		1.8		ng/L		05/24/16 12:47	06/02/16 22:47	
Perfluorooctane Sulfonate (PFOS)	17		1.8	1.2	ng/L		05/24/16 12:47	06/02/16 22:47	
Perfluorooctane Sulfonamide (FOSA)	1.1	J	1.8	0.58	ng/L		05/24/16 12:47	06/02/16 22:47	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C8 FOSA	9	*	25 - 150				05/24/16 12:47	06/02/16 22:47	
13C4 PFBA	64		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C2 PFHxA	97		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C4 PFOA	113		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C5 PFNA	88		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C2 PFDA	81		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C2 PFUnA	81		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C2 PFDoA	78		25 - 150				05/24/16 12:47	06/02/16 22:47	
1802 PFHxS	113		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C4 PFOS	101		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C4-PFHpA	99		25 - 150				05/24/16 12:47	06/02/16 22:47	
13C5 PFPeA	80		25 - 150				05/24/16 12:47	06/02/16 22:47	

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RE Result Qualifier Analyte RL MDL Unit Prepared Analyzed Dil Fac D 1.9 0.64 ng/L 06/07/16 11:40 06/12/16 14:36 Perfluoro-n-octandecanoic acid 1.2 JHB 1 (PFODA) Isotope Dilution %Recovery Qualifier Limits Prepared Analyzed Dil Fac 13C2 PFDoA 91 25 - 150 06/07/16 11:40 06/12/16 14:36 1

TestAmerica Sacramento

RL

MDL Unit

D

Prepared

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Result Qualifier

Client Sample ID: 597517-2 Date Collected: 05/17/16 11:15 Date Received: 05/20/16 09:40

Analyte

Lab Sample ID: 320-19030-13 Matrix: Water

Analyzed

Perfluorobutanoic acid (PFBA)	3.5	B	1.8	0.41	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluoropentanoic acid (PFPeA)	7.5		1.8	0.88	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorohexanoic acid (PFHxA)	13		1.8	0.70	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluoroheptanoic acid (PFHpA)	2.5		1.8	0.72	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorooctanoic acid (PFOA)	5.7		1.8	0.67	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorononanoic acid (PFNA)	0.68	J	1.8	0.59	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorodecanoic acid (PFDA)	0.82	J	1.8	0.39	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.67	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.52	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorotridecanoic Acid (PFTriA)	ND		1.8	0.49	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorotetradecanoic acid	0.78	JB	1.8	0.18	ng/L	05/24/16 12:47	06/02/16 23:09	1
(PFTeA)								
Perfluoro-n-hexadecanoic acid	ND		1.8	0.11	ng/L	05/24/16 12:47	06/02/16 23:09	1
(PFHxDA)		<u>.</u>	4.0					
Perfluoro-n-octandecanoic acid	ND	*	1.8	0.60	ng/L	05/24/16 12:47	06/02/16 23:09	1
(PFODA) Perfluorobutane Sulfonate (PFBS)	8.1		1.8	0.82	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorohexane Sulfonate	40		1.8		ng/L		06/02/16 23:09	1
(PFHxS)	40		1.0	0.70	ng/L	03/24/10 12:4/	00/02/10 20:00	
Perfluoro-1-heptanesulfonate	1.4	J	1.8	0.64	ng/L	05/24/16 12:47	06/02/16 23:09	1
(PFHpS)					0			
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorooctane Sulfonate (PFOS)	38		1.8	1.1	ng/L	05/24/16 12:47	06/02/16 23:09	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.57	ng/L	05/24/16 12:47	06/02/16 23:09	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C8 FOSA	38		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C4 PFBA	54		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C2 PFHxA	104		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C4 PFOA	119		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C5 PFNA	106		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C2 PFDA	104		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C2 PFUnA	124		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C2 PFDoA	110		25 - 150			05/24/16 12:47	06/02/16 23:09	1
18O2 PFHxS	112		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C4 PFOS	105		25 - 150			05/24/16 12:47	06/02/16 23:09	1
13C4-PFHpA	108		25 - 150				06/02/16 23:09	1
13C5 PFPeA	85		25 - 150			05/24/16 12:47	06/02/16 23:09	1
Method: WS-LC-0025 - Perfluc								
Analyte		Qualifier	RL	MDL			Analyzed	Dil Fac
Perfluoro-n-octandecanoic acid (PFODA)	0.89	JHB	1.9	0.63	ng/L	06/07/16 11:40	06/12/16 14:57	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C2 PFDoA	107		25 - 150			06/07/16 11:40	06/12/16 14:57	1

RL

MDL Unit

D

Prepared

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Result Qualifier

Client Sample ID: MW-207A Date Collected: 05/17/16 14:27 Date Received: 05/20/16 09:40

Analyte

Lab Sample ID: 320-19030-14 Matrix: Water

Analyzed

Dil Fac

Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluorohexanoic acid (PFHpA) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluorodecanoic acid (PFDA) Perfluorodecanoic acid (PFDA) Perfluorodecanoic acid (PFDA) Perfluorotridecanoic acid (PFDA) Perfluorotridecanoic acid (PFDA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS) Perfluoro-1-heptanesulfonate	0.30 ND	J J B J	1.7 1.7	0.86 0.69 0.70 0.65 0.57 0.38 0.65 0.51 0.48 0.17 0.11	ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L		05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47	06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30	1 1 1 1 1 1 1 1 1 1 1
Perfluorohexanoic acid (PFHxA) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluorooctanoic acid (PFOA) Perfluorodecanoic acid (PFDA) Perfluoroundecanoic acid (PFUnA) Perfluorododecanoic acid (PFDoA) Perfluorotridecanoic acid (PFTriA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	9.5 2.4 4.7 0.71 ND ND ND 0.82 0.30 ND	J B J	1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	0.69 0.70 0.65 0.57 0.38 0.65 0.51 0.48 0.17 0.11	ng/L ng/L ng/L ng/L ng/L ng/L ng/L		05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47	06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30	1 1 1 1 1 1 1
Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluorooctanoic acid (PFOA) Perfluorodecanoic acid (PFDA) Perfluoroundecanoic acid (PFDA) Perfluorododecanoic acid (PFDA) Perfluorotetradecanoic acid (PFTriA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	2.4 4.7 0.71 ND ND 0.82 0.30 ND 0.30	J B J	1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	0.70 0.65 0.57 0.38 0.65 0.51 0.48 0.17 0.11	ng/L ng/L ng/L ng/L ng/L ng/L ng/L		05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47	06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30	1 1 1 1 1 1
Perfluorooctanoic acid (PFOA) Perfluorononanoic acid (PFNA) Perfluorodecanoic acid (PFDA) Perfluoroundecanoic acid (PFUA) Perfluorododecanoic acid (PFDA) Perfluorotetradecanoic acid (PFDA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	4.7 0.71 ND ND ND 0.82 0.30 ND 3.7	J B J	1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	0.65 0.57 0.38 0.65 0.51 0.48 0.17 0.11	ng/L ng/L ng/L ng/L ng/L ng/L		05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47	06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30	1 1 1 1 1
Perfluorononanoic acid (PFNA) Perfluorodecanoic acid (PFDA) Perfluoroundecanoic acid (PFUnA) Perfluorododecanoic acid (PFDoA) Perfluorotridecanoic acid (PFTriA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	0.71 ND ND ND 0.82 0.30 ND 3.7	J B J	1.7 1.7 1.7 1.7 1.7 1.7 1.7	0.57 0.38 0.65 0.51 0.48 0.17 0.11	ng/L ng/L ng/L ng/L ng/L		05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47	06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30	1 1 1 1
Perfluorononanoic acid (PFNA) Perfluorodecanoic acid (PFDA) Perfluoroundecanoic acid (PFUnA) Perfluorododecanoic acid (PFDoA) Perfluorotridecanoic acid (PFTriA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	ND ND ND 0.82 0.30 ND 3.7	J B J	1.7 1.7 1.7 1.7 1.7 1.7	0.38 0.65 0.51 0.48 0.17 0.11	ng/L ng/L ng/L ng/L ng/L		05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47	06/02/16 23:30 06/02/16 23:30 06/02/16 23:30 06/02/16 23:30	1 1 1 1
Perfluoroundecanoic acid (PFUnA) Perfluorododecanoic acid (PFDoA) Perfluorotridecanoic Acid (PFTriA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	ND ND 0.82 0.30 ND 3.7	J	1.7 1.7 1.7 1.7 1.7	0.65 0.51 0.48 0.17 0.11	ng/L ng/L ng/L ng/L		05/24/16 12:47 05/24/16 12:47 05/24/16 12:47 05/24/16 12:47	06/02/16 23:30 06/02/16 23:30 06/02/16 23:30	1 1 1
Perfluorododecanoic acid (PFDoA) Perfluorotridecanoic Acid (PFTriA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	ND ND 0.82 0.30 ND) 3.7	J	1.7 1.7 1.7 1.7	0.51 0.48 0.17 0.11	ng/L ng/L ng/L		05/24/16 12:47 05/24/16 12:47 05/24/16 12:47	06/02/16 23:30 06/02/16 23:30	1 1
Perfluorotridecanoic Acid (PFTriA) Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	ND 0.82 0.30 ND) 3.7	J	1.7 1.7 1.7	0.48 0.17 0.11	ng/L ng/L		05/24/16 12:47 05/24/16 12:47	06/02/16 23:30	1
Perfluorotetradecanoic acid (PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	0.82 0.30 ND	J	1.7 1.7	0.17 0.11	ng/L		05/24/16 12:47		
(PFTeA) Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	0.30 ND	J	1.7	0.11	-			06/02/16 23:30	1
Perfluoro-n-hexadecanoic acid (PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	ND) 3.7				ng/L		05/24/16 12:47		
(PFHxDA) Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	ND) 3.7				ng/L		05/24/16 12.47		
Perfluoro-n-octandecanoic acid (PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)) 3.7	*	1.7	0.50				06/02/16 23:30	1
(PFODA) Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)) 3.7	•	1.7				05/04/40 40 47	00/00/40 00:00	
Perfluorobutane Sulfonate (PFBS) Perfluorohexane Sulfonate (PFHxS)	•			0.59	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorohexane Sulfonate (PFHxS)	•		1.7	0.80	ng/L		05/24/16 12:47	06/02/16 23:30	1
(PFHxS)	21		1.7		ng/L		05/24/16 12:47		1
			1.7	0.70	iig/L		00/24/10 12.4/	00/02/10 23:30	
	1.3	J	1.7	0.62	ng/L		05/24/16 12:47	06/02/16 23:30	1
(PFHpS)					0				
Perfluorodecane sulfonate (PFDS)	ND		1.7	1.1	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorooctane Sulfonate (PFOS)) 38		1.7	1.1	ng/L		05/24/16 12:47	06/02/16 23:30	1
Perfluorooctane Sulfonamide (FOSA)	ND		1.7	0.56	ng/L		05/24/16 12:47	06/02/16 23:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	8	*	25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C4 PFBA	66		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C2 PFHxA	92		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C4 PFOA	91		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C5 PFNA	73		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C2 PFDA	68		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C2 PFUnA	71		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C2 PFDoA	75		25 - 150				05/24/16 12:47	06/02/16 23:30	1
18O2 PFHxS	118		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C4 PFOS	110		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C4-PFHpA	97		25 - 150				05/24/16 12:47	06/02/16 23:30	1
13C5 PFPeA	81		25 - 150				05/24/16 12:47	06/02/16 23:30	1
Mathady WOLLO 0005 Deafle	orinated Hy	drocarbon	s - RF						
Wethod: WS-LC-0025 - Pertil		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Method: WS-LC-0025 - Perflu Analyte	Result				ng/L				
Method: WS-LC-0025 - Perflu Analyte Perfluoro-n-octandecanoic acid (PFODA)	ND	Н	1.9	0.04	119/L		06/07/16 11:40	06/12/16 15:18	1
Analyte Perfluoro-n-octandecanoic acid			1.9 <i>Limits</i>	0.04	119/ L		06/07/16 11:40 Prepared	06/12/16 15:18 Analyzed	1 Dil Fac

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Client Sample ID: MW-504 Date Collected: 05/17/16 15:43 Date Received: 05/20/16 09:40

Lab Sample ID: 320-19030-15 Matrix: Water

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Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.8	0.41	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluoropentanoic acid (PFPeA)	ND		1.8	0.88	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorohexanoic acid (PFHxA)	4.8		1.8	0.70	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluoroheptanoic acid (PFHpA)	1.0	J	1.8	0.71	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorooctanoic acid (PFOA)	2.6		1.8	0.66	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorononanoic acid (PFNA)	ND		1.8	0.58	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorodecanoic acid (PFDA)	ND		1.8	0.39	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.66	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.52	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorotridecanoic Acid (PFTriA)	ND		1.8		ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorotetradecanoic acid	0.76	JB	1.8		ng/L		05/24/16 12:47	06/02/16 23:51	
(PFTeA)					0				
Perfluoro-n-hexadecanoic acid	ND		1.8	0.11	ng/L		05/24/16 12:47	06/02/16 23:51	
(PFHxDA)									
Perfluoro-n-octandecanoic acid	ND	*	1.8	0.60	ng/L		05/24/16 12:47	06/02/16 23:51	
(PFODA)			1.0				05/04/40 40 47	00/00/40 00 54	
Perfluorobutane Sulfonate (PFBS)	1.1		1.8		ng/L			06/02/16 23:51	
Perfluorohexane Sulfonate PFHxS)	0.88	J	1.8		ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluoro-1-heptanesulfonate PFHpS)	ND		1.8	0.63	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorodecane sulfonate (PFDS)	ND		1.8	1.1	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorooctane Sulfonate (PFOS)	1.7	J	1.8	1.1	ng/L		05/24/16 12:47	06/02/16 23:51	
Perfluorooctane Sulfonamide (FOSA)	ND		1.8	0.57	ng/L		05/24/16 12:47	06/02/16 23:51	
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
3C8 FOSA	1	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
3C4 PFBA	8	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
3C2 PFHxA	11	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
3C4 PFOA	13	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
3C5 PFNA	13	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
3C2 PFDA	11	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
3C2 PFUnA	10	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
3C2 PFDoA	10	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
802 PFHxS	12	*	25 - 150				05/24/16 12:47	06/02/16 23:51	
3C4 PFOS	10		25 - 150					06/02/16 23:51	
3C4-PFHpA	12		25 - 150					06/02/16 23:51	
3C5 PFPeA	10		25 - 150					06/02/16 23:51	
Method: WS-LC-0025 - Perfluo	rinated Hy	drocarbon	s - RF						
Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Perfluoro-n-octandecanoic acid PFODA)	ND		1.9		ng/L			06/12/16 15:40	
sotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C2 PFDoA	82	guunner	25 - 150				06/07/16 11:40		Dii Fa

Isotope Dilution Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area TestAmerica Job ID: 320-19030-1

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Method: WS-LC-0025 - Perfluorinated Hydrocarbons

320-19030-3

320-19030-3 - RE

471542

471542

			Porce	ent Isotope	Dilution Re	covery (Ac	centance I	imits)	
		308 E0S/		•			•	3C2 PFUn	3C2 PED
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150
320-19030-1	95630		84	119	133	119	124	136	127
20-19030-1 - RE	95630								118
20-19030-2	95730	37	78	113	124	114	115	125	123
20-19030-2 - RE	95730	01	10	110			110	120	100
20-19030-3	471542	6 *	81	103	95	77	65	70	77
20-19030-3 - RE	471542	Ū	0.						83
20-19030-4	582573	8 *	88	114	129	105	93	121	110
20-19030-5	671300	38	52	114	132	131	123	131	102
20-19030-5 - RE	671300		-						134
20-19030-6	597517-1	47	66	118	135	130	134	149	129
20-19030-6 - RE	597517-1		00	110	100	100	101	110	125
20-19030-7	515485	64	55	111	126	126	133	151 *	132
20-19030-7 - RE	515485	.				.20	100		131
20-19030-8	521779	61	76	119	134	125	126	140	130
20-19030-8 - RE	521779	01	.0		104	120	120	UTU I	127
20-19030-9	597507	47	60	101	113	100	96	99	93
20-19030-9 - RE	597507		00	101	110	100	00	00	101
20-19030-10	593460-2	3 *	72	102	90	64	52	57	61
20-19030-10 - RE	593460-2	0	12	102	00	04	02	01	70
20-19030-11	563555-1	33	55	100	103	100	95	103	100
20-19030-11 - RE	563555-1		00	100	100	100	00	100	181 *
20-19030-12	593460-1	9 *	64	97	113	88	81	81	78
20-19030-12 20-19030-12 - RE	593460-1	5	04	51	115	00	01	01	91
20-19030-13	597517-2	38	54	104	119	106	104	124	110
20-19030-13 20-19030-13 - RE	597517-2	50	54	104	115	100	104	124	107
20-19030-14	MW-207A	8 *	66	92	91	73	68	71	75
20-19030-14 - RE	MW-207A	0	00	52	51	10	00	71	56
20-19030-14 - ICE 20-19030-15	MW-504	1*	8 *	11 *	13 *	13 *	11 *	10 *	10 *
20-19030-15 - RE	MW-504		0		10	10		10	82
CS 320-110951/2-A	Lab Control Sample	28	119	123	126	125	127	132	130
CS 320-110931/2-A	Lab Control Sample	42	102	100	101	96	96	95	89
CS 320-112821/2-A	Lab Control Sample	42	102	100	101	30	30	35	98
CS 320-112621/2-A	Lab Control Sample								115
CSD 320-110951/3-A	Lab Control Sample Dup	28	114	121	131	123	127	131	123
CSD 320-110951/3-A	Lab Control Sample Dup	20	114	121	131	125	121	131	123
CSD 320-112821/3-A CSD 320-113509/3-A	Lab Control Sample Dup								126
IB 320-110951/1-A	Method Blank	20	128	131	111	120	138	148	120
IB 320-111095//1-A	Method Blank	29 39	128	108	144 115	139 115	107	140	137
IB 320-112821/1-A	Method Blank	59	109	100	115	115	107	105	106
IB 320-113509/1-A	Method Blank								122
IB 320-113509/1-A	Method Blank								122
				ent Isotope		covery (Ac	ceptance L	.imits)	
				3C4-PFHp					
ab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)				
20-19030-1	95630	152 *	153 *	126	120				
20-19030-1 - RE	95630								
20-19030-2	95730	136	147	119	114				
20-19030-2 - RE	95730								
			4 - 4 -		100				

TestAmerica Sacramento

151 *

107

106

144

Isotope Dilution Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Matrix: Water

Prep Type: Total/NA

5 6 7

BO2 PFHx SC4 PFD: SC4 SC4 SC4 <th></th> <th></th> <th></th> <th>Perc</th> <th>ent Isotope</th> <th>Dilution Recove</th> <th>ery (Acceptance Limits)</th> <th></th>				Perc	ent Isotope	Dilution Recove	ery (Acceptance Limits)	
320-19030-4 582573 160 * 145 114 114 320-19030-5 671300 137 129 124 107 320-19030-5 - RE 671300 137 129 124 107 320-19030-6 - RE 597517-1 151* 146 116 117 320-19030-6 - RE 597517-1 151* 146 116 117 320-19030-6 - RE 597517-1 130 134 129 124 320-19030-7 515485 137 127 126 105 320-19030-8 521779 130 134 129 124 320-19030-9 597507 116 99 106 85 320-19030-10 593460-2 123 103 105 83 320-19030-11 - RE 593460-1 113 101 99 80 320-19030-12 593460-1 113 101 99 80 320-19030-13 597517-2 112 105 108			BO2 PFHx	3C4 PFOS	3C4-PFHp	3C5 PFPe		
320-19030-5 671300 137 129 124 107 320-19030-5 - RE 671300 151* 146 116 117 320-19030-6 597517-1 151* 146 116 117 320-19030-7 515485 137 127 126 105 320-19030-7 515485 137 134 129 124 320-19030-8 521779 130 134 129 124 320-19030-9 S97507 116 99 106 85 320-19030-9 - RE 597507 116 99 106 85 320-19030-10 593460-2 123 103 105 83 320-19030-11 563555-1 104 97 81 320-19030-12 593460-1 113 101 99 80 320-19030-12 593460-1 113 101 97 81 320-19030-13 S97517-2 112 108 85 320-19030-14 WW-207A 118 110 97 81 320-19030-15	.ab Sample ID (Client Sample ID	(25-150)	(25-150)	(25-150)	. ,		
320-19030-5 - RE 671300 320-19030-6 S97517-1 151* 146 116 117 320-19030-7 - RE S97517-1 137 127 126 105 320-19030-7 - RE S15485 320 1229 124 105 320-19030-8 - RE S21779 130 134 129 124 320-19030-8 - RE S21779 130 134 129 124 320-19030-8 - RE S97507 116 99 106 85 320-19030-9 - RE S97507 123 103 105 83 320-19030-10 S93460-2 123 103 105 83 320-19030-11 S63555-1 104 91 97 81 320-19030-12 S93460-1 113 101 99 80 320-19030-13 S97517-2 105 108 85 320-19030-14 MW-207A 118 110 97 81 320-19030-15 MW-207A 12* 10* 12* 10* 320-19030-15 MW-504 <td< td=""><td>20-19030-4</td><td>582573</td><td>160 *</td><td>145</td><td>114</td><td>114</td><td></td><td></td></td<>	20-19030-4	582573	160 *	145	114	114		
320-19030-6 597517-1 151* 146 116 117 320-19030-6 - RE 597517-1 127 126 105 320-19030-7 - RE 515485 137 127 126 105 320-19030-8 - RE 521779 130 134 129 124 320-19030-8 - RE 521779 130 134 129 124 320-19030-8 - RE 597507 116 99 106 85 320-19030-9 - RE 597507 116 99 106 85 320-19030-10 593460-2 123 103 105 83 320-19030-11 633555-1 104 91 97 81 320-19030-12 593460-1 113 101 99 80 320-19030-12 593460-1 113 101 99 80 320-19030-12 593460-1 113 101 99 80 320-19030-13 S97517-2 12 105 108 85 320-19030-14 MW-207A 118 110 97 81	20-19030-5	371300	137	129	124	107		
320-19030-6 - RE 597517-1 320-19030-7 515485 137 127 126 105 320-19030-7 FRE 515485 127 126 105 320-19030-8 521779 130 134 129 124 320-19030-8 - RE 521779 16 99 106 85 320-19030-9 - RE 597507 116 99 106 85 320-19030-10 - RE 593460-2 123 103 105 83 320-19030-10 - RE 593460-2 23 101 97 81 320-19030-11 - RE 593460-2 23 101 97 81 320-19030-12 - RE 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 133 101 97 81 320-19030-13 - RE 597517-2 112 105 108 85 320-19030-14 - RE MW-207A 118 110 97 81 320-19030-15 MW-504 12* 10* 12* 10* LCS 320-1110561/2-A </td <td>20-19030-5 - RE</td> <td>371300</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	20-19030-5 - RE	371300						
320-19030-7 \$15485 137 127 126 105 320-19030-7 RE 515485 130 134 129 124 320-19030-8 S21779 116 99 106 85 320-19030-9 S97507 116 99 106 85 320-19030-9 RE S97507 123 103 105 83 320-19030-10 S93460-2 123 103 105 83 320-19030-10 RE S93460-2 104 91 97 81 320-19030-11 RE S63555-1 104 91 97 81 320-19030-12 RE S93460-1 113 101 99 80 320-19030-12 RE S93460-1 113 101 99 81 320-19030-13 RE S97517-2 112 105 108 85 320-19030-14 RE MW-207A 118 10 97 81 320-19030-15 RE MW-504 12* 10* 12* 10* 320-19030-15 RE MW-504 12* 104 93	320-19030-6	597517-1	151 *	146	116	117		
320-19030-7 - RE 515485 320-19030-8 521779 130 134 129 124 320-19030-8 - RE 521779 116 99 106 85 320-19030-9 597507 116 99 106 85 320-19030-9 - RE 597507 123 103 105 83 320-19030-10 593460-2 123 103 105 83 320-19030-11 563555-1 104 91 97 81 320-19030-12 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 113 101 97 81 320-19030-13 S97517-2 112 105 108 85 320-19030-14 RE 597517-2 12* 10* 12* 10* 320-19030-15 MW-207A 118 110 97 81 320-19030-15 <td< td=""><td>320-19030-6 - RE</td><td>597517-1</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	320-19030-6 - RE	597517-1						
320-19030-8 521779 130 134 129 124 320-19030-8 - RE 521779 116 99 106 85 320-19030-9 - RE 597507 123 103 105 83 320-19030-10 593460-2 123 103 105 83 320-19030-10 - RE 593460-2 133 105 83 320-19030-11 - RE 593460-2 113 101 99 80 320-19030-12 - RE 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 113 101 99 80 320-19030-13 597517-2 112 105 108 85 320-19030-13 - RE 597517-2 320 320 320 103 136 124 128 320-19030-14 - RE MW-207A 118 110 97 81 320-19030-15 - RE MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 104 93 97 LCS 320-110851/2-A Lab Control	320-19030-7 5	515485	137	127	126	105		
320-19030-8 - RE 521779 320-19030-9 - RE 597507 116 99 106 85 320-19030-9 - RE 597507 123 103 105 83 320-19030-10 593460-2 123 103 105 83 320-19030-10 - RE 593460-2 104 91 97 81 320-19030-11 - RE 563555-1 104 91 97 81 320-19030-12 - S93460-1 113 101 99 80 320-19030-12 - RE 593460-1 113 101 99 80 320-19030-13 - RE 597517-2 112 105 108 85 320-19030-13 - RE 597517-2 112 105 108 85 320-19030-13 - RE 597517-2 112 105 108 85 320-19030-14 MW-207A 118 110 97 81 320-19030-15 MW-504 12* 10* 12* 10* 320-19030-15 MW-504 12* 10 93 97 LCS 320-110851/2-A Lab	20-19030-7 - RE	515485						
320-19030-9 597507 116 99 106 85 320-19030-9 - RE 597507 123 103 105 83 320-19030-10 S93460-2 123 103 105 83 320-19030-10 - RE 593460-2 123 104 91 97 81 320-19030-11 563555-1 104 91 97 81 320-19030-12 593460-1 113 101 99 80 320-19030-12 S93460-1 113 101 99 80 320-19030-12 - RE 593460-1 112 105 108 85 320-19030-13 S97517-2 112 105 108 85 320-19030-14 MW-207A 118 110 97 81 320-19030-15 MW-504 12* 10* 12* 10* 320-19030-15 MW-504 12* 10* 12* 10* 320-19030-15 RE MW-504 12* 104 93 97 LCS 320-110951/2-A Lab Control Sample 102 <t< td=""><td>320-19030-8</td><td>521779</td><td>130</td><td>134</td><td>129</td><td>124</td><td></td><td></td></t<>	320-19030-8	521779	130	134	129	124		
320-19030-9 - RE 597507 320-19030-10 593460-2 123 103 105 83 320-19030-10 - RE 593460-2 104 91 97 81 320-19030-11 - RE 563555-1 104 91 97 81 320-19030-12 - RE 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 112 105 108 85 320-19030-13 597517-2 112 105 108 85 320-19030-14 MW-207A 118 110 97 81 320-19030-15 - RE MW-207A 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 12* 10* S20-110951/2-A Lab Control Sample 139 136 124 128 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 <	320-19030-8 - RE 5	521779						
320-19030-10 593460-2 123 103 105 83 320-19030-10 - RE 593460-2 320-19030-11 563555-1 104 91 97 81 320-19030-11 - RE 563555-1 104 91 97 81 320-19030-12 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 112 105 108 85 320-19030-12 - RE 593460-1 112 105 108 85 320-19030-13 - RE 597517-2 112 105 108 85 320-19030-14 - RE MW-207A 118 110 97 81 320-19030-15 - RE MW-207A 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 12* 10* 320-110951/2-A Lab Control Sample 139 136 124 128 LCS 320-110951/2-A Lab Control Sample 102 104 93 97 LCS 320-111096/2-A Lab Control Sample 102 104 93 129	320-19030-9	597507	116	99	106	85		
320-19030-10 - RE 593460-2 320-19030-11 563555-1 104 91 97 81 320-19030-11 - RE 563555-1 113 101 99 80 320-19030-12 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 112 105 108 85 320-19030-13 - RE 597517-2 112 105 108 85 320-19030-14 - RE MW-207A 118 110 97 81 320-19030-14 - RE MW-207A 18 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 104 93 97 LCS 320-110951/2-A Lab Control Sample 102 104 93 97 LCS 320-110951/2-A Lab Control Sample 102 104 93 97 LCS 320-110951/2-A Lab Control Sample 102 104 93 97	320-19030-9 - RE	597507						
320-19030-11 563555-1 104 91 97 81 320-19030-11 - RE 563555-1 113 101 99 80 320-19030-12 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 320 105 108 85 320-19030-13 597517-2 112 105 108 85 320-19030-14 MW-207A 118 110 97 81 320-19030-14 - RE MW-207A 12* 10* 12* 10* 320-19030-15 MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 93 97 LCS 320-110951/2-A Lab Control Sample 139 136 124 128 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 134 134 123 129 LCS 320-113509/2-A Lab Control Sample D	320-19030-10	593460-2	123	103	105	83		
320-19030-11 - RE 563555-1 320-19030-12 593460-1 320-19030-12 - RE 593460-1 320-19030-13 597517-2 320-19030-13 - RE 597517-2 320-19030-13 - RE 597517-2 320-19030-14 MW-207A 320-19030-14 - RE MW-207A 320-19030-15 MW-504 320-19030-15 - RE MW-504 LCS 320-110951/2-A Lab Control Sample 102 104 93 LCS 320-110951/2-A Lab Control Sample LCS 320-110951/2-A Lab Control Sample LCS 320-110951/2-A Lab Control Sample LCS 320-110951/3-A Lab Control Sample LCS 320-110951/3-A Lab Control Sample Dup LCS 320-110951/3-A Lab Control Sample Dup LCS 320-113509/2-A Lab Control Sample Dup LCSD 320-113509/3-A Lab Control Sample Dup LCSD 320-110951/1-A Method Blank MB 320-110951/1-A Method Blank MB 320-111096/1-A Method Blank MB 320-111096/1-A Method Blank MB 320-111096/1-A Method Blank	320-19030-10 - RE	593460-2						
320-19030-12 593460-1 113 101 99 80 320-19030-12 - RE 593460-1 112 105 108 85 320-19030-13 597517-2 112 105 108 85 320-19030-13 - RE 597517-2 112 105 108 85 320-19030-14 MW-207A 118 110 97 81 320-19030-14 - RE MW-207A 12* 10* 12* 10* 320-19030-15 MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 93 97 LCS 320-110951/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample LCSD 320-110951/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-112821/3-A Lab Control Sample Dup Lab Control Sample Dup LCSD 320-113509/3-A Lab Control Sample Dup MB 320-110951/1-A Method Blank 146 148 136<	320-19030-11	563555-1	104	91	97	81		
320-19030-12 - RE 593460-1 320-19030-13 597517-2 112 105 108 85 320-19030-13 - RE 597517-2 118 110 97 81 320-19030-14 MW-207A 118 110 97 81 320-19030-14 - RE MW-207A 12* 10* 12* 10* 320-19030-15 MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 104 93 97 LCS 320-110951/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-113509/2-A Lab Control Sample 134 134 123 129 LCSD 320-110951/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 134 136 143 MB 320-110951/1-A Method Blank 146 148 136<	320-19030-11 - RE	563555-1						
320-19030-13 597517-2 112 105 108 85 320-19030-13 - RE 597517-2 118 110 97 81 320-19030-14 MW-207A 118 110 97 81 320-19030-14 - RE MW-207A 12* 10* 12* 10* 320-19030-15 MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 104 93 97 LCS 320-110951/2-A Lab Control Sample 102 104 93 97 LCS 320-11096/2-A Lab Control Sample 102 104 93 97 LCS 320-113509/2-A Lab Control Sample 12* 12* 12* LCS 320-113509/2-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104	320-19030-12 !	593460-1	113	101	99	80		
320-19030-13 - RE 597517-2 320-19030-14 MW-207A 118 110 97 81 320-19030-14 - RE MW-207A 12* 10* 12* 10* 320-19030-15 MW-504 12* 10* 12* 10* 320-19030-15 - RE MW-504 12* 10* 12* 12* 12* 12* 12* 12* 12* 12* 12* 12* 12* 12* 12* 12* 12* 12* 12* 10* 12* 10* 12* 10* 12* 10* 12* 10* 12* 10* 12* 10* 12* 10* 12* 10* 12*	320-19030-12 - RE	593460-1						
320-19030-14 MW-207A 118 110 97 81 320-19030-14 - RE MW-207A 12 * 10 * 12 * 10 * 320-19030-15 MW-504 12 * 10 * 12 * 10 * 320-19030-15 - RE MW-504 12 * 10 * 12 * 10 * LCS 320-110951/2-A Lab Control Sample 139 136 124 128 LCS 320-111096/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 134 134 123 129 LCS 320-113509/2-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-11096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 147 112 104	320-19030-13	597517-2	112	105	108	85		
320-19030-14 - RE MW-207A 320-19030-15 MW-504 12 * 10 * 12 * 10 * 320-19030-15 - RE MW-504 139 136 124 128 LCS 320-110951/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-113509/2-A Lab Control Sample 134 134 123 129 LCSD 320-113509/2-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 116 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104	320-19030-13 - RE	597517-2						
320-19030-15 MW-504 12 * 10 * 12 * 10 * 320-19030-15 - RE MW-504 139 136 124 128 LCS 320-110951/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-113509/2-A Lab Control Sample 12 * 134 123 129 LCSD 320-113509/2-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 116 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104	320-19030-14	MW-207A	118	110	97	81		
320-19030-15 - RE MW-504 LCS 320-110951/2-A Lab Control Sample 139 136 124 128 LCS 320-111096/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-113509/2-A Lab Control Sample	320-19030-14 - RE	MW-207A						
LCS 320-110951/2-A Lab Control Sample 139 136 124 128 LCS 320-111096/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-113509/2-A Lab Control Sample 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 147 112 110 104	320-19030-15 ľ	MW-504	12 *	10 *	12 *	10 *		
LCS 320-111096/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 134 134 123 129 LCSD 320-110951/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-112821/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 147 112 110 104	320-19030-15 - RE	MW-504						
LCS 320-111096/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 102 104 93 97 LCS 320-112821/2-A Lab Control Sample 134 134 123 129 LCSD 320-110951/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-112821/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-11096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 147 112 110 104	-CS 320-110951/2-A	Lab Control Sample	139	136	124	128		
LCS 320-112821/2-A Lab Control Sample LCS 320-113509/2-A Lab Control Sample LCSD 320-110951/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-112821/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 147 112 110 104		•	102	104	93	97		
LCS 320-113509/2-A Lab Control Sample LCSD 320-110951/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-112821/3-A Lab Control Sample Dup Lab Control Sample Dup 146 148 136 143 LCSD 320-113509/3-A Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 117 112 110 104 MB 320-111096/1-A Method Blank 147 112 104		•						
LCSD 320-110951/3-A Lab Control Sample Dup 134 134 123 129 LCSD 320-112821/3-A Lab Control Sample Dup Lab Control Sample Dup 134 134 123 129 LCSD 320-113509/3-A Lab Control Sample Dup Lab Control Sample Dup 146 148 136 143 MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 147 142 146 148 146	-CS 320-113509/2-A	Lab Control Sample						
LCSD 320-112821/3-A Lab Control Sample Dup LCSD 320-113509/3-A Lab Control Sample Dup MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 147 112 104		•	134	134	123	129		
LCSD 320-113509/3-A Lab Control Sample Dup MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 117 112 104	CSD 320-112821/3-A	Lab Control Sample Dup						
MB 320-110951/1-A Method Blank 146 148 136 143 MB 320-111096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 117 112 104								
MB 320-111096/1-A Method Blank 117 112 110 104 MB 320-112821/1-A Method Blank 117 112 104 104			146	148	136	143		
MB 320-112821/1-A Method Blank		Method Blank	117	112	110	104		
	/IB 320-112821/1-A	Method Blank						
MB 320-113509/1-A Method Blank	MB 320-113509/1-A	Method Blank						
Surrogate Legend	Surroanto Larand							

13C8 FOSA = 13C8 FOSA 13C4 PFBA = 13C4 PFBA 13C2 PFHxA = 13C2 PFHxA 13C4 PFOA = 13C4 PFOA 13C5 PFNA = 13C5 PFNA 13C2 PFDA = 13C2 PFDA 13C2 PFUnA = 13C2 PFUnA 13C2 PFDoA = 13C2 PFDoA 1802 PFHxS = 1802 PFHxS 13C4 PFOS = 13C4 PFOS 13C4-PFHpA = 13C4-PFHpA 13C5 PFPeA = 13C5 PFPeA

TestAmerica Sacramento

Client Sample ID: Method Blank

Prep Type: Total/NA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-110951/1-A	
Matrix: Water	

Analysis Batch: 113162								Prep Batch:	
		MB							
Analyte		Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Perfl. orob. tanoic aci4 LPF5A6	17/1		270		ng/U			0(/09/1(23:39	1
Perfl. oro) entanoic aci4 LPFPeA6	172d	J	270		ng/U			0(/09/1(23:39	1
Perfl. orohepanoic aci4 LPFHpA6	ND		270		ng/U			0(/09/1(23:39	1
Perfl. orohe) tanoic aci4 LPFH) A6	ND		270		ng/U			0(/09/1(23:39	1
Perfl. orooctanoic aci4 LPFx A6	ND		270		ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orononanoic aci4 LPFNA6	ND		270	07(u	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro4ecanoic aci4 LPFDA6	ND		270	07dd	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro. n4ecanoic aci4 LPF* nA6	ND		270		ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro4o4ecanoic aci4 LPFDoA6	ND		270	07uO	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orotri4ecanoic Aci4 LPFTriA6	ND		270	07uu	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orotetra4ecanoic aci4 LPFTeA6	07(91	J	270	0720	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	ND		270	0712	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro-n-octan4ecanoic aci4 IPFx DA6	ND		270	07(8	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orob. tane S. Ifonate LPF5S6	ND		270	0792	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orohepane S. Ifonate LPFHpS6	ND		270	0708	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	ND		270	0781	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. oro4ecane s. Ifonate LPFDS6	ND		270	172	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orooctane S. Ifonate LPFx S6	ND		270	173	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
Perfl. orooctane S. Ifonami4e LFx SA6	ND		270	07(d	ng/U		0u/23/1(12:30	0(/09/1(23:39	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	29		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C4 PFBA	128		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C2 PFHxA	131		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C4 PFOA	144		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C5 PFNA	139		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C2 PFDA	138		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C2 PFUnA	148		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C2 PFDoA	137		25 - 150				05/23/16 12:30	06/09/16 23:39	1
1802 PFHxS	146		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C4 PFOS	148		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C4-PFHpA	136		25 - 150				05/23/16 12:30	06/09/16 23:39	1
13C5 PFPeA	143		25 - 150				05/23/16 12:30	06/09/16 23:39	1

Lab Sample ID: LCS 320-110951/2-A Matrix: Water Analysis Batch: 113162

Analysis Batch: 113162							Prep Batch: 110951
	Spike	LCS I	LCS				%Rec.
Analyte	Added	Result (Qualifier	Unit	D	%Rec	Limits
Perfl. orob. tanoic aci4 LPF5A6	d070	3179		ng/U			8d - 130
Perfl. oro) entanoic aci4 LPFPeA6	d070	3270		ng/U		02	(9 - 13d
Perfl. orohepanoic aci4 LPFHpA6	d070	3u73		ng/U		∞	80 - 13(
Perfl. orohe) tanoic aci4 LPFH) A6	d070	3u7(ng/U		09	(3 - 13u
Perfl. orooctanoic aci4 LPFx A6	d070	3(73		ng/U		91	(3 - 1d1
Perfl. orononanoic aci4 LPFNA6	d070	3971		ng/U		90	81 - 1d0
Perfl. oro4ecanoic aci4 LPFDA6	d070	3(78		ng/U		92	((_1d1

TestAmerica Sacramento

Prep Type: Total/NA

Client Sample ID: Lab Control Sample

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Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-110951/2-A Matrix: Water			Client Sample ID: Lab Control Sam Prep Type: Total/						
Analysis Batch: 113162	Spike	LCS LCS			Prep Batch: 110951 %Rec.				
Analyte	Added	Result Qualifier	Unit	D %Rec	Limits				
Perfl. oro. n4ecanoic aci4	070b	3(70	ng/U	92	(O- 139				
LPF* nA6 Perfl. oro4o4ecanoic aci4	d070	3u7u	ng/U	09	81 - 139				
LPFDoA6									
Perfl. orotri4ecanoic Aci4 IPFTriA6	d070	3d7d	ng/U	Q	u1 - 139				
Perfl. orotetra4ecanoic aci4 LPFTeA6	070b	2072	ng/U	80	d8 - 130				
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	070b	2u 7 i	ng/U	(3	u0 ₋ 1u0				
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	070b	O73u B	ng/U	21	u0 ₋ 1u0				
Perfl. orob. tane S. Ifonate LPF5S6	3u7d	287u	ng/U	80	uu - 1d8				
Perfl. orohepane S. Ifonate LPFHpS6	3(7d	3978	ng/U	109	uO- 130				
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	3071	3(7u	ng/U	9(32 - 180				
Perfl. oro4ecane s. Ifonate LPFDS6	307(307d	ng/U	89	3u - 1u8				
Perfl. orooctane S. Ifonate IPFx S6	3871	3170	ng/U	Cd	d8 - 1(2				
Perfl. orooctane S. Ifonami4e LFx SA6	d070	3370	ng/U	Qu	u9 - 1(3				

	LCS	LCS	
Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	28		25 - 150
13C4 PFBA	119		25 - 150
13C2 PFHxA	123		25 - 150
13C4 PFOA	126		25 - 150
13C5 PFNA	125		25 - 150
13C2 PFDA	127		25 - 150
13C2 PFUnA	132		25 - 150
13C2 PFDoA	130		25 - 150
18O2 PFHxS	139		25 - 150
13C4 PFOS	136		25 - 150
13C4-PFHpA	124		25 - 150
13C5 PFPeA	128		25 - 150

Lab Sample ID: LCSD 320-110951/3-A Matrix: Water Analysis Batch: 113162

Analysis Batch: 113162							Prep Ba	tch: 11	10951
	Spike	LCSD	LCSD				%Rec.		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfl. orob. tanoic aci4 LPF5A6	d070	3270		ng/U		00	8d - 130	0	30
Perfl. oro) entanoic aci4 LPFPeA6	070b	327u		ng/U		01	(9-13d	1	30
Perfl. orohepanoic aci4 LPFHpA6	070b	3d7(ng/U		α	80 - 13(2	30
Perfl. orohe) tanoic aci4 LPFH) A6	070b	3d70		ng/U		Qu	(3 ₋ 13u	u	30
Perfl. orooctanoic aci4 LPFx A6	070b	3u78		ng/U		C9	(3 ₋ 1d1	2	30
Perfl. orononanoic aci4 LPFNA6	070b	397(ng/U		99	81 - 1d0	1	30
Perfl. oro4ecanoic aci4 LPFDA6	070b	3071		ng/U		9u	((- 1d1	d	30

TestAmerica Sacramento

Prep Type: Total/NA

Client Sample ID: Lab Control Sample Dup

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCSD 320-110951/3-A Matrix: Water			Client S	Sample ID:		trol Sampl Type: To		
Analysis Batch: 113162	Spike	LCSD			Pre %Re	p Batch: 1	10951 RPD	
Analyte	Added		Qualifier Unit	D %R			Limit	- 2
Perfl. oro. n4ecanoic aci4	d070	3u7(ng/U		09 (0-		30	
LPF* nA6								-
Perfl. oro4o4ecanoic aci4	d070	3d7O	ng/U		O8 81 - 1	39 2	30	
LPFDoA6								
Perfl. orotri4ecanoic Aci4 LPFTriA6	070b	3370	ng/U		Qu u1_′	39 2	30	
Perfl. orotetra4ecanoic aci4 IPFTeA6	070b	307d	ng/U		8(d8 - 7	30 O	30	T
Perfl. oro-n-hepa4ecanoic aci4 LPFHpDA6	070b	2072	ng/U		81 u0 ₋ 7	u0 12	30	
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	d070	107u	B ng/U		2(u0 - 2	u0 23	30	
Perfl. orob. tane S. Ifonate LPF5S6	3u7d	237d	ng/U		((uu - ′	d8 1(30	
Perfl. orohepane S. Ifonate LPFHpS6	3(7d	d170	ng/U	1	1u uO- <i>1</i>	30 u	30	
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	3071	3(73	ng/U		9u 32 - 1	80 0	30	
Perfl. oro4ecane s. Ifonate LPFDS6	307(3u7(ng/U		92 3u - 1	lu8 1(30	
Perfl. orooctane S. Ifonate LPFx S6	3871	3370	ng/U		C9 d8 - 7	(2 (30	
Perfl. orooctane S. Ifonami4e LFx SA6	070b	387(ng/U		9d u9 - 1	(3 11	30	

	LCSD	LCSD	
Isotope Dilution	%Recovery	Qualifier	Limits
13C8 FOSA	28		25 - 150
13C4 PFBA	114		25 - 150
13C2 PFHxA	121		25 - 150
13C4 PFOA	131		25 - 150
13C5 PFNA	123		25 - 150
13C2 PFDA	127		25 - 150
13C2 PFUnA	131		25 - 150
13C2 PFDoA	123		25 - 150
1802 PFHxS	134		25 - 150
13C4 PFOS	134		25 - 150
13C4-PFHpA	123		25 - 150
13C5 PFPeA	129		25 - 150

Lab Sample ID: MB 320-111096/1-A Matrix: Water Analysis Batch: 112206

Analysis Batch: 112206							Prep Batch: 1	11096
-	MB MB							
Analyte	Result Qualifi	er RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfl. orob. tanoic aci4 LPF5A6	07u1u J	270	07d(ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro) entanoic aci4 LPFPeA6	ND	270	0799	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orohepanoic aci4 LPFHpA6	ND	270	0789	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orohe) tanoic aci4 LPFH) A6	ND	270	0700	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orooctanoic aci4 LPFx A6	ND	270	078u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orononanoic aci4 LPFNA6	ND	270	07(u	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro4ecanoic aci4 LPFDA6	ND	270	07dd	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1

TestAmerica Sacramento

Client Sample ID: Method Blank

Prep Type: Total/NA

5

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11 12 13

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: MB 320-11109 Matrix: Water	6/1 -A							le ID: Method Prep Type: To	otal/NA
Analysis Batch: 112206								Prep Batch:	111096
		MB				_			
Analyte		Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fac
Perfl. oro. n4ecanoic aci4 LPF* nA6	07013	J	270		ng/U			0(/01/1(1(:20	1
Perfl. oro4o4ecanoic aci4 LPFDoA6	ND		270		ng/U		•	0(/01/1(1(:20	1
Perfl. orotri4ecanoic Aci4 LPFTriA6	ND		270		ng/U			0(/01/1(1(:20	1
Perfl. orotetra4ecanoic aci4 LPFTeA6	07(u0	J	270		ng/U		•	0(/01/1(1(:20	1
Perfl. oro-n-hepa4ecanoic aci4 IPFHpDA6	ND		270	0712	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro-n-octan4ecanoic aci4 LPFx DA6	ND		270	07(8	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orob. tane S. Ifonate LPF5S6	ND		270	0792	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orohepane S. Ifonate LPFHpS6	ND		270	0708	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro-1-he) tanes. Ifonate LPFH) S6	ND		270	0781	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. oro4ecane s. Ifonate LPFDS6	ND		270	172	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orooctane S. Ifonate LPFx S6	ND		270	173	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
Perfl. orooctane S. Ifonami4e LFx SA6	ND		270	07(d	ng/U		0u/2d/1(12:d8	0(/01/1(1(:20	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	39		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C4 PFBA	109		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C2 PFHxA	108		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C4 PFOA	115		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C5 PFNA	115		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C2 PFDA	107		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C2 PFUnA	105		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C2 PFDoA	111		25 - 150				05/24/16 12:47	06/01/16 16:28	1
18O2 PFHxS	117		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C4 PFOS	112		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C4-PFHpA	110		25 - 150				05/24/16 12:47	06/01/16 16:28	1
13C5 PFPeA	104		25 - 150					06/01/16 16:28	1

Lab Sample ID: LCS 320-111096/2-A Matrix: Water

Analysis Batch: 112206

Client Sample ID: Lab Control Sample

Prep Type: Total/NA Prep Batch: 111096

	Spike	LCS L	LCS				%Rec.
Analyte	Added	Result (Qualifier	Unit	D	%Rec	Limits
Perfl. orob. tanoic aci4 LPF5A6	070b	3d7u		ng/U		α	8d - 130
Perfl. oro) entanoic aci4 LPFPeA6	070b	337(ng/U		Cd	(9_13d
Perfl. orohepanoic aci4 LPFHpA6	070b	3u7O		ng/U		C9	80 - 13(
Perfl. orohe) tanoic aci4 LPFH) A6	070b	3u79		ng/U		90	(3 - 13u
Perfl. orooctanoic aci4 LPFx A6	070b	3d71		ng/U		Qu	(3 ₋ 1d1
Perfl. orononanoic aci4 LPFNA6	070b	3(73		ng/U		91	81 - 1d0
Perfl. oro4ecanoic aci4 LPFDA6	070b	3872		ng/U		93	((_1d1
Perfl. oro. n4ecanoic aci4	070b	3d7u		ng/U		α	(O ₋ 139
LPF* nA6 Perfl. oro4o4ecanoic aci4 LPFDoA6	070b	3370		ng/U		Qu	81 - 139
Perfl. orotri4ecanoic Aci4 LPFTriA6	070b	3u79		ng/U		90	u1 _ 139
Perfl. orotetra4ecanoic aci4 LPFTeA6	070b	3079		ng/U		88	d8 - 130

QC Sample Results

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

LPFx DA6

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-1	111096/2-A					Clie	ent Sample ID:		
Matrix: Water								Prep Type: To	
Analysis Batch: 112206								Prep Batch:	111096
			Spike		LCS			%Rec.	
Analyte			Added		Qualifier	Unit	D %Rec	Limits	_
Perfl. oro-n-hepa4ecanoic aci4			d070	2u7d		ng/U	(3	u0 _ 1u0	
LPFHpDA6			4070	/	P	na/!!	10	u0 40	
Perfl. oro-n-octan4ecanoic aci4			d070	(7(0	Ď	ng/U	18	u0 ₋ 1u0	
LPFx DA6 Perfl. orob. tane S. Ifonate			3u7d	2870		ng/U	8(uu ₋ 1d8	
Perfl. orob. tane S. Ifonate			5010	2010			Jo		
Perfl. orohepane S. Ifonate			3(7d	2(70		ng/U	82	uO_ 130	
PFHpS6						-			
Perfl. oro-1-he) tanes. Ifonate			3071	3379		ng/U	C9	32 - 180	
LPFH) S6								0	
Perfl. oro4ecane s. lfonate IPFDS6			307(3172		ng/U	OI	3u - 1u8	
Perfl. orooctane S. Ifonate			3871	3u7O)	ng/U	98	d8 - 1(2	
LPFx S6						-			
Perfl. orooctane S. Ifonami4e			d070	3(78		ng/U	92	u9 - 1(3	
Fx SA6	LCS I	C 9							
sotono Dilution			Limits						
sotope Dilution 13C8 FOSA	42 %Recovery		25 - 150						
13C8 FOSA 13C4 PFBA	42 102		25 - 150 25 - 150						
13C4 PFBA 13C2 PFHxA	102 100		25 - 150 25 - 150						
	100 101		25 - 150 25 - 150						
13C4 PFOA 13C5 PENA									
13C5 PFNA 13C2 PEDA	96 96		25 - 150 25 - 150						
13C2 PFDA	96 95		25 - 150 25 - 150						
13C2 PFUnA	95 80		25 - 150 25 - 150						
13C2 PFDoA	89 102		25 - 150 25 - 150						
1802 PFHxS	102 104		25 - 150 25 - 150						
13C4 PFOS	104		25 - 150 25 - 150						
13C4-PFHpA	93 07		25 - 150 25 - 150						
13C5 PFPeA	97		25 - 150						
Lab Sample ID: MB 320-1 ⁴	12821/1_^						Client Same	ple ID: Method	Blank
Matrix: Water							Sherit Odili	Prep Type: To	
Analysis Batch: 113412								Prep Type: To Prep Batch:	
anaryoro Dateri. 113412		MB MB						י יפי סמונה:	112021
Analyte		ult Qualifier	RI		MDL Unit		D Prepared	Analyzed	Dil Fac
Perfl. oro-n-octan4ecanoic aci4 PFx DA6		G(3 J	27		07(8 ng/U			0(/11/1(22:18	1
	,	NB MB							
sotope Dilution	%Recove	ery Qualifier		_			Prepared	Analyzed	Dil Fac
13C2 PFDoA	1	06	25 - 150				06/07/16 11:40	06/11/16 22:17	1
	140004/0_5								
Lab Sample ID: LCS 320-1	112821/2-A					Clie	ent Sample ID:		
Matrix: Water								Prep Type: To	
Analysis Batch: 113412			0-11-		1.00			Prep Batch:	112821
A mali 4-			Spike		LCS	11. 11	B 417	%Rec.	
Analyte			Added	Result	Qualifier	Unit	D %Rec	Limits	

Client: Shannon & Wilson			Samp					Tes	stAmeric	a Job ID: 3	320-190	030-1
roject/Site: City of Fairbank		ng Area <i>LCS</i>										
Isotope Dilution	%Recovery	Qualifier	Limits									
13C2 PFDoA	98		25 - 150									
Lab Sample ID: LCSD 320 Matrix: Water)-112821/3-A	L.				(Client Sa	mple	ID: Lab	Control S Prep Typ	e: Tota	al/NA
Analysis Batch: 113412			Spike		LCSD	LCSD				Prep Bat %Rec.	tch: 11	12821 RPD
Analyte			Added		Result	Qualifier		D		Limits	RPD	Limit
Perfl. oro-n-octan4ecanoic aci4 IPFx DA6			d070		uu70	В	ng/U		130	u0 ₋ 1u0	ud	30
	LCSD	LCSD										
Isotope Dilution	%Recovery	Qualifier	Limits									
13C2 PFDoA	104		25 - 150									
Lab Sample ID: MB 320-1 ⁴	13509/1-A							Clie	ent Sam	ple ID: Me		
Matrix: Water										Prep Type		
Analysis Batch: 113942		MB MB								Prep Bat	tch: 11	3509
Analyte	Re	esult Qualifier		RL		MDL Unit	г	D Pi	repared	Analyze	ed [Dil Fac
Perfl. oro-n-octan4ecanoic aci4		ND	-	270		07(8 ng/U		0(/1	3/1(09:uC	0 0(/1(/1(0	8b:80	1
LPFx DA6												
	<i>01</i> D = = = =	MB MB	Linci					-		1		511 5
Isotope Dilution	%Keco	overy Qualifier							Prepared	Analyze		Dil Fac
13C2 PFDoA		122	25 - 1	50				06/1	3/16 09:50	0 06/16/16 0)7:47	1
Lab Sample ID: LCS 320-1	113509/2-A						Clier	nt Sar	mple ID:	: Lab Cont		
Matrix: Water										Prep Type		
Analysis Batch: 113942										Prep Bat	tch: 11	13509
			Spike			LCS				%Rec.		
Analyte			Added			Qualifier		D	%Rec	Limits		
Perfl. oro-n-octan4ecanoic aci4 IPFx DA6			d070		d873		ng/U		110	u0 ₋ 1u0		
		LCS										
Isotope Dilution	%Recovery	Qualifier	Limits									
	115		25 - 150									
13C2 PFDoA									ID: Lab	Control S	Sample	e Dup
		1					Client Sa	mple				
Lab Sample ID: LCSD 320		٨				(Client Sa	mple				al/NA
Lab Sample ID: LCSD 320 Matrix: Water		Υ.				(Client Sa	mple		Prep Type	e: Tota	
Lab Sample ID: LCSD 320 Matrix: Water		L	Spike		LCSD	LCSD	Client Sa	mple	ID. Lab		e: Tota	
Lab Sample ID: LCSD 320 Matrix: Water Analysis Batch: 113942		L	Spike Added					-	%Rec	Prep Type Prep Bat	e: Tota	13509
Lab Sample ID: LCSD 320 Matrix: Water Analysis Batch: 113942 Analyte						LCSD		-		Prep Type Prep Bat %Rec.	e: Tota tch: 11	13509 RPD
13C2 PFDoA Lab Sample ID: LCSD 320 Matrix: Water Analysis Batch: 113942 Analyte Perfl. oro-n-octan4ecanoic aci4 IPFx DA6			Added		Result	LCSD	Unit	-	%Rec	Prep Type Prep Bat %Rec. Limits	e: Tota tch: 11 RPD	I 3509 RPD Limit
Lab Sample ID: LCSD 320 Matrix: Water Analysis Batch: 113942 Analyte Perfl. oro-n-octan4ecanoic aci4)-113509/3-A		Added		Result	LCSD	Unit	-	%Rec	Prep Type Prep Bat %Rec. Limits	e: Tota tch: 11 RPD	I 3509 RPD Limit
Lab Sample ID: LCSD 320 Matrix: Water Analysis Batch: 113942 Analyte Perfl. oro-n-octan4ecanoic aci4)-113509/3-A	LCSD	Added		Result	LCSD	Unit	-	%Rec	Prep Type Prep Bat %Rec. Limits	e: Tota tch: 11 RPD	I 3509 RPD Limit

QC Association Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

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Prep Batch: 110951

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1	95630	Total/NA	Water	3535	
320-19030-2	95730	Total/NA	Water	3535	
320-19030-3	471542	Total/NA	Water	3535	
320-19030-4	582573	Total/NA	Water	3535	
320-19030-5	671300	Total/NA	Water	3535	
320-19030-6	597517-1	Total/NA	Water	3535	
320-19030-7	515485	Total/NA	Water	3535	
320-19030-8	521779	Total/NA	Water	3535	
LCS 320-110951/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-110951/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-110951/1-A	Method Blank	Total/NA	Water	3535	

Lab Sample ID **Client Sample ID** Prep Type Matrix Method **Prep Batch** 320-19030-9 3535 597507 Total/NA Water 320-19030-10 593460-2 Total/NA Water 3535 Total/NA 320-19030-11 563555-1 Water 3535 13 320-19030-12 593460-1 Total/NA Water 3535 320-19030-13 597517-2 Total/NA Water 3535 320-19030-14 MW-207A Total/NA Water 3535 Total/NA 3535 320-19030-15 MW-504 Water LCS 320-111096/2-A Lab Control Sample Total/NA Water 3535 Total/NA 3535 MB 320-111096/1-A Method Blank Water

Analysis Batch: 112206

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-9	597507	Total/NA	Water	WS-LC-0025	111096
320-19030-10	593460-2	Total/NA	Water	WS-LC-0025	111096
320-19030-11	563555-1	Total/NA	Water	WS-LC-0025	111096
320-19030-12	593460-1	Total/NA	Water	WS-LC-0025	111096
320-19030-13	597517-2	Total/NA	Water	WS-LC-0025	111096
320-19030-14	MW-207A	Total/NA	Water	WS-LC-0025	111096
320-19030-15	MW-504	Total/NA	Water	WS-LC-0025	111096
LCS 320-111096/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	111096
MB 320-111096/1-A	Method Blank	Total/NA	Water	WS-LC-0025	111096

Prep Batch: 112821

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-9 - RE	597507	Total/NA	Water	3535	
320-19030-10 - RE	593460-2	Total/NA	Water	3535	
320-19030-11 - RE	563555-1	Total/NA	Water	3535	
320-19030-12 - RE	593460-1	Total/NA	Water	3535	
320-19030-13 - RE	597517-2	Total/NA	Water	3535	
320-19030-14 - RE	MW-207A	Total/NA	Water	3535	
320-19030-15 - RE	MW-504	Total/NA	Water	3535	
LCS 320-112821/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-112821/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-112821/1-A	Method Blank	Total/NA	Water	3535	

QC Association Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

LCMS (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1	95630	Total/NA	Water	WS-LC-0025	11095
320-19030-2	95730	Total/NA	Water	WS-LC-0025	11095 ⁻
320-19030-3	471542	Total/NA	Water	WS-LC-0025	110951
320-19030-4	582573	Total/NA	Water	WS-LC-0025	11095 ⁻
320-19030-5	671300	Total/NA	Water	WS-LC-0025	11095
320-19030-6	597517-1	Total/NA	Water	WS-LC-0025	11095 ⁻
320-19030-7	515485	Total/NA	Water	WS-LC-0025	11095
320-19030-8	521779	Total/NA	Water	WS-LC-0025	11095
_CS 320-110951/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	11095
_CSD 320-110951/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	11095
MB 320-110951/1-A	Method Blank	Total/NA	Water	WS-LC-0025	11095
nalysis Batch: 1134	12				
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
320-19030-9 - RE	597507	Total/NA	Water	WS-LC-0025	11282
320-19030-10 - RE	593460-2	Total/NA	Water	WS-LC-0025	11282
_CS 320-112821/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	11282
_CSD 320-112821/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	11282
MB 320-112821/1-A	Method Blank	Total/NA	Water	WS-LC-0025	11282
rep Batch: 113509					
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1 - RE	95630	Total/NA	Water	3535	
320-19030-2 - RE	95730	Total/NA	Water	3535	
320-19030-3 - RE	471542	Total/NA	Water	3535	
320-19030-5 - RE	671300	Total/NA	Water	3535	
320-19030-6 - RE	597517-1	Total/NA	Water	3535	
320-19030-7 - RE	515485	Total/NA	Water	3535	
320-19030-8 - RE	521779	Total/NA	Water	3535	
LCS 320-113509/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-113509/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-113509/1-A	Method Blank	Total/NA	Water	3535	
nalysis Batch: 1135	59				
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-11 - RE	563555-1	Total/NA	Water	WS-LC-0025	11282
320-19030-12 - RE	593460-1	Total/NA	Water	WS-LC-0025	11282
320-19030-13 - RE	597517-2	Total/NA	Water	WS-LC-0025	11282
320-19030-14 - RE	MW-207A	Total/NA	Water	WS-LC-0025	11282
320-19030-15 - RE	MW-504	Total/NA	Water	WS-LC-0025	11282
nalysis Batch: 1139	42				
_ab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1 - RE	95630	Total/NA	Water	WS-LC-0025	113509

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19030-1 - RE	95630	Total/NA	Water	WS-LC-0025	113509
320-19030-2 - RE	95730	Total/NA	Water	WS-LC-0025	113509
320-19030-3 - RE	471542	Total/NA	Water	WS-LC-0025	113509
320-19030-5 - RE	671300	Total/NA	Water	WS-LC-0025	113509
320-19030-6 - RE	597517-1	Total/NA	Water	WS-LC-0025	113509
320-19030-7 - RE	515485	Total/NA	Water	WS-LC-0025	113509
320-19030-8 - RE	521779	Total/NA	Water	WS-LC-0025	113509
LCS 320-113509/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	113509

TestAmerica Sacramento

QC Association Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

LCMS (Continued)

Analysis	Batch:	113942	(Continued)
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Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 320-113509/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	113509
MB 320-113509/1-A	Method Blank	Total/NA	Water	WS-LC-0025	113509

TestAmerica Sacramento

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Lab Sample ID: 302-48232-4

Lab Sample ID: 302-48232-0

Matrix: Water

Matrix: Water

Client Sample ID: 87132 Date Collected: 27/41/41 42:61 Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			534.9 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	534.9 mL	1.0 mL	113162	06/10/16 00:42	JRB	TAL SAC
Total/NA	Prep	3535	RE		515.8 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	515.8 mL	1.0 mL	113942	06/16/16 08:51	JRB	TAL SAG

Client Sample ID: 87N32 Date Collected: 27/41/41 42:72 Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			557.8 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	557.8 mL	1.0 mL	113162	06/10/16 01:04	JRB	TAL SAC
Total/NA	Prep	3535	RE		530.2 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	530.2 mL	1.0 mL	113942	06/16/16 09:12	JRB	TAL SAC

Client Sample ID: 6N4760 Date Collected: 27/41/41 44:36 Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			567.1 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	567.1 mL	1.0 mL	113162	06/10/16 01:25	JRB	TAL SAC
Total/NA	Prep	3535	RE		518.6 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	518.6 mL	1.0 mL	113942	06/16/16 09:34	JRB	TAL SAC

Client Sample ID: 7907N3 Date Collected: 27/41/41 40:64 Date Received: 27/02/41 28:62

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch F s mber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			551.6 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	551.6 mL	1.0 mL	113162	06/10/16 01:46	JRB	TAL SAC

Client Sample ID: 1N4322 Date Collected: 27/41/41 46:06 Date Received: 27/02/41 28:62

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	yatch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			561 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	561 mL	1.0 mL	113162	06/10/16 02:07	JRB	TAL SAC
Total/NA	Prep	3535	RE		542.2 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	542.2 mL	1.0 mL	113942	06/16/16 10:16	JRB	TAL SAC

TestAmerica Sacramento

Lab Sample ID: 302-48232-3 Matrix: Water

Lab Sample ID: 302-48232-6

Lab Sample ID: 302-48232-7

atrix: water

Matrix: Water

Matrix: Water

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Lab Sample ID: 302-48232-1

Lab Sample ID: 302-48232-N

Matrix: Water

Matrix: Water

Client Sample ID: 78N74N-4

Date Collected: 27/41/41 41:04 Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			550.1 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	550.1 mL	1.0 mL	113162	06/10/16 02:29	JRB	TAL SAC
Total/NA	Prep	3535	RE		562.3 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	562.3 mL	1.0 mL	113942	06/16/16 11:41	JRB	TAL SAC

Client Sample ID: 747697 Date Collected: 27/41/41 4N:42 Date Received: 27/02/41 28:62

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch F s mber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535		_	554.8 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	554.8 mL	1.0 mL	113162	06/10/16 02:50	JRB	TAL SAC
Total/NA	Prep	3535	RE		543.9 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	543.9 mL	1.0 mL	113942	06/16/16 12:03	JRB	TAL SAC

Client Sample ID: 704NN8 Date Collected: 27/41/41 47:42 Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			553.5 mL	1.0 mL	110951	05/23/16 12:30	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553.5 mL	1.0 mL	113162	06/10/16 04:15	JRB	TAL SAC
Total/NA	Prep	3535	RE		558.9 mL	1.0 mL	113509	06/13/16 09:50	EW1	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	558.9 mL	1.0 mL	113942	06/16/16 12:24	JRB	TAL SAC

Client Sample ID: 78N72N Date Collected: 27/4N41 44:71 Date Received: 27/02/41 28:62

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			553.8 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553.8 mL	1.0 mL	112206	06/02/16 20:40	JRB	TAL SAC
Total/NA	Prep	3535	RE		534.5 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	534.5 mL	1.0 mL	113412	06/12/16 12:28	JRB	TAL SAC

Client Sample ID: 783612-0 Date Collected: 27/4N41 46:20 Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			560.6 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	560.6 mL	1.0 mL	112206	06/02/16 21:01	JRB	TAL SAC
Total/NA	Prep	3535	RE		526.5 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC

TestAmerica Sacramento

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Lab Sample ID: 302-48232-9 Matrix: Water

Lab Sample ID: 302-48232-8 Matrix: Water

Lab Sample ID: 302-48232-42

Matrix: Water

Lab Chronicle

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

Lab Sample ID: 302-48232-42

Lab Sample ID: 302-48232-44

Client Sample ID: 783612-0 Date Collected: 27/4N41 46:20

Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Analysis	WS-LC-0025	RE	1	526.5 mL	1.0 mL	113412	06/12/16 12:49	JRB	TAL SAC

Client Sample ID: 713777-4 Date Collected: 27/4N41 47:63 Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			553.4 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	553.4 mL	1.0 mL	112206	06/02/16 21:22	JRB	TAL SAC
Total/NA	Prep	3535	RE		531.7 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	531.7 mL	1.0 mL	113559	06/12/16 14:15	JRB	TAL SAC

Client Sample ID: 783612-4 Date Collected: 27/4N41 41:6N Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535	_	_	545.8 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	545.8 mL	1.0 mL	112206	06/02/16 22:47	JRB	TAL SAC
Total/NA	Prep	3535	RE		524.5 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	524.5 mL	1.0 mL	113559	06/12/16 14:36	JRB	TAL SAC

Client Sample ID: 78N74N-0 Date Collected: 27/4N41 44:47 Date Received: 27/02/41 28:62

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	z inal Pmosnt	y atch Fsmber	Brepared or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			558.9 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	558.9 mL	1.0 mL	112206	06/02/16 23:09	JRB	TAL SAC
Total/NA	Prep	3535	RE		535.7 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	535.7 mL	1.0 mL	113559	06/12/16 14:57	JRB	TAL SAC

Client Sample ID: MW-02NP Date Collected: 27/4N41 46:0N Date Received: 27/02/41 28:62

Brep 5Tpe	y atch 5Tpe	y atch Method	Rsn	Dil zactor	Initial Pmosnt	zinal Pmosnt	y atch F s mber	Brepared or PnalTued	PnalTAt	Lab
Total/NA Total/NA	Prep Analysis	3535 WS-LC-0025		1	573.7 mL 573.7 mL	1.0 mL 1.0 mL	111096 112206	05/24/16 12:47 06/02/16 23:30	VPM JRB	TAL SAC TAL SAC
Total/NA Total/NA	Prep Analysis	3535 WS-LC-0025	RE RE	1	524.8 mL 524.8 mL	1.0 mL 1.0 mL	112821 113559	06/07/16 11:40 06/12/16 15:18	•••••	TAL SAC TAL SAC

Matrix: Water

Matrix: Water

5 10 13

Lab Sample ID: 302-48232-40

Lab Sample ID: 302-48232-43

Lab Sample ID: 302-48232-46

Matrix: Water

Matrix: Water

Matrix: Water

TestAmerica Sacramento

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

Matrix: Water

Lab Sample ID: 302-48232-47

Client Sample ID: MW-726 Date Collected: 27/4N41 47:63 Date Received: 27/02/41 28:62

	y atch	y atch		Dil	Initial	zinal	y atch	Brepared		
Brep 5Tpe	5Tpe	Method	Rsn	zactor	Pmosnt	Pmosnt	Fsmber	or PnalTued	PnalTAt	Lab
Total/NA	Prep	3535			564.2 mL	1.0 mL	111096	05/24/16 12:47	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	564.2 mL	1.0 mL	112206	06/02/16 23:51	JRB	TAL SAC
Total/NA	Prep	3535	RE		520.5 mL	1.0 mL	112821	06/07/16 11:40	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025	RE	1	520.5 mL	1.0 mL	113559	06/12/16 15:40	JRB	TAL SAC

LaboratorT ReferenceA:

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

TestAmerica Sacramento

Certification Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Training Area

TestAmerica Job ID: 320-19030-1

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Alaska (UST)	State Program	10	UST-055	12-18-16
Arizona	State Program	9	AZ0708	08-11-16
Arkansas DEQ	State Program	6	88-0691	06-17-17
California	State Program	9	2897	01-31-17
Colorado	State Program	8	CA00044	08-31-16
Connecticut	State Program	1	PH-0691	06-30-17
Florida	NELAP	4	E87570	06-30-17
Hawaii	State Program	9	N/A	01-31-17
Illinois	NELAP	5	200060	03-17-17
Kansas	NELAP	7	E-10375	07-31-16
Louisiana	NELAP	6	30612	06-30-17
Maine	State Program	1	CA0004	04-18-18
Michigan	State Program	5	9947	01-31-18
Nevada	State Program	9	CA00044	07-31-16
New Jersey	NELAP	2	CA005	06-30-16
New York	NELAP	2	11666	04-01-17
Oregon	NELAP	10	4040	01-29-17
Pennsylvania	NELAP	3	68-01272	03-31-17
Texas	NELAP	6	T104704399	07-31-17
US Fish & Wildlife	Federal		LE148388-0	10-31-16
USDA	Federal		P330-11-00436	12-30-17
USEPA UCMR	Federal	1	CA00044	11-06-16
Utah	NELAP	8	CA00044	02-28-17
Virginia	NELAP	3	460278	03-14-17
Washington	State Program	10	C581	05-05-17
West Virginia (DW)	State Program	3	9930C	12-31-16
Wyoming	State Program	8	8TMS-L	01-29-17

Method Summary

Client: Shannon & Wilson Project/Site: City of Fairbanks Fire Train

Project/Site: City of Fairbanks Fire Training Area

12 13 14

Method	Method Description Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons TAL SOP	TAL SAC
Protocol Re	ferences:	
TAL SOP	P = TestAmerica Laboratories, Standard Operating Procedure	
TAL SOP	P = TestAmerica Laboratories, Standard Operating Procedure	
	P = TestAmerica Laboratories, Standard Operating Procedure References:	

TestAmerica Sacramento

		T (A : D 000 (0			
Vilson Fairbanks Fire Training Area		TestAmerica Job ID: 320-19030-1			
Client Sample ID	Matrix	Collected Rece	ived		
95630	Water	05/16/16 10:46 05/20/1	6 09:40		
95730	Water	05/16/16 10:50 05/20/1	6 09:40		
471542	Water	05/16/16 11:34 05/20/1	6 09:40		
582573	Water	05/16/16 12:41 05/20/1	6 09:40		
671300	Water	05/16/16 14:24 05/20/1	6 09:40		
597517-1	Water	05/16/16 16:21 05/20/1	6 09:40		
515485	Water	05/16/16 17:10 05/20/1	5 09:40		
521779	Water	05/16/16 15:10 05/20/1	6 09:40		
597507	Water	05/17/16 11:56 05/20/1	6 09:40		
593460-2	Water	05/17/16 14:02 05/20/1	6 09:40		
563555-1	Water	05/17/16 15:43 05/20/1	6 09:40		
593460-1	Water	05/17/16 16:47 05/20/1	6 09:40		
597517-2	Water	05/17/16 11:15 05/20/1	6 09: <mark>4</mark> 0		
MW-207A	Water	05/17/16 14:27 05/20/1	6 09:40		
MW-504	Water	05/17/16 15:43 05/20/1	6 09:40		
	Client Sample ID 95630 95730 471542 582573 671300 597517-1 515485 521779 597507 593460-2 563555-1 593460-1 597517-2 MW-207A	Client Sample ID Matrix 95630 Water 95730 Water 471542 Water 582573 Water 671300 Water 597517-1 Water 515485 Water 597507 Water 593460-2 Water 593460-1 Water 593460-1 Water 597517-2 Water MW-207A Water	Client Sample ID Matrix Collected Rece 95630 Water 05/16/16 10:46 05/20/10 95730 Water 05/16/16 10:50 05/20/10 471542 Water 05/16/16 11:34 05/20/10 582573 Water 05/16/16 12:41 05/20/10 671300 Water 05/16/16 14:24 05/20/10 597517-1 Water 05/16/16 16:21 05/20/10 515485 Water 05/16/16 16:21 05/20/10 521779 Water 05/16/16 15:10 05/20/10 593460-2 Water 05/17/16 11:56 05/20/10 593460-1 Water 05/17/16 15:43 05/20/10 597517-2 Water 05/17/16 16:47 05/20/10 593460-1 Water 05/17/16 15:43 05/20/10 597517-2 Water 05/17/16 16:47 05/20/10 597517-2 Water 05/17/16 11:15 05/20/10 597507A Water 05/17/16 11:15 05/20/10 593460-1 <t< td=""></t<>		

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TestAmerica Sacramento



320-19030 Chain of Custody

320-19030 Chain of Custody					
Geotechnical and Environmental Consultants	CHAIN	-OF-CUSTODY RE	Labora	atory Test America David Allfrider	
400 N 34th Street, Suite 100 2043 Westport Center Drive Seattle, WA 98103 St Louis, MO 63146-3564 (206) 632-8020 (314) 699-9660	2705 Saint Andrews Lo Pasco, WA 99301-3378 (509) 946-6309		Attn:		
4955 Hill Road 5430 Fairbanks Street, Suite 3 Fairbanks, AK 99709 Anchorage, AK 99518 \$071 479-0609 (907) 561-2120 \$075 600 Control of the second		5.5	(Include preservative in debut)		
2255 S W. Canyon Road 1321 Bannock Street, Suite 20 Porlland, OR 97201-2498 Denver, CO 80204 503) 223-6147 (303) 825-3800 Sample Identity Lab No.	u Date Time Sample			ACT Remarks/Matrix	
95630	1046 5/16/1	6 K K		2 Water	
95730	1050	MX I		2	
471542	1134	P K		2	
582573	1241	AX		2	
671300	1424	1 X X		2	
597517-1	1621	V X		2	
515485	1710 0	19K		2	
521779	1510 +	XX		2	
597507	1156 5/17/1	64X		2	
593460-2	1402 1	XX		2 +	
Project Information Sam	ple Receipt	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	
Project Number: 31-1-11735-005 Total Number		Signature Jodo Time 1000	Signature: Time:	Signature Time	
Project Name. Rog Fire Train Cart COC Seals/In Contact MDN/JAK Received God		Printed Name Date. 5/8/6	Printed Name Date	Printed Name Date	
Dingoing Project? Yes No Delivery Meth	nod: FedEX	Marcy Naill	Company	Company.	
Sampler: MDN/SWH (attach shipping		Shannon & Wilson			
Instructions		- Received By: 1.	Received By: 2.	Received By: 3.	
Requested Turnaround Time Std		Signature. Trme: 0940	Signature Time	Signature	
Special Instructions: Please notificantly annual of ship	ment	Printed Name, Date 5 20116 Connor M. Edman	Printed Name. Date.	Printed Name Date	
Distribution White - w/shipment - returned to Shannon & V Yellow - w/shipment - for consignee files Pink - Shannon & Wilson - Job File	Vilson w/ laboratory report	Company.	Company.	Company [,]	

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206) 633-8020 (314) 699-9	ort Center Drive 2705 Saint An O 63146-3564 Pasco, WA 99 660 (509) 946-630 nks Street, Suite 3 AK 99518	drews Loop, Suit 301-3378		JSTOD		vsis Parameter	La Att s/Sample Containu preservative if use	n:A	Page 2 of Test America wid Atlincher
Portland, OR 97201-2498 Denver, CO (503) 223-6147 (303) 825-36 Sample Identity	Lab No. Time	Date Sampled	COLL CIS	A A	ÿ/ 			100	
563555-1	1513 -	117/16	X	×				2	Water
593460-1	1647		X	X	_	_		2	
-597517-2	1115			×				2	
MW-207A MW-504	1427		X	×				22	
Project Information	Sample Receipt			uished By:			uished By:		Relinquished By: 3
Project Number [.] Project Name [.] Contact.	Total Number of Containers COC Seals/Intact? Y/H7NA Received Good Cond /Cold	Printe	d Name	Date.5 Nadel	ISTIC	Signature Printed Name	Time Date		ted Name Date
Ongoing Project? Yes No	Delivery Method	Comp	bany.	onto Wil	m	Company			npany.
Quastru	ictions				1		ed By: 2		Received By: 3
Requested Turnaround ime:		Signa	iture.	7.6 Tme. 6	140	Signature	Time:	Sigr	nature Time
Special Instructions		Co	d Name	M.R.J.Mar	Trollo	Printed Name.	Date [,]		red Name Date
Distribution White - w/shipment - returne Yellow - w/shipment - for co Pink - Shannon & Wilson - Jo		y report	bañy'			Company.		Con	npany

14

No. 33842

Client: Shannon & Wilson

Login Number: 19030 List Number: 1 Creator: Nelson, Kym D

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

Job Number: 320-19030-1

List Source: TestAmerica Sacramento

Laboratory Data Review Checklist

Completed by: Erica Blake
Title:GeologistDate:June 24, 2016
CS Report Name: City of Fairbanks Fire Training Area Report Date: June 23, 2016
Consultant Firm: Shannon & Wilson, Inc.
Laboratory Name: TestAmerica, Inc. Laboratory Report Number: 320-19030
ADEC File Number: 102.38.182 ADEC RecKey Number:
 Laboratory Laboratory a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? Yes No XNA (Please explain.) Comments: The ADEC has not approved any analytical laboratory for perfluorinated compound (PFC) analysis.
 b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved? Yes No NA (Please explain.)
Analyses were performed by TestAmerica, Inc. in Folsom, California.
 2. <u>Chain of Custody (COC)</u> a. COC information completed, signed, and dated (including released/received by)? ∑Yes □ No □NA (Please explain.) Comments:
b. Correct analyses requested? Yes No NA (Please explain.) Comments:
 3. Laboratory Sample Receipt Documentation a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)? ∑Yes □ No □NA (Please explain.) Comments: The temperature blank or cooler was measured within the acceptable temperature range of 0 °C to 6 °C upon receipt at the laboratory, as specified in the EPA publication SW-846. This range has
been approved by ADEC.

ł	b. Sample preservation acceptable – acidified waters, Me Volatile Chlorinated Solvents, etc.)?	ethanol preserved VOC soil (GRO, BTEX,
	\square Yes \square No \square NA (Please explain.)	Comments:
	Analysis of PFCs does not require a preservative other the	han temperature control.
С	e. Sample condition documented – broken, leaking (Meth Yes INO INA (Please explain.)	hanol), zero headspace (VOC vials)? Comments:
[The sample-receipt form notes that the samples were rec	evived in good condition.
Ċ	 If there were any discrepancies, were they documented containers/preservation, sample temperature outside of samples, etc.? Yes No XNA (Please explain.) 	1
[There were no discrepancies reported by the laboratory.	
e	. Data quality or usability affected? (Please explain.)	Comments:
[The laboratory did not note any affect on data quality or	usability.
	 Narrative Present and understandable? ∑Yes ☐ No ☐NA (Please explain.) 	Comments:
t	 Discrepancies, errors or QC failures identified by the l	ab? Comments:
	Isotope Dilution Analyte (IDA) recoveries were outside for several project samples. Refer to the Case Narrative f	
	The laboratory control sample (LCS) and/or LCS duplic 111096 and 112821 had low recoveries for perfluoro-n-o	
	Sample 582573 (320-19030-4) was re-extracted in prep sample wasn't spiked with the IDA compounds so it can't octandecanoic acid (PFODA). The sample was used up in extraction isn't possible. The original results are reported	t be quantified for perfluoro-n- n the re-extraction so a second re-
	Insufficient sample volume was available to perform a n (MS/MSD) associated with analytical batches 320-11095 volume was available to perform an MS/MSD/sample du	51, 320-112821. Insufficient sample
	The extract for all samples were orange or yellow in colo and MW-504 (320-19030-15) were received with some k	

4.

	d. What is the effect on data quality/usability according to the case narrative? Comments:
	The laboratory does not specify any effect on the data quality or usability. Refer to Section 6.b for LCS/LCSD recovery failures and Section 6.c for IDA recovery failures.
<u>Sa</u>	<u>mples Results</u> a. Correct analyses performed/reported as requested on COC? ∑Yes ☐ No ☐NA (Please explain.) Comments:
	b. All applicable holding times met? ☐Yes ⊠ No ☐NA (Please explain.) Comments:
	Samples were re-extracted out of hold time to confirm the initial results for PFODA due to LCS and LCSD recovery failures. The original results were used for reporting purposes and are not affected by the hold time exceedance.
	c. All soils reported on a dry weight basis? Yes No XNA (Please explain.) Comments:
	Soil samples were not submitted with this work order.
	d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for project?
	$ Yes \square No \square NA (Please explain.) $ Comments:
	The PQLs, equivalent to the TestAmerica Reporting Limit (RL), are less than the applicable EPA provisional drinking-water health advisory levels and the ADEC proposed groundwater-cleanup levels for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).
	e. Data quality or usability affected? Comments:

Page 3 of 9

The LCS and LCSD recovery failures for PFODA required re-extraction of the project samples to

Comments:

1/10

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, ana	lysis and 20 samples?
⊠Yes □ No □NA (Please explain.)	Comments:

Comments:

PFC analytes were detected in the method blanks (MBs) at estimated concentrations less than their reporting limits (RL) but greater than the method detection limit (MDL). The analytes are: perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), perfluorotetradecanoic acid (PFTeA), perfluoroundecanoic acid (PFUnA), and perfluoron-octandecanoic (PFODA).

iii. If above PQL, what samples are affected?

Comments:

Project samples in the same preparatory batch are affected by the method blank detection if they have reported detections within ten times the method blank detection.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined? Xes No NA (Please explain.) Comments:

The PFBA concentrations detected in project sample 515485, 593460-2, 593460-1, 597517-2, and MW-207A are considered estimated results (biased high) and are flagged 'JH*' in the analytical results table.

The PFBA concentrations detected in project samples 95630, 95730, 471542, 582573, 671300, 597517-1, 521779, and 597507 are considered not detected due to the method blank detection and are flagged 'B*' at either the reported sample result or the reporting limit, whichever is higher.

The PFPeA concentrations detected in project samples 671300, 597517-1, and 515485 are considered estimated results (biased high) and are flagged 'JH*' in the analytical results table.

The PFPeA concentrations detected in project samples 95630, 95730, 471542, 582573, and 521779 are considered not detected due to the method blank detection and flagged 'B*' at either the reported sample result or the reporting limit, whichever is higher.

The PFTeA concentrations detected in all project samples are considered not detected and are flagged 'B*' at either the reported sample result or the reporting limit, whichever is higher.

The PFUnA concentrations detected in project samples 597507, 593460-2 and 593460-1 are considered not detected and are flagged 'B*' at either the reported sample result or the reporting limit, whichever is higher.

PFODA results from the re-extraction are associated with the method blank detection for PFODA. We are only reporting the original results and consider the method blank detections for PFODA to not affect the original sample results.

v. Data quality or usability affected? (Please explain.)

Comments:

Comments:

Yes; see above.

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

LCS/LCSD sample results were reported. Sufficient volume was not available to obtain MS/MSD samples. However, the LCS/LCSD samples are sufficient to assess accuracy and precision.

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

Yes No NA (Please explain.)

Metals and inorganics were not analyzed as part of 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 ∑ No □NA (Please explain.) Comments:

LCS and LCSD samples for prep batch 110951 and 111096 had low percent recoveries for PFODA.

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 X No NA (Please explain.)

The LCS/LCSD RPD for PFODA in prep batch 112821 was outside accetpance criteria.

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

All reported project sample results for PFODA are affected by the LCS and LCSD recovery failures.

The results for prep batch 112821 were not used for reporting purposes. The project samples are not affected by the RPD failure.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined? Xes No NA (Please explain.) Comments:

Project sample results for PFODA are considered estimated, biased low due to the LCS and LCSD recovery failures. Project samples results with detections for PFODA are flagged "JL*" and samples with non-detect results are flagged "J*" to note the inaccuracy of the QC failure.

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

Comments:

Yes; see above.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples? [Yes] No] NA (Please explain.) Comments:

The analytical method WS-LC-0025 uses Isotope Dilution Analyte (IDA) recovery, which entails adding a 13C-isotope or 18O-isotope for target analyte and assessing the recovery of each analyte. The isotopically labeled compounds are the surrogates for this method.

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

The project sample MW-504 had recovery failures for all IDAs.

The IDA recovery for 13C2 perfluorododecanoic acid (PFDoA) was outside QC criteria for project sample 563555-1. The analyte PFDoA is associated with the IDA recovery failure.

The IDA recovery for 13C2 perfluoroundecanoic acid (PFUnA) was outside QC criteria for project sample 515485. The analytes PFUnA, PFTriA, and PFTeA are associated with the IDA recovery failure.

The IDA recovery for 13C4 perfluorodecane sulfonate (PFOS) was outside QC criteria for project samples 95630 and 471542. The analytes PFDS and PFOS are associated with IDA recovery failure.

The IDA recovery for 13C8 perfluorooctane sulfonamide (FOSA) was outside QC criteria for project samples 471542, 582573, 593460-2, 593460-1, and MW-270A. The analyte PFOSA is associated with the IDA recovery failure.

The IDA recovery for 18O2 perfluorohexane sulfonate (PFHxS) was outside QC criteria for project samples 95630, 582573, and 597517-1. The analytes PFBS and PFHxS are associated with the IDA recovery failure.

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

 \bigvee Yes \square No \square NA (Please explain.)

Comments:

The analytical results associated with the IDA recovery failures are considered estimated (no bias) and are flagged "J*" in the analytical tables.

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

Comments:

Ves	see	above.	
100.	SUU	abbvc.	

- 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.) nents:

Yes No No NA (Please explain.)	Comn
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PFCs are not volatile compounds, so a trip blank is not required.

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

No trip blank is required; see above.

iii. All results less than POL? \square Yes \square No \square NA (Please explain.)

Comments:

No trip blank is required; see above.

iv. If above PQL, what samples are affected?

Comments:

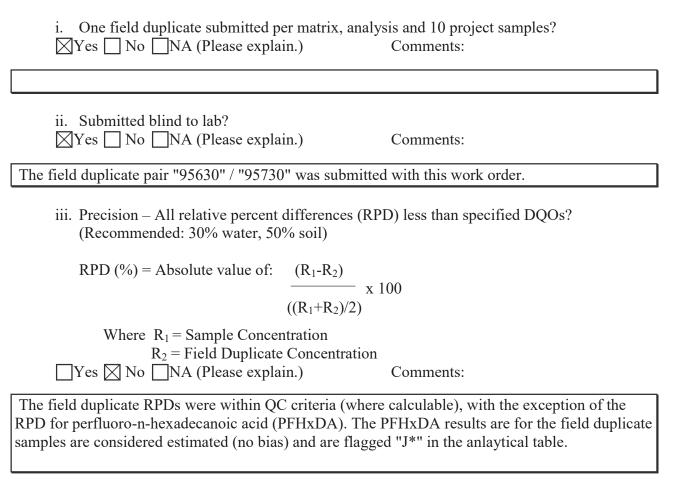
No trip blank is required; see above.

v. Data quality or usability affected? (Please explain.)

Comments:

The data quality and usability were not affected.

e. Field Duplicate



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

Comments:

Yes; see above.

f. Decontamination or Equipment Blank (If not used explain why).

	\Box Yes \Box No \Box NA (Please explain.)	Comments:			
	Reusable equipment was not used in sample collection for not required.				
	i. All results less than PQL?				
	$\Box Y es \Box No \Box NA (Please explain.)$	Comments:			
	N/A; an equipment blank was not required.				
	ii. If above PQL, what samples are affected?				
		Comments:			
	N/A; an equipment blank was not required.				
	iii. Data quality or usability affected? (Please explain.)				
		Comments:			
	The data quality and usability were not affected.				
7. <u>Otł</u>	Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.) a. Defined and appropriate?				
	Yes No NA (Please explain.)	Comments:			

APPENDIX E

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT



Attachment to and part of Report: 31-1-11735-005

Date: August 2016

 To:
 Mr. Jackson Fox, City of Fairbanks

 Re:
 February to May 2016 Private Well Sampling

 Summary Report, City of Fairbanks Regional

 Fire Training Center, Fairbanks, Alaska

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

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

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

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

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

SUBSURFACE CONDITIONS CAN CHANGE.

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

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

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

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

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

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

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

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

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

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

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

READ RESPONSIBILITY CLAUSES CLOSELY.

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

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