# Ohakea: Surface Water and Groundwater Monitoring for PFAS March 2021

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Dear Kate and Stephen

## OHAKEA: SURFACE WATER AND GROUNDWATER MONITORING FOR PFAS, MARCH 2021

### 1.0 Introduction

Monitoring for per- and polyfluoroalkyl substances (PFAS) concentrations in groundwater and surface water was conducted between 15 and 19 March 2021 in accordance with the RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (LTMP) (PDP, 2020a). This is the second round of monitoring to be conducted following the implementation of the LTMP (PDP, 2020a). The previous monitoring round, undertaken in October 2020, is reported in PDP (2020b).

The objectives of monitoring are to:

- Track the concentrations of PFAS in surface water and groundwater at representative locations over time to enable stakeholders to monitor plume development; and,
- Support validation of the groundwater model produced by PDP (2019).

The scope of work included:

- The collection of groundwater samples from 19 groundwater wells or taps;
- The collection of surface water from 4 locations;
- The collection of 11 quality assurance/quality control (QA/QC) samples; and
- Preparation of this report.

This letter reports the results of all monitoring undertaken at RNZAF Base Ohakea ("Ohakea" or the "base") at these sample locations, including a comparison with the findings of the first round of monitoring as part of the LTMP (PDP, 2020b).

# 2.0 Methodology

## 2.1 Monitoring Well Installation

In agreement with New Zealand Defence Force (NZDF) and Horizons Regional Council (HRC), the LTMP proposed a total of nine new monitoring wells to be installed to investigate the potential future extent of the PFAS plume extending from the base and to validate the groundwater model predictions (for further information on these bores please refer the LTMP (PDP, 2020a)).

During July 2020, four of the nine monitoring wells were drilled. These were reported on in the October 2020 monitoring report (PDP, 2020b). The remaining five wells (comprised of two 'nested' well locations) were installed in January and February 2021. Five boreholes were drilled at two locations, GW111 and GW112, to depths ranging from 10 m to 90 m below ground level (bgl) to install shallow and deep groundwater monitoring wells (GW111.1, GW111.2, GW111.3, GW112.1 and GW112.2). Core logs from the drilling are provided in Appendix A, refer to Figure 1 for their location.

## 2.2 Sampling Methodology

Sampling was undertaken by PDP field staff between 15 and 19 March 2021. Sampling was undertaken in accordance with procedures in Sampling and Analysis of Per- and Poly-fluorinated Substances (MfE, 2018).

All samples were couriered to AsureQuality laboratory under chain of custody documentation following collection. All samples were analysed by AsureQuality for a suite of PFAS compounds. Copies of the laboratory reports and chain of custody documentation are provided in Appendix B.

The groundwater monitoring locations are described in Table 1, and the surface water monitoring locations are described in Table 2. Refer to Figure 1 for the monitoring locations.

| Table 1: Groundwater Monitoring Locations | | | |
|---|---|---|---|
| **Location** | | **Rationale** | **Sampled** |
| RNZAF Base Ohakea | MW4 | Key source area (historic fire training area (FTA)) | 19/03/21 |
| | WS1 | Downgradient of FTA and near site boundary with a long existing monitoring record | 17/03/21 |
| | GW6 | Downgradient of key source areas and historically elevated PFAS concentrations | 16/03/21 |
| | MW6 | Key source area (run-up pit) | 17/03/21 |
| | MW9 | Key source area (diversion tank for hangar deluge systems) | 18/03/21 |
| | WS2 | North western plume edge (base drinking water supply) | 18/03/21 |
| | GW111.1 | Downgradient of FTA. | 17/03/21 |
| | GW111.2 | Downgradient of FTA. Deeper (~40 m) well to monitor the vertical extent of PFAS. | 17/03/21 |
| | GW111.3 | Downgradient of FTA. Deeper well (~95 m) to monitor the vertical extent of PFAS, targeting the deeper aquifer resource that may be used for groundwater abstraction. | 17/03/21 |
| Other (non-NZDF) private and public land | GW67 | North eastern plume edge | 16/03/21 |
| | GW31 | Eastern plume edge | 16/03/21 |
| | GW53 | Eastern plume edge | 16/03/21 |
| | GW65 | Southern plume edge | 15/03/21 |
| | GW106 | Plume is predicted to approach and then encompass the proposed shallow well into the future. | 16/03/21 |
| | GW107 | Act as a sentinel monitoring location e.g., to monitor the predicted maximum lateral edge of the future plume. | Not sampled |
| | GW108 | Plume is predicted to approach and then encompass the proposed shallow well into the future. | 15/03/21 |
| | GW109 | Plume is predicted to approach and then encompass the proposed shallow well into the future. | 15/03/21 |
| | GW112.1 | Well near the centre of the main plume. | 18/03/21 |
| | GW112.2 | Well near the centre of the main plume. Deeper well (~55 m) to monitor the vertical extent of PFAS. | 18/03/21 |

| Table 2: Surface Water Monitoring Locations | | |
|---|---|---|
| **Location** | **Rationale** | **Sampled** |
| SW6 | Previous high PFAS concentrations leaving the base | Not sampled |
| SW33 | Resurgence of high PFAS concentrations on the Makowhai Stream downstream of the base. Accessible from the road. | 16/03/21 |
| SW36 | Makowhai Stream just upstream from confluence with the Rangitikei River. To determine the maximum extent of PFAS in the Makowhai. | 16/03/21 |
| SW4 | Upstream location to determine if PFAS is present in the Makowhai before entering the base boundary. | 18/03/21 |

## 2.3 Variations from the Monitoring Plan

Samples were not able to be collected from GW107 and SW6 during the March 2021 monitoring round. GW107 is located within the road berm, field personnel had safety concerns regarding the speed, and prevalence of large trucks passing by. Although a traffic management plan was in place for this sampling, in future monitoring rounds, a third party will be engaged to set up additional traffic controls at this location (for example lane closure).

At SW6, dry conditions in the lead up to sampling meant there was no water in the stream/drain where the sample was to be collected from.

## 2.4 Field Measurements

### 2.4.1 Water Level Measurement

A summary of the groundwater level measurements recorded in the monitoring wells as part of the groundwater sampling programme is presented in Appendix C.

### 2.4.2 Field Parameters

Using a YSI ProDSS multi-meter, and in accordance with MfE (2018), field measurements were recorded for the following stabilisation criteria: electrical conductivity, pH, dissolved oxygen, oxidation reduction potential, temperature and turbidity. Prior to use, the ProDSS was calibrated for pH and electrical conductivity and checked throughout the monitoring round. Field sheets for each sample location are presented in Appendix D.

## 2.5 Antecedent Weather Conditions and Flow Conditions

The preceding two weeks had a cumulative rainfall of 44 mm, with no rain falling in the few days leading up to sampling. The Rangitikei River and surrounding streams where surface water samples were collected were low and clear during the sampling round. Sample location SW6 was dry at the time of sampling. SW4 was able to be collected, however the stream was not flowing with pools being disconnected. This meant the sample had to be collected from a stagnant pool.

## 2.6 Quality Assurance Sampling

As part of the sampling programme, the following QA/QC samples were collected:

- Two duplicate samples;
- Two equipment rinsate blanks. One for the surface water sampling equipment (mighty gripper) and one for the groundwater monitoring equipment (water level dipper);

- Two field blank samples; and
- Five trip blank samples.

All QA/QC samples were collected in accordance with the methodology outlined in MfE (2018). All analysis of the QA/QC samples was undertaken by AsureQuality Laboratory in Wellington. The results of QA/QC sampling are reported in Appendix E and further discussed in Section 3.3.

## 3.0 Sample Results and Comparison with Selected Guideline Values

The sample analytical results are presented in the attached Tables 3 and 4 with sample locations shown in Figure 1.

### 3.1 Selected Guideline Values

Table 5 below shows the reference guideline values against which the results have been compared.

**Table 5: Environmental and Human Health Guidelines – Water**

| Media | Sum of Total PFOS + PFHxS | PFOA | Total PFHxS | Total PFOS | Source |
|---|---|---|---|---|---|
| Drinking Water | 0.07 µg/L | 0.56 µg/L | - | - | MoH[1] AGDoH[2] |
| Ecological Freshwater Guideline 90% ecosystem protection | - | 632 µg/L | - | 2 µg/L | HEPA[3] |
| Ecological Freshwater Guideline 95% ecosystem protection | - | 220 µg/L | - | 0.13 µg/L | HEPA[3] |
| Ecological Freshwater Guideline – 99% ecosystem protection | - | 19 µg/L | - | 0.00023 µg/L | HEPA[3,4] |

*Notes:*

1. *Ministry of Health (MoH, 2021) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.*
2. *Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.*
3. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan Version 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.*
4. *The 99% ecosystem protection guideline has been shown for completeness. However, this guideline has not been compared to in the results.*

### 3.2 Sample Results and Comparison to Guideline Values

The analysis and discussion of sample results relates to concentrations of Total PFOS, Total PFHxS and the sum of Total PFOS and PFHxS. When discussed as a collective, these will herein be referred to as 'the core PFAS compounds'.

#### 3.2.1 Groundwater Monitoring Wells

The results of the laboratory analyses for PFAS in groundwater samples, including all results from previous sampling, are presented in Table 3.

For the March 2021 monitoring round a total of 18 groundwater samples were collected. The analytical results are summarised as follows:

- The Sum of Total PFOS and PFHxS was reported above the MOH interim drinking water guideline value (DWG) of 0.07 µg/L at seven locations. These include: GW31 (0.16 µg/L), MW9 (2 µg/L), MW4 (1.9 µg/L), WS1 (0.19 µg/L), MW6 (4.7 µg/L), GW111.1 (0.17 µg/L) and GW112.2 (0.73 µg/L). None of these wells are currently used for drinking water supply.
- Concentrations of Total PFOS exceeded the ANZECC ecological guideline value of 0.13 µg/L for the protection of 95% of freshwater species (95% EGV) at four locations. These include: MW4 (1.4 µg/L), MW9 (1 µg/L), MW6 (2.9 µg/L) and GW112.2 (0.38 µg/L).
- The concentration of Total PFOS in MW9 (2.9 µg/L) also exceeded the ANZECC ecological guideline value of 2 µg/L for the protection of 90% of freshwater species (90% EGV).
- The core PFAS compounds were detected at concentrations above the laboratory limit of reporting (LOR) but below the relevant guideline values at two locations (GW6 and WS2).
- The core PFAS compounds were not reported (i.e., below the laboratory LOR) at nine locations (GW53, GW65, GW67, GW106, GW108, GW109, GW111.2, GW111.3 and GW112.1).

#### 3.2.2 Surface Water

The results of the laboratory analysis for PFAS in the surface water samples, including the results from previous sampling, are presented in Table 4.

For the March 2021 monitoring round 3 surface water samples were collected. The analytical results are summarised as follows:

- The core PFAS compounds were detected at concentrations above the laboratory limit of reporting (LOR) but below the relevant guideline values at all locations.

### 3.3 Quality Assurance/Quality Control Programme

In order to determine the precision of the sampling and laboratory analysis, the similarity between the laboratory duplicates and blind field duplicate samples was quantified by calculating the Relative Percent Difference (%RPD) for each individual parameter detected in both the primary and duplicate samples. It is important to recognise that the results are from the laboratory analysis of chemicals that are present at very low concentrations and as such, the variation in the results may be attributed in part to the analytical method rather than sample collection methodology. The results of the QA/QC assessment are presented in Appendix E, and a summary is provided below.

- %RPDs for blind field duplicates ranged from 0 to 27% meaning all PFAS compounds were below the acceptable %RPD of 30% in the two duplicate samples taken during the March 2021 monitoring round.
- No PFAS compounds were detected above the laboratory LOR in the field blank samples or the equipment rinsate blanks.
- The results of QA/QC assessment meet the data quality objectives for the sampling programme.

# 4.0 Discussion

## 4.1 Groundwater

In general, PFAS concentrations for the March 2021 monitoring round are within the historical ranges previously recorded at these locations.

### 4.1.1 On-base Monitoring Locations

With respect to previous monitoring at and downgradient of key PFAS source areas:

- MW6 recorded the lowest concentrations of the core PFAS compounds in the March 2021 monitoring round when compared to previous monitoring rounds.
- At MW9, concentrations of the core PFAS compounds decreased by an order of magnitude during 2018 and remained that way until the current monitoring round where concentrations have returned to levels similar to those seen in 2017.
- At WS1, WS2, GW6 and MW4, concentrations of the core PFAS compounds remain within their historical ranges.
- This was the first monitoring round at GW111.1, GW111.2 and GW111.3. PFAS was only recorded in the shallow well GW111.1. Sum of Total PFOS and PFHxS in GW111.1 (0.17 µg/L) was similar to the concentration recorded in the upgradient well WS1 ( 0.19 µg/L).

### 4.1.2 Off-base Monitoring Locations

Wells GW31, GW112.1 and GW112.2 are located within the main plume approximately 1 km downgradient of the base:

- At GW31 (screened from 6.5 to 8.0 m deep) the core PFAS compounds remain within their historical ranges, with the Sum of Total PFOS and PFHxS exceeding the DWG.
- This was the first monitoring round at GW112.1 and GW112.2.
  - PFAS was not reported in the shallow well GW112.1 (screened from 3.5 to 9.5 m bgl). This result was not expected; based on the PFAS groundwater model, predictions for the Sum of Total PFOS and PFHxS at this location and depth were ~0.8 µg/L to 1.4 µg/L.
  - The sample from the deeper well GW112.2 (screened from 51.28 to 54.28 m bgl) reported a concentration of the Sum of Total PFOS and PFHxS of 0.73 µg/L. This magnitude of detection was not expected at this depth, particularly given the result from the shallow system borehole.
  - It is not presently clear what is causing the vertical difference in observed results at GW112.1 and GW112.2.

Wells GW106, GW108, GW109 have been installed downgradient of the main plume to monitor plume migration. The plume is predicted to approach and then encompass these wells into the future.

- None of the core PFAS compounds have been detected in any monitoring rounds to date.
- This was the first monitoring round at GW106.

Wells GW53, GW65, GW67 and GW107 are sampled to monitor lateral plume extent:

- At GW53, GW65 and GW107 no PFAS has been detected in any monitoring rounds to date.
- At GW67, the core PFAS compounds remain below the laboratory LOR.

A comparison of the sampling results to the PFAS groundwater model (PDP, 2019) developed for the area continues to show relatively good agreement (refer to Appendix F). In particular, the results agreed with the model prediction for GW106 (no PFAS detected) and GW111 (PFAS present in the shallow aquifer but not the deeper aquifers). At GW112, PFAS was predicted by the model to be similar to GW111 (i.e., PFAS present in the shallow aquifer but not the deeper aquifer), however the results show the opposite, with PFAS detected in the deeper aquifer but not the shallow aquifer. The reason for this is currently unknown.

### 4.2 Surface Water

At SW33, concentrations of the core PFAS compounds have fluctuated over more than two orders of magnitude, with elevated concentrations detected in February 2018 and September 2018, and lower concentrations detected in May 2018 and September 2020. Concentrations were elevated again during the March 2021 monitoring round and are comparable to the concentrations recorded in February 2018 and September 2018.

During the March 2021 monitoring round, samples from SW4 and SW36 reported concentrations of the core PFAS compounds above the laboratory LOR but below the relevant guideline values. This is the first time the core PFAS compounds have been recorded at these locations. As noted in Section 2.5, due to the dry conditions, there was no flowing water at sample location SW4 and the sample was collected from a pool of standing water. With respect to SW36, it is noted that the laboratory LORs for the sample collected in October 2020 are an order of magnitude greater than those for the March 2021 monitoring round, and in many cases the March 2021 results are below the LOR for the October 2020 results.

SW6 was unable to be collected during the March 2021 monitoring round (due to dry conditions). The last two monitoring rounds in July 2018 and October 2020 were an order of magnitude lower than the earlier two monitoring rounds (August and November 2017).

Although this was the first time PFAS has been reported in samples from SW4 and SW36, the PFAS groundwater model (PDP, 2019) did predict that low levels of PFAS could be present in these locations, therefore, the results from the March 2021 surface water sampling are generally in agreement with those predicted by the PFAS groundwater model.

## 5.0 Summary and Recommendations

Monitoring for per- and poly-fluoroalkyl substances (PFAS) in groundwater and surface water was conducted between 15 and 19 March 2021 in accordance with the RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (PDP, 2020a). Eighteen groundwater and three surface water samples were collected from locations on, and adjacent to the base. In summary:

- PFAS has been detected at levels above the guideline values in seven groundwater samples collected during the March 2021 monitoring round:
  - Two off-base groundwater samples exceed the MOH interim drinking water guideline (these groundwater wells are not currently being used for drinking water supply), and the ANZECC ecological guideline value for the protection of freshwater species at the 95% level.
  - Five on-base groundwater samples exceed the MOH interim drinking water guidelines (none of the wells are used for drinking water supply), and the ANZECC ecological guideline value for the protection of freshwater species at the 95% level. One of these samples also exceeds the ANZECC guideline value for 90% species protection.

A comparison of the March 2021 monitoring results with those from previous monitoring rounds shows the current concentrations are generally within the historic ranges recorded for these locations. The exceptions are SW4 and SW36, where the core PFAS compounds were detected for the first time in March 2021, and MW6, where concentration of the core PFAS compounds are significantly lower than previous monitoring rounds.

The surface water and groundwater results from the March 2021 monitoring round are in relatively good agreement with the PFAS groundwater model predictions (PDP, 2019a). The results agreed with the model prediction for GW106 (no PFAS detected) and GW111 (PFAS present in the shallow aquifer but not the deeper aquifers). The exceptions to this agreement are the samples collected from GW112.1 and GW112.2. Based on the model, the shallow sample (GW112.1) is predicted to contain PFAS, and the deep sample (GW112.2) is predicted to not contain PFAS. However, the results from the March 2021 monitoring round showed PFAS present in the deeper sample and not present in the shallow sample. Results of future monitoring rounds (as prescribed by the LTMP) may help to explain these unexpected results.

Two samples (GW107 and SW6) could not be collected due to health and safety concerns surrounding traffic at the monitoring location (GW107) and the stream/drain being dry (SW6).

Due to the results from nested well GW112, the following is recommended:

- Undertake the September 2021 sampling as per the LTMP.
- During the September sampling round, install pressure transducer loggers in all five of the nested wells (GW111.1, GW111.2, GW111.3, GW112.1 and GW112.2). These loggers should be set to continuously record groundwater pressures (levels) in the monitoring wells. This will help in determining vertical hydraulic gradients and how these may be influencing PFAS results.
- Have duplicate samples from GW112.1 and GW112.2 analysed at a second laboratory.
- Undertake a review of the current LTMP after assessing the September 2021 results.

## 6.0 References

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Yours faithfully

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**Table 3: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]**

| Sample Location | MW9 | MW9 | MW9 | MW9 | MW9 | MW9 | MW4 | MW4 | MW4 | MW4 | MW4 | MW4 | Interim Guidance Level for Drinking Water, MoH 2021 [2, 3] | ANZECC 90% Species Protection - Technical Draft Default Guideline Values [4] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values [4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_DTK_MW9_1_200417 | OHA_DTK_MW9_2_311017 | OHA_DTK_MW9_3_200218 | OHA_DTK_MW9_4_040718 | OHA_DTK_MW9_5_300920 | OHA_DTK_MW9_6_180321 | OHA_FTA_MW4_1_090715 | OHA_FTA_MW4_2_010817 | OHA_FTA_MW4_3_311017 | OHA_FTA_MW4_4_050718 | OHA_FTA_MW4_5_300920 | OHA_FTA_MW4_6_190321 | | | |
| **Monitoring Zone** | On base | On base | On base | On base | On base | On base | On base | On base | On base | On base | On base | On base | | | |
| **Laboratory Reference** | 1327497 | 937355 | 1055089 | 1186581 | 2132127 | 2314824 | ES1526105 | 841470 | 937355 | 1186580 | 2132127 | 2314824 | | | |
| **Sample Date** | 20/04/2017 | 31/10/2017 | 20/02/2018 | 4/07/2018 | 30/09/2020 | 18/03/2021 | 9/07/2015 | 1/08/2017 | 31/10/2017 | 5/07/2018 | 30/09/2020 | 19/03/2021 | | | |
| PFPeS | 0.019 | 0.018 | 0.031 | 0.0091 | <0.025 | <0.025 | - | 0.0072 | 0.011 | 0.011 | <0.025 | <0.025 | - | - | - |
| PFBS | 0.12 | 0.072 | 0.093 | 0.028 | 0.034 | 0.064 | 0.05 | 0.032 | 0.043 | 0.034 | 0.025 | 0.034 | - | - | - |
| PFPeS | 0.16 | 0.11 | 0.14 | 0.043 | 0.038 | 0.069 | - | 0.022 | 0.065 | 0.051 | 0.029 | 0.046 | - | - | - |
| di-PFHxS | 0.003 | 0.0025 | 0.003 | <0.001 | <0.025 | <0.025 | - | <0.001 | 0.0017 | 0.0011 | <0.025 | <0.025 | - | - | - |
| Mono-PFHxS | 0.21 | 0.16 | 0.26 | 0.058 | 0.071 | 0.14 | - | 0.1 | 0.14 | 0.081 | 0.061 | 0.083 | - | - | - |
| L-PFHxS | 1.5 | 1.1 | 1.3 | 0.42 | 0.47 | 0.91 | - | 0.54 | 0.76 | 0.49 | 0.35 | 0.46 | - | - | - |
| Total PFHxS | 1.7 | 1.3 | 1.6 | 0.48 | 0.54 | 1 | 1.35 | 0.64 | 0.9 | 0.57 | 0.41 | 0.54 | - | - | - |
| PFHpS | 0.072 | 0.06 | 0.071 | 0.021 | <0.025 | 0.034 | - | 0.032 | 0.059 | 0.032 | <0.025 | <0.025 | - | - | - |
| di-PFOS | 0.055 | 0.057 | 0.078 | 0.013 | <0.025 | 0.045 | - | 0.025 | 0.066 | 0.027 | <0.025 | 0.029 | - | - | - |
| Mono-PFOS | 0.62 | 0.46 | 0.72 | 0.18 | 0.19 | 0.52 | - | 0.45 | 1.1 | 0.5 | 0.33 | 0.46 | - | - | - |
| L-PFOS | 0.52 | 0.31 | 0.58 | 0.19 | 0.24 | 0.46 | - | 1 | 2.1 | 1 | 0.69 | 0.91 | - | - | - |
| Total PFOS | 1.2 | 0.83 | 1.4 | 0.38 | 0.43 | 1 | **3.02** | 1.5 | **3.3** | 1.5 | 1 | 1.4 | - | 2 | 0.13 |
| Sum of PFHxS and PFOS | 2.9 | 2.13 | 3 | 0.86 | 0.97 | 2 | 4.37 | 2.14 | 4.2 | 2.1 | 1.4 | 1.9 | 0.07 | - | - |
| PFNS | <0.001 | <0.005 | <0.005 | <0.001 | <0.05 | <0.05 | - | <0.005 | <0.005 | - | <0.05 | <0.05 | - | - | - |
| PFDS | <0.001 | - | <0.005 | <0.001 | <0.1 | <0.1 | <0.02 | <0.005 | - | <0.001 | <0.1 | <0.1 | - | - | - |
| PFECHS | - | - | - | - | - | <0.025 | - | - | - | - | - | <0.025 | - | - | - |
| PFBA | 0.69 | 0.57 | 0.54 | 0.45 | 0.57 | 0.51 | - | 0.21 | 0.29 | 0.2 | 0.17 | 0.17 | - | - | - |
| PFPeA | 3.5 | 2.9 | 2.6 | 1.7 | 2.1 | 2.3 | - | 1 | 1.7 | 1 | 0.65 | 0.79 | - | - | - |
| PFHxA | 1.8 | 1.5 | 1.5 | 0.92 | 1 | 1.3 | 2.09 | 0.99 | 0.96 | 0.74 | 0.41 | 0.51 | - | - | - |
| PFHpA | 1 | 0.57 | 0.68 | 0.44 | 0.43 | 0.56 | 0.71 | 0.34 | 0.43 | 0.32 | 0.22 | 0.26 | - | - | - |
| PFOA | 0.67 | 0.52 | 0.67 | 0.36 | 0.33 | 0.48 | 0.54 | 0.26 | 0.48 | 0.3 | 0.19 | 0.25 | 0.56 | 632 | 220 |
| PFNA | 0.36 | 0.34 | 0.41 | 0.23 | 0.13 | 0.26 | 0.32 | 0.16 | 0.35 | 0.18 | 0.1 | 0.13 | - | - | - |
| PFDA | 0.0014 | <0.001 | <0.001 | 0.0011 | <0.025 | <0.025 | <0.02 | 0.0021 | 0.0053 | 0.0048 | <0.025 | <0.025 | - | - | - |
| PFUnDA | - | <0.001 | <0.005 | <0.001 | <0.025 | <0.025 | <0.05 | <0.005 | 0.003 | - | <0.025 | <0.025 | - | - | - |
| PFTrDA | - | - | - | <0.025 | <0.1 | <0.1 | <0.05 | - | - | - | <0.1 | <0.1 | - | - | - |
| PFTeDA | - | - | - | <0.1 | <0.1 | <0.1 | <0.5 | - | - | - | <0.1 | <0.1 | - | - | - |
| PFDoDA | - | <0.001 | - | <0.025 | <0.1 | <0.1 | <0.05 | <0.005 | <0.001 | - | <0.1 | <0.1 | - | - | - |
| PFOSA | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.025 | <0.02 | <0.001 | 0.0032 | 0.004 | <0.025 | <0.025 | - | - | - |
| NMeFOSA-M | - | <0.005 | - | <0.005 | <0.1 | <0.1 | <0.5 | <0.005 | <0.005 | - | <0.1 | <0.1 | - | - | - |
| NMeFOSAA | - | <0.005 | <0.005 | <0.001 | <0.025 | <0.025 | - | <0.005 | <0.005 | - | <0.025 | <0.025 | - | - | - |
| NEtFOSAA | - | <0.005 | <0.005 | <0.001 | <0.025 | <0.025 | - | <0.005 | <0.005 | - | <0.025 | <0.025 | - | - | - |
| 4:2 FTS | 0.012 | 0.0095 | 0.011 | 0.004 | <0.025 | <0.025 | - | <0.005 | 0.0054 | 0.0031 | <0.025 | <0.025 | - | - | - |
| 6:2 FTS | 1.9 | 3.6 | 1.7 | 1.5 | 1.1 | 3.2 | 5.6 | 0.88 | 1.6 | 0.86 | 0.45 | 0.45 | - | - | - |
| 8:2 FTS | 0.0035 | <0.005 | <0.005 | 0.0022 | <0.1 | <0.1 | <0.1 | 0.036 | 0.077 | 0.066 | <0.1 | <0.1 | - | - | - |
| 10:2 FTS | - | - | - | - | - | <0.025 | - | - | - | - | - | <0.025 | - | - | - |
| FFrPA | - | - | - | - | - | <0.1 | - | - | - | - | - | <0.1 | - | - | - |
| NMeFOSE | - | <0.005 | <0.025 | <0.005 | <0.1 | <0.1 | <0.5 | <0.005 | <0.005 | - | <0.1 | <0.1 | - | - | - |
| NEtFOSA-M | - | <0.005 | - | <0.005 | <0.1 | <0.1 | <0.05 | <0.005 | <0.005 | - | <0.1 | <0.1 | - | - | - |
| NEtFOSE-M | - | <0.005 | <0.025 | <0.005 | <0.1 | <0.1 | <0.5 | <0.005 | <0.005 | - | <0.1 | <0.1 | - | - | - |
| FPePA | - | - | - | - | - | <0.025 | - | - | - | - | - | <0.025 | - | - | - |
| FHpPA | - | - | - | - | - | <0.025 | - | - | - | - | - | <0.025 | - | - | - |

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 0.3 | Concentration exceeds 95% ecological guidelines. |
| **1.2** | Concentration exceeds 90% ecological guidelines. |
| 3.6 | Concentration exceeds interim drinking water guidelines |

**Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS)** [1]

| Sample Location | GW106 | GW107 | GW108 | GW108 | GW109 | GW109 | GW111 | GW111 | GW111 | GW111 | GW112 | GW112 | Interim Guidance Level for Drinking Water, MoH 2017 [2, 3] | ANZECC 90% Species Protection - Technical Draft Default Guideline Values [4] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values [4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_ADJ_GW106_1_160321 | OHA_ADJ_GW107_1_011020 | OHA_ADJ_GW108_1_011020 | OHA_ADJ_GW108_2_150321 | OHA_ADJ_GW109_1_011020 | OHA_ADJ_GW109_2_150321 | OHA_BAI_GW111.1_1_170321 | OHA_BAI_GW111.2_1_040221 | OHA_BAI_GW111.2_2_170321 | OHA_BAI_GW111.3_1_170321 | OHA_ADJ_GW112.1_1_180321 | OHA_ADJ_GW112.2_1_180321 | | | |
| **Monitoring Zone** | Off base | Off base | Off base | Off base | Off base | Off base | On Base | On Base | On Base | On Base | Off base | Off base | | | |
| **Laboratory Reference** | 2316433 | 2096735 | 2096735 | 2313652 | 2096735 | 2313643 | 2313644 | 2256089 | 2313644 | 2313644 | 2335132 | 2335132 | | | |
| **Sample Date** | 16/03/2021 | 1/10/2020 | 1/10/2020 | 15/03/2021 | 1/10/2020 | 15/03/2021 | 17/03/2021 | 4/02/2021 | 17/03/2021 | 17/03/2021 | 18/03/2021 | 18/03/2021 | | | |
| PFPrS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | 0.012 | - | - | - |
| PFBS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | 0.03 | - | - | - |
| PFPeS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | 0.035 | - | - | - |
| di-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | 0.056 | - | - | - |
| L-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.083 | <0.001 | <0.001 | <0.001 | <0.001 | 0.29 | - | - | - |
| Total PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.083 | <0.001 | <0.001 | <0.001 | <0.001 | 0.35 | - | - | - |
| PFHpS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0075 | - | - | - |
| di-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | 0.012 | - | - | - |
| Mono-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.035 | <0.001 | <0.001 | <0.001 | <0.001 | 0.16 | - | - | - |
| L-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | 0.21 | - | - | - |
| Total PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.085 | <0.001 | <0.001 | <0.001 | <0.001 | 0.38 | - | 2 | 0.13 |
| Sum of PFHxS and PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.17 | <0.001 | <0.001 | <0.001 | <0.001 | 0.73 | 0.07 | - | - |
| PFNS | <0.001 | - | - | <0.001 | - | <0.001 | <0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | - | - | - |
| PFDS | - | - | - | - | - | - | <0.1 | - | - | - | <0.001 | <0.01 | - | - | - |
| PFECHS | <0.001 | - | - | <0.001 | - | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFBA | <0.002 | <0.001 | <0.001 | 0.0011 | <0.001 | <0.001 | 0.11 | <0.001 | <0.001 | <0.001 | <0.001 | 0.11 | - | - | - |
| PFPeA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.39 | <0.001 | <0.001 | <0.001 | <0.001 | 0.4 | - | - | - |
| PFHxA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.28 | <0.001 | <0.001 | <0.001 | <0.001 | 0.34 | - | - | - |
| PFHpA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.15 | <0.001 | <0.001 | <0.001 | <0.001 | 0.17 | - | - | - |
| PFOA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.073 | <0.001 | <0.001 | <0.001 | <0.001 | 0.092 | 0.56 | 632 | 220 |
| PFNA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | 0.041 | - | - | - |
| PFDA | <0.001 | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFUnDA | <0.001 | - | - | <0.001 | - | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFTrDA | - | - | - | - | - | - | <0.1 | - | - | - | - | - | - | - | - |
| PFTeDA | - | - | - | - | - | - | <0.1 | - | - | - | - | - | - | - | - |
| PFDoDA | <0.001 | - | - | <0.001 | - | - | <0.1 | <0.001 | - | - | <0.001 | - | - | - | - |
| PFOSA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NMeFOSA-M | <0.001 | - | - | - | - | - | <0.10 | <0.001 | - | - | - | <0.001 | - | - | - |
| NMeFOSAA | <0.001 | - | - | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NEtFOSAA | <0.001 | - | - | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 4:2 FTS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | - | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 6:2 FTS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | <0.001 | <0.001 | <0.001 | 0.066 | - | - | - |
| 8:2 FTS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.1 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 10:2 FTS | <0.001 | - | - | - | - | - | <0.025 | <0.001 | - | - | <0.001 | - | - | - | - |
| FPrPA | <0.001 | - | - | <0.001 | - | <0.001 | <0.1 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NMeFOSE | <0.001 | <0.001 | <0.001 | - | <0.001 | - | <0.1 | <0.001 | - | - | - | - | - | - | - |
| NEtFOSA-M | <0.001 | - | - | - | - | - | <0.1 | <0.001 | - | - | - | - | - | - | - |
| NEtFOSE-M | <0.001 | <0.001 | - | - | <0.001 | - | <0.1 | <0.001 | - | - | - | - | - | - | - |
| FPePA | <0.001 | - | - | <0.001 | - | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| FHpPA | <0.001 | - | - | <0.001 | - | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |

Notes:
1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 0.3 | Concentration exceeds 95% ecological guidelines. |
| **1.2** | Concentration exceeds 90% ecological guidelines. |
| 3.6 | Concentration exceeds interim drinking water guidelines |

**Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]**

| Sample Location | MW6 | MW6 | MW6 | MW6 | MW6 | MW6 | MW6 | GW31 | GW31 | GW31 | GW31 | GW31 | Interim Guidance Level for Drinking Water, MoH 2017 [2, 3] | ANZECC 90% Species Protection - Technical Draft Default Guideline Values [4] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values [4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_RUP_MW6_1_200417 | OHA_RUP_MW6_2_010817 | OHA_RUP_MW6_3_311017 | OHA_RUP_MW6_4_220218 | OHA_RUP_MW6_5_040718 | OHA_RUP_MW6_6_300920 | OHA_RUP_MW6_7_170321 | OHA_ADJ_GW31_1_120218 | OHA_ADJ_GW31_2_230518 | OHA_ADJ_GW31_3_12918 | OHA_ADJ_GW31_4_290920 | OHA_ADJ_GW31_5_160321 | | | |
| **Monitoring Zone** | On base | On base | On base | On base | On base | On base | On base | Off base | Off base | Off base | Off base | Off base | | | |
| **Laboratory Reference** | 1327497 | 841470 | 937355 | 1055089 | 1186580 | 2132127 | 2314824 | 1032528 | 1153593 | 1252502 | 2096319 | 2316425 | | | |
| **Sample Date** | 20/04/2017 | 1/08/2017 | 31/10/2017 | 22/02/2018 | 4/07/2018 | 30/09/2020 | 17/03/2021 | 12/02/2018 | 23/05/2018 | 12/09/2018 | 29/09/2020 | 16/03/2021 | | | |
| PFPrS | 0.11 | 0.21 | 0.66 | 0.17 | 0.22 | 0.063 | 0.028 | 0.0033 | 0.0038 | 0.0058 | 0.0045 | 0.0042 | - | - | - |
| PFBS | 0.56 | 0.76 | 1.8 | 0.43 | 0.72 | 0.22 | 0.11 | 0.011 | 0.01 | 0.0095 | 0.01 | 0.011 | - | - | - |
| PFPeS | 0.81 | 0.81 | 2.3 | 0.66 | 0.77 | 0.26 | 0.12 | 0.014 | 0.0089 | 0.0084 | 0.0085 | 0.0096 | - | - | - |
| di-PFHxS | 0.014 | 0.02 | 0.052 | 0.025 | 0.015 | <0.025 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFHxS | 1.1 | 1.9 | 4.1 | 1.8 | 1.7 | 0.62 | 0.25 | 0.016 | 0.013 | 0.014 | 0.016 | 0.017 | - | - | - |
| L-PFHxS | 5.3 | 8.1 | 22 | 4.1 | 11 | 4.2 | 1.6 | 0.064 | 0.055 | 0.056 | 0.063 | 0.073 | - | - | - |
| Total PFHxS | 6.4 | 10 | 26 | 5.9 | 13 | 4.8 | 1.8 | 0.08 | 0.068 | 0.07 | 0.079 | 0.09 | - | - | - |
| PFHpS | 0.34 | 0.6 | 0.49 | 0.38 | 0.34 | 0.15 | 0.06 | 0.0014 | 0.0011 | 0.0011 | 0.0015 | 0.0016 | - | - | - |
| di-PFOS | 0.31 | 0.23 | 0.27 | 0.39 | 0.27 | 0.13 | 0.075 | 0.0042 | 0.002 | <0.001 | 0.0034 | 0.0034 | - | - | - |
| Mono-PFOS | 4.9 | 2.8 | 2.4 | 3.3 | 4.5 | 2.9 | 1.1 | 0.033 | 0.016 | 0.016 | 0.028 | 0.037 | - | - | - |
| L-PFOS | 6.6 | 5.9 | 3 | 4.5 | 9.7 | 6.5 | 1.7 | 0.023 | 0.0079 | 0.0058 | 0.013 | 0.028 | - | - | - |
| Total PFOS | **12** | **8.9** | **5.7** | **8.2** | **14** | **9.5** | **2.9** | 0.06 | 0.026 | 0.022 | 0.044 | 0.068 | - | 2 | 0.13 |
| Sum of PFHxS and PFOS | 18 | 18.9 | 31.7 | 14 | 27 | 14 | 4.7 | 0.14 | 0.094 | 0.092 | 0.12 | 0.16 | 0.07 | - | - |
| PFNS | 0.0025 | 0.0091 | <0.005 | <0.005 | - | <0.05 | <0.05 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFDS | <0.001 | <0.005 | - | <0.005 | <0.001 | <0.1 | <0.1 | <0.005 | <0.001 | <0.001 | - | - | - | - | - |
| PFECHS | - | - | - | - | - | - | <0.025 | - | - | - | - | <0.001 | - | - | - |
| PFBA | 1.1 | 1.1 | 1.3 | 0.66 | 1.2 | 1.4 | 0.35 | 0.055 | 0.035 | 0.035 | 0.047 | 0.06 | - | - | - |
| PFPeA | 3.6 | 4 | 6.8 | 2.5 | 4.1 | 3.2 | 1.1 | 0.21 | 0.097 | 0.083 | 0.15 | 0.25 | - | - | - |
| PFHxA | 2.8 | 4.4 | 7 | 2 | 4 | 2.2 | 0.78 | 0.14 | 0.074 | 0.067 | 0.12 | 0.17 | - | - | - |
| PFHpA | 0.9 | 1.5 | 2.5 | 0.93 | 1.9 | 1 | 0.37 | 0.053 | 0.027 | 0.024 | 0.042 | 0.063 | - | - | - |
| PFOA | 1.3 | 1.8 | 1.7 | 0.89 | 2.2 | 1.1 | 0.35 | 0.024 | 0.013 | 0.011 | 0.019 | 0.025 | 0.56 | 632 | 220 |
| PFNA | 0.75 | 0.86 | 0.37 | 0.66 | 1.3 | 0.75 | 0.28 | 0.0059 | 0.0021 | 0.0014 | 0.0039 | 0.0076 | - | - | - |
| PFDA | 0.016 | 0.029 | 0.013 | 0.012 | 0.045 | <0.025 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFUnDA | - | 0.0057 | 0.0043 | <0.005 | - | <0.025 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFTrDA | - | - | - | - | - | <0.1 | <0.1 | - | <0.025 | <0.005 | - | - | - | - | - |
| PFTeDA | - | - | - | - | - | <0.1 | <0.1 | - | <0.1 | <0.005 | - | - | - | - | - |
| PFDoDA | - | <0.005 | <0.001 | - | - | <0.1 | <0.1 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFOSA | 0.0014 | <0.001 | <0.001 | 0.0085 | <0.001 | <0.025 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NMeFOSA-M | - | <0.005 | <0.005 | - | - | <0.1 | <0.1 | <0.025 | <0.005 | <0.001 | <0.001 | <0.001 | - | - | - |
| NMeFOSAA | - | <0.005 | <0.005 | <0.005 | - | <0.025 | <0.025 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NEtFOSAA | - | <0.005 | <0.005 | <0.005 | - | <0.025 | <0.025 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 4:2 FTS | <0.001 | <0.005 | <0.005 | <0.005 | <0.001 | <0.025 | <0.025 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 6:2 FTS | 0.53 | 0.74 | 0.33 | 1.7 | 0.46 | 0.23 | 0.84 | 0.036 | 0.0092 | 0.0052 | 0.0049 | 0.0052 | - | - | - |
| 8:2 FTS | 0.0089 | 0.0064 | <0.005 | 0.04 | 0.0069 | <0.1 | <0.1 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 10:2 FTS | - | - | - | - | - | - | <0.025 | - | - | - | - | <0.001 | - | - | - |
| FPrPA | - | - | - | - | - | - | <0.1 | - | - | - | - | <0.001 | - | - | - |
| NMeFOSE | - | <0.005 | <0.005 | <0.025 | - | <0.1 | <0.1 | <0.025 | <0.005 | <0.001 | <0.001 | <0.001 | - | - | - |
| NEtFOSA-M | - | <0.005 | <0.005 | - | - | <0.1 | <0.1 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NEtFOSE-M | - | <0.005 | <0.005 | <0.025 | - | <0.1 | <0.1 | <0.025 | <0.005 | <0.001 | <0.001 | <0.001 | - | - | - |
| FPePA | - | - | - | - | - | - | <0.025 | - | - | - | - | <0.001 | - | - | - |
| FHpPA | - | - | - | - | - | - | <0.025 | - | - | - | - | <0.001 | - | - | - |

Notes:
1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 0.3 | Concentration exceeds 95% ecological guidelines. |
| 1.2 | Concentration exceeds 90% ecological guidelines. |
| 3.6 | Concentration exceeds interim drinking water guidelines |

**Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]**

| Sample Location | GW53 | GW53 | GW53 | GW53 | GW53 | GW6 | GW6 | GW6 | GW6 | GW6 | GW6 | Interim Guidance Level for Drinking Water, MoH 2017 [2, 3] | ANZECC 90% Species Protection - Technical Draft Default Guideline Values [4] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values [4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_ADJ_GW53_1_150218 | OHA_ADJ_GW53_2_150518 | OHA_ADJ_GW53_3_10918 | OHA_ADJ_GW53_4_300920 | OHA_ADJ_GW53_5_160321 | OHA_ADJ_GW6_1_111217 | OHA_ADJ_GW6_2_130218 | OHA_ADJ_GW6_3_140518 | OHA_ADJ_GW6_4_13918 | OHA_ADJ_GW6_5_290920 | OHA_ADJ_GW6_6_160321 | | | |
| **Monitoring Zone** | Off base | Off base | Off base | Off base | Off base | On base | On base | On base | On base | On base | On base | | | |
| **Laboratory Reference** | 1040534 | 1139707 | 1244388 | 2096317 | 2316429 | 989127 | 1032179 | 1133549 | 1260155 | 2096315 | 2313648 | | | |
| **Sample Date** | 15/02/2018 | 15/05/2018 | 10/09/2018 | 30/09/2020 | 16/03/2021 | 11/12/2017 | 13/02/2018 | 14/05/2018 | 13/09/2018 | 29/09/2020 | 16/03/2021 | | | |
| PFPrS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0022 | 0.0034 | - | 0.004 | 0.0025 | 0.0016 | - | - | - |
| PFBS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0067 | 0.0065 | 0.0022 | 0.0038 | 0.0027 | 0.0023 | - | - | - |
| PFPeS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0054 | 0.0056 | 0.0013 | 0.0038 | 0.0039 | 0.0031 | - | - | - |
| di-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.011 | 0.0097 | 0.002 | 0.0026 | 0.0023 | 0.0035 | - | - | - |
| L-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.066 | 0.054 | 0.014 | 0.014 | 0.014 | 0.014 | - | - | - |
| Total PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.077 | 0.064 | 0.016 | 0.017 | 0.016 | 0.018 | - | - | - |
| PFHpS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0018 | 0.0023 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| di-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0027 | 0.0022 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.026 | 0.025 | 0.0089 | 0.003 | 0.0044 | 0.0038 | - | - | - |
| L-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.023 | 0.023 | 0.0092 | 0.0014 | 0.0042 | 0.0043 | - | - | - |
| Total PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.052 | 0.05 | 0.018 | 0.0044 | 0.0086 | 0.0081 | - | 2 | 0.13 |
| Sum of PFHxS and PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.13 | 0.11 | 0.034 | 0.021 | 0.025 | 0.026 | 0.07 | - | - |
| PFNS | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFDS | <0.005 | <0.001 | <0.001 | - | - | - | <0.005 | <0.001 | <0.001 | - | - | - | - | - |
| PFECHS | - | - | - | - | <0.001 | - | - | - | - | - | <0.001 | - | - | - |
| PFBA | <0.005 | <0.005 | <0.005 | <0.001 | <0.002 | 0.025 | 0.02 | - | <0.01 | - | 0.011 | - | - | - |
| PFPeA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.057 | 0.044 | 0.0035 | 0.0037 | 0.003 | <0.001 | - | - | - |
| PFHxA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.044 | 0.038 | 0.0039 | 0.0053 | 0.0038 | 0.0072 | - | - | - |
| PFHpA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.02 | 0.016 | 0.0018 | 0.0021 | 0.0024 | 0.003 | - | - | - |
| PFOA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.014 | 0.014 | 0.0022 | 0.0018 | 0.0019 | 0.0031 | 0.56 | 632 | 220 |
| PFNA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0038 | 0.0034 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFDA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFUnDA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - | - |
| PFTrDA | <0.025 | <0.025 | - | - | - | - | - | <0.025 | <0.005 | - | - | - | - | - |
| PFTeDA | - | - | - | - | - | - | - | <0.025 | <0.005 | - | - | - | - | - |
| PFDoDA | <0.025 | <0.025 | <0.001 | <0.001 | <0.001 | - | <0.001 | <0.025 | <0.001 | - | - | - | - | - |
| PFOSA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NMeFOSA-M | <0.025 | <0.005 | <0.001 | <0.001 | <0.001 | - | - | <0.005 | <0.001 | <0.001 | - | - | - | - |
| NMeFOSAA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NEtFOSAA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 4:2 FTS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | <0.001 | - | - | - | - | - | - |
| 6:2 FTS | <0.001 | <0.01 | <0.001 | <0.001 | <0.001 | 0.023 | 0.0032 | <0.01 | 0.001 | - | - | - | - | - |
| 8:2 FTS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | - | <0.001 | - | - | - |
| 10:2 FTS | - | - | - | - | <0.001 | - | - | - | - | - | - | - | - | - |
| FPrPA | - | - | - | - | <0.001 | - | - | - | - | - | <0.001 | - | - | - |
| NMeFOSE | <0.025 | <0.005 | <0.005 | <0.001 | <0.001 | - | <0.025 | <0.005 | <0.001 | <0.001 | - | - | - | - |
| NEtFOSA-M | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | <0.001 | <0.001 | <0.001 | - | - | - | - |
| NEtFOSE-M | <0.025 | <0.005 | <0.005 | <0.001 | <0.001 | - | <0.025 | <0.005 | <0.001 | <0.001 | - | - | - | - |
| FPePA | - | - | - | - | <0.001 | - | - | - | - | - | <0.001 | - | - | - |
| FHpPA | - | - | - | - | <0.001 | - | - | - | - | - | <0.001 | - | - | - |

Notes:
1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 0.3 | Concentration exceeds 95% ecological guidelines. |
| 1.2 | Concentration exceeds 90% ecological guidelines. |
| 3.6 | Concentration exceeds interim drinking water guidelines |

**Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]**

| Sample Location | GW65 | GW65 | GW65 | GW65 | GW65 | GW67 | GW67 | GW67 | GW67 | GW67 | Interim Guidance Level for Drinking Water, MoH 2017 [2, 3] | ANZECC 90% Species Protection - Technical Draft Default Guideline Values [4] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values [4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_ADJ_GW65_1_210218 | OHA_ADJ_GW65_2_170518 | OHA_ADJ_GW65_3_11918 | OHA_ADJ_GW65_4_290920 | OHA_ADJ_GW65_5_150321 | OHA_ADJ_GW67_1_210218 | OHA_ADJ_GW67_2_140518 | OHA_ADJ_GW67_3_11918 | OHA_ADJ_GW67_4_300920 | OHA_ADJ_GW67_5_170321 | | | |
| **Monitoring Zone** | Off base | Off base | Off base | Off base | Off base | Off base | Off base | Off base | Off base | Off base | | | |
| **Laboratory Reference** | 1047797 | 1142284 | 1244707 | 2096328 | 2313647 | 1047809 | 1134445 | 1244090 | 2096741 | 2317694 | | | |
| **Sample Date** | 21/02/2018 | 17/05/2018 | 11/09/2018 | 29/09/2020 | 15/03/2021 | 21/02/2018 | 14/05/2018 | 11/09/2018 | 30/09/2020 | 17/03/2021 | | | |
| PFPrS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | <0.001 | 0.0013 | - | - | - |
| PFBS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFPeS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| di-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| L-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0016 | 0.0018 | 0.0012 | <0.001 | <0.001 | - | - | - |
| Total PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0016 | 0.0018 | 0.0012 | <0.001 | <0.001 | - | - | - |
| PFHpS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| di-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| L-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Total PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | 2 | 0.13 |
| Sum of PFHxS and PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.0016 | 0.0018 | 0.0012 | <0.001 | <0.001 | 0.07 | - | - |
| PFNS | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | <0.001 | - | <0.001 | - | - | - |
| PFDS | <0.005 | <0.001 | <0.001 | - | - | <0.005 | <0.001 | <0.001 | - | - | - | - | - |
| PFECHS | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - | - |
| PFBA | <0.005 | <0.01 | <0.005 | <0.001 | <0.001 | - | - | - | <0.001 | 0.0072 | - | - | - |
| PFPeA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | <0.001 | <0.001 | - | - | - |
| PFHxA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFHpA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFOA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.56 | 632 | 220 |
| PFNA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFDA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFUnDA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | <0.001 | - | - | - |
| PFTrDA | - | <0.025 | <0.001 | - | - | - | <0.025 | <0.005 | - | - | - | - | - |
| PFTeDA | - | - | <0.005 | - | - | - | <0.025 | <0.005 | - | - | - | - | - |
| PFDoDA | - | <0.025 | <0.001 | <0.001 | <0.001 | - | <0.025 | <0.001 | - | <0.001 | - | - | - |
| PFOSA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NMeFOSA-M | - | <0.005 | <0.005 | <0.001 | - | - | <0.005 | <0.005 | - | - | - | - | - |
| NMeFOSAA | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NEtFOSAA | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 4:2 FTS | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | - | - | <0.001 | - | - | - |
| 6:2 FTS | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.01 | <0.001 | <0.001 | <0.001 | - | - | - |
| 8:2 FTS | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 10:2 FTS | - | - | - | - | - | - | - | - | - | <0.001 | - | - | - |
| FPrPA | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - | - |
| NMeFOSE | - | <0.005 | <0.001 | <0.001 | - | - | <0.005 | <0.001 | <0.001 | - | - | - | - |
| NEtFOSA-M | - | <0.001 | <0.005 | <0.001 | - | - | <0.001 | <0.005 | - | - | - | - | - |
| NEtFOSE-M | - | <0.005 | <0.001 | <0.001 | - | - | <0.005 | <0.001 | <0.001 | - | - | - | - |
| FPePA | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - | - |
| FHpPA | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - | - |

Notes:
1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 0.3 | Concentration exceeds 95% ecological guidelines. |
| 1.2 | Concentration exceeds 90% ecological guidelines. |
| 3.6 | Concentration exceeds interim drinking water guidelines |

**Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]**

| Sample Location | WS2 | WS2 | WS2 | WS2 | WS2 | WS2 | WS2 | WS2 | Interim Guidance Level for Drinking Water, MoH 2017 [2, 3] | ANZECC 90% Species Protection - Technical Draft Default Guideline Values [4] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values [4] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_QRY_WS2_1_240715 | OHA_QRY_WS2_2_210717 | OHA_QRY_WS2_3_210218 | OHA_QRY_WS2_4_030718 | OHA_QRY_WS2_5_221119 | OHA_QRY_WS2_6_020620 | OHA_QRY_WS2_7_290920 | OHA_QRY_WS2_8_180321 | | | |
| **Monitoring Zone** | Off base | Off base | Off base | Off base | Off base | Off base | Off base | Off base | | | |
| **Laboratory Reference** | ES1526917 | 1326866 | 1055089 | 1186581 | 1740590 | 1983524 | 2096325 | 2327922 | | | |
| **Sample Date** | 24/07/2015 | 21/07/2017 | 21/02/2018 | 3/07/2018 | 22/11/2019 | 2/06/2020 | 29/09/2020 | 18/03/2021 | | | |
| PFPrS | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFBS | <0.02 | <0.001 | <0.001 | 0.0011 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFPeS | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| di-PFHxS | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFHxS | - | <0.001 | <0.001 | 0.0011 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| L-PFHxS | - | 0.0038 | 0.0033 | 0.0053 | 0.0031 | 0.0021 | 0.0024 | 0.0029 | - | - | - |
| Total PFHxS | <0.02 | 0.0038 | 0.0033 | 0.0064 | 0.0031 | 0.0021 | 0.0024 | 0.0029 | - | - | - |
| PFHpS | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| di-PFOS | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFOS | - | <0.001 | 0.001 | 0.0016 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| L-PFOS | - | <0.001 | <0.001 | 0.0025 | <0.001 | 0.0011 | 0.0016 | <0.001 | - | - | - |
| Total PFOS | <0.02 | <0.001 | 0.001 | 0.0041 | <0.001 | 0.0011 | 0.0016 | <0.001 | - | 2 | 0.13 |
| Sum of PFHxS and PFOS | <0.02 | 0.0038 | 0.0043 | 0.01 | 0.0031 | 0.0032 | 0.004 | 0.0029 | 0.07 | - | - |
| PFNS | - | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.005 | - | - | - |
| PFDS | <0.02 | <0.005 | <0.005 | <0.001 | <0.001 | <0.001 | - | <0.01 | - | - | - |
| PFECHS | - | - | - | - | - | - | - | <0.001 | - | - | - |
| PFBA | - | <0.005 | <0.005 | <0.005 | 0.0033 | <0.005 | 0.0029 | 0.0034 | - | - | - |
| PFPeA | - | 0.0072 | 0.0049 | 0.0076 | 0.0043 | 0.0027 | 0.0025 | 0.004 | - | - | - |
| PFHxA | <0.02 | 0.004 | 0.0031 | 0.0055 | 0.0031 | 0.0017 | 0.0016 | 0.0026 | - | - | - |
| PFHpA | <0.02 | 0.002 | 0.0017 | 0.0028 | 0.0016 | 0.0011 | <0.001 | 0.0015 | - | - | - |
| PFOA | <0.02 | 0.0018 | 0.0014 | 0.0024 | 0.0012 | 0.0036 | <0.001 | 0.0012 | 0.56 | 632 | 220 |
| PFNA | <0.02 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFDA | <0.02 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFUnDA | <0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFTrDA | <0.05 | - | - | - | <0.001 | <0.001 | - | - | - | - | - |
| PFTeDA | <0.5 | - | - | - | <0.001 | <0.001 | - | - | - | - | - |
| PFDoDA | <0.05 | <0.005 | - | - | <0.001 | <0.001 | <0.001 | - | - | - | - |
| PFOSA | <0.02 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NMeFOSA-M | <0.5 | <0.005 | <0.005 | - | <0.001 | <0.001 | - | <0.001 | - | - | - |
| NMeFOSAA | - | <0.005 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NEtFOSAA | - | <0.005 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 4:2 FTS | - | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 6:2 FTS | <0.1 | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 8:2 FTS | <0.1 | <0.001 | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 10:2 FTS | - | - | - | - | - | - | - | - | - | - | - |
| FPrPA | - | - | - | - | - | - | - | <0.001 | - | - | - |
| NMeFOSE | <0.5 | <0.005 | <0.005 | <0.005 | <0.001 | <0.001 | - | - | - | - | - |
| NEtFOSA-M | <0.05 | <0.005 | <0.005 | - | <0.001 | <0.001 | - | - | - | - | - |
| NEtFOSE-M | <0.5 | <0.005 | <0.005 | <0.005 | <0.001 | <0.001 | - | - | - | - | - |
| FPePA | - | - | - | - | - | - | - | <0.001 | - | - | - |
| FHpPA | - | - | - | - | - | - | - | <0.001 | - | - | - |

Notes:
1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 0.3 | Concentration exceeds 95% ecological guidelines. |
| 1.2 | Concentration exceeds 90% ecological guidelines. |
| 3.6 | Concentration exceeds interim drinking water guidelines |

**Table 3 Cont: Groundwater Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]**

| Sample Location | WS1 | WS1 | WS1 | WS1 | WS1 | Interim Guidance Level for Drinking Water, MoH 2017 [2, 3] | ANZECC 90% Species Protection - Technical Draft Default Guideline Values [4] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values [4] |
|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_FTA_WS1_190218 | OHA_FTA_WS1_030718 | OHA_FTA_WS1_210718 | OHA_FTA_WS1_4_290920 | OHA_FTA_WS1_5_170321 | | | |
| **Monitoring Zone** | On base | On base | On base | On base | On base | | | |
| **Laboratory Reference** | 1055089 | 1186578 | 1326866 | 2096316 | 2318531 | | | |
| **Sample Date** | 19/02/2018 | 3/07/2018 | 21/07/2018 | 29/09/2020 | 17/03/2021 | | | |
| PFPrS | 0.01 | 0.0098 | 0.0097 | 0.012 | 0.013 | - | - | - |
| PFBS | 0.022 | 0.024 | 0.023 | 0.026 | 0.026 | - | - | - |
| PFPeS | 0.02 | 0.021 | 0.023 | 0.023 | 0.024 | - | - | - |
| di-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| Mono-PFHxS | 0.027 | 0.029 | 0.03 | 0.035 | 0.033 | - | - | - |
| L-PFHxS | 0.11 | 0.12 | 0.12 | 0.12 | 0.13 | - | - | - |
| Total PFHxS | 0.14 | 0.15 | 0.15 | 0.16 | 0.16 | - | - | - |
| PFHpS | 0.0022 | 0.0026 | 0.0034 | 0.0023 | 0.0018 | - | - | - |
| di-PFOS | 0.0029 | 0.0031 | 0.0024 | 0.0041 | 0.0029 | - | - | - |
| Mono-PFOS | 0.02 | 0.022 | 0.013 | 0.021 | 0.019 | - | - | - |
| L-PFOS | 0.0077 | 0.011 | 0.0071 | 0.0073 | 0.011 | - | - | - |
| Total PFOS | 0.031 | 0.036 | 0.022 | 0.032 | 0.033 | - | 2 | 0.13 |
| Sum of PFHxS and PFOS | 0.17 | 0.19 | 0.17 | 0.19 | 0.19 | 0.07 | - | - |
| PFNS | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFDS | <0.005 | <0.001 | <0.005 | - | - | - | - | - |
| PFECHS | - | - | - | - | <0.001 | - | - | - |
| PFBA | 0.019 | 0.018 | 0.018 | 0.018 | 0.018 | - | - | - |
| PFPeA | 0.11 | 0.1 | 0.1 | 0.093 | 0.089 | - | - | - |
| PFHxA | 0.09 | 0.092 | 0.097 | 0.088 | 0.082 | - | - | - |
| PFHpA | 0.028 | 0.027 | 0.025 | 0.029 | 0.03 | - | - | - |
| PFOA | 0.02 | 0.022 | 0.018 | 0.021 | 0.024 | 0.56 | 632 | 220 |
| PFNA | 0.0064 | 0.0078 | 0.0056 | 0.0062 | 0.0065 | - | - | - |
| PFDA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFUnDA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| PFTrDA | - | <0.025 | - | - | - | - | - | - |
| PFTeDA | - | <0.1 | - | - | - | - | - | - |
| PFDoDA | - | <0.025 | <0.005 | <0.001 | <0.001 | - | - | - |
| PFOSA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| NMeFOSA-M | <0.005 | - | <0.005 | <0.001 | - | - | - | - |
| NMeFOSAA | <0.005 | <0.001 | <0.005 | <0.001 | <0.001 | - | - | - |
| NEtFOSAA | <0.005 | <0.001 | <0.005 | <0.001 | <0.001 | - | - | - |
| 4:2 FTS | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 6:2 FTS | 0.12 | 0.11 | 0.12 | 0.089 | 0.1 | - | - | - |
| 8:2 FTS | <0.005 | <0.001 | <0.001 | <0.001 | <0.001 | - | - | - |
| 10:2 FTS | - | - | - | - | <0.001 | - | - | - |
| FPrPA | - | - | - | - | <0.001 | - | - | - |
| NMeFOSE | <0.005 | - | <0.005 | <0.001 | - | - | - | - |
| NEtFOSA-M | <0.005 | - | <0.005 | <0.001 | - | - | - | - |
| NEtFOSE-M | <0.005 | - | <0.005 | <0.001 | - | - | - | - |
| FPePA | - | - | - | - | <0.001 | - | - | - |
| FHpPA | - | - | - | - | <0.001 | - | - | - |

Notes:
1. Results in µg/L.
2. Ministry of Health (MoH, 2017) Interim Guidance Level for Drinking Water, PFOA, PFOS and PFHxS.
3. Australian Government Department of Health (AGDoH, 2017) Health Based Guidance Values for PFAS for Use in Site Investigations in Australia.
4. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
5. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
6. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 0.3 | Concentration exceeds 95% ecological guidelines. |
| 1.2 | Concentration exceeds 90% ecological guidelines. |
| 3.6 | Concentration exceeds interim drinking water guidelines |

**Table 4: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS)** [1]

| **Sample Location** | SW33 | SW33 | SW33 | SW33 | SW33 | SW36 | SW36 | SW36 | SW36 | SW36 | ANZECC 90% Species Protection - Technical Draft Default Guideline Values[2] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_ADJ_SW33_1_190218 | OHA_ADJ_SW33_2_220518 | OHA_ADJ_SW33_3_120918 | OHA_ADJ_SW33_4_290920 | OHA_ADJ_SW33_5_160321 | OHA_ADJ_SW36_1_220218 | OHA_ADJ_SW36_2_170518 | OHA_ADJ_SW36_3_120918 | OHA_ADJ_SW36_4_290920 | OHA_ADJ_SW36_6_160321 | | |
| **MonitoringZone** | 1047510 | 1147417 | 1248198 | 2094714 | 2316431 | 1047802 | 1142104 | Off base | Off base | Off base | | |
| **Laboratory Reference** | Off base | Off base | Off base | Off base | Off base | Off base | Off base | 1251329 | 2094717 | 2316427 | | |
| **Sample Date** | 19/02/2018 | 22/05/2018 | 12/09/2018 | 29/09/2020 | 16/03/2021 | 22/02/2018 | 17/05/2018 | 12/09/2018 | 29/09/2020 | 16/03/2021 | | |
| PFPrS | 0.0036 | <0.001 | 0.0034 | <0.025 | 0.002 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | - | - |
| PFBS | 0.012 | <0.001 | 0.0077 | <0.025 | 0.0062 | <0.001 | <0.001 | <0.001 | <0.025 | 0.0017 | - | - |
| PFPeS | 0.012 | <0.001 | 0.0075 | <0.025 | 0.0058 | <0.001 | <0.001 | <0.001 | <0.025 | 0.0019 | - | - |
| di- PFHxS | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | - | - |
| Mono- PFHxS | 0.019 | <0.001 | 0.012 | <0.025 | 0.0088 | <0.001 | <0.001 | <0.001 | <0.025 | 0.003 | - | - |
| L-PFHxS | 0.11 | 0.0015 | 0.067 | <0.025 | 0.049 | <0.001 | <0.001 | <0.001 | <0.025 | 0.018 | - | - |
| Total PFHxS [3] | 0.13 | 0.0015 | 0.079 | <0.025 | 0.058 | <0.001 | <0.001 | <0.001 | <0.025 | 0.021 | - | - |
| PFHpS | 0.0033 | <0.001 | 0.0017 | <0.025 | 0.0013 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | - | - |
| di- PFOS | 0.0046 | <0.001 | 0.0025 | <0.025 | 0.0021 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | - | - |
| Mono- PFOS | 0.06 | <0.001 | 0.032 | <0.025 | 0.036 | <0.001 | <0.001 | <0.001 | <0.025 | 0.017 | - | - |
| L-PFOS | 0.047 | 0.0013 | 0.024 | <0.025 | 0.052 | <0.001 | <0.001 | <0.001 | <0.025 | 0.016 | - | - |
| Total PFOS [3] | 0.11 | 0.0013 | 0.058 | <0.025 | 0.09 | <0.001 | <0.001 | <0.001 | <0.025 | 0.033 | 2 | 0.13 |
| Sum of PFHxS and PFOS [4] | 0.24 | 0.0028 | 0.14 | <0.025 | 0.15 | <0.001 | <0.001 | <0.001 | <0.025 | 0.054 | - | - |
| PFNS | <0.005 | <0.001 | <0.001 | <0.05 | <0.001 | <0.005 | <0.001 | <0.001 | <0.05 | <0.001 | - | - |
| PFDS | <0.005 | <0.001 | <0.001 | <0.1 | - | <0.005 | <0.001 | <0.001 | <0.1 | - | - | - |
| PFECHS | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - |
| PFBA | 0.087 | - | 0.044 | <0.2 | 0.043 | <0.005 | <0.01 | <0.005 | <0.2 | 0.019 | - | - |
| PFPeA | 0.4 | 0.0037 | 0.16 | <0.1 | 0.17 | <0.001 | <0.001 | <0.001 | <0.1 | 0.072 | - | - |
| PFHxA | 0.29 | 0.0033 | 0.13 | <0.025 | 0.13 | <0.001 | <0.001 | <0.001 | <0.025 | 0.05 | - | - |
| PFHpA | 0.11 | 0.0013 | 0.049 | <0.025 | 0.054 | <0.001 | <0.001 | <0.001 | <0.025 | 0.026 | - | - |
| PFOA | 0.051 | <0.001 | 0.021 | <0.025 | 0.021 | <0.001 | <0.001 | <0.001 | <0.025 | 0.012 | 632 | 220 |
| PFNA | 0.018 | <0.001 | 0.0055 | <0.025 | 0.0092 | <0.001 | <0.001 | <0.001 | <0.025 | 0.0048 | - | - |
| PFDA | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | - | - |
| PFUnDA | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.005 | <0.025 | <0.001 | - | - |
| PFTrDA | - | <0.005 | - | <0.1 | - | - | <0.025 | <0.005 | <0.1 | - | - | - |
| PFTeDA | - | <0.025 | - | <0.1 | - | - | <0.1 | - | <0.1 | - | - | - |
| PFDoDA | - | <0.005 | - | <0.1 | <0.001 | - | <0.025 | <0.005 | <0.1 | <0.001 | - | - |
| PFOSA | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | - | - |
| NMeFOSA-M | - | <0.001 | <0.005 | <0.1 | <0.001 | - | <0.005 | <0.005 | <0.1 | <0.001 | - | - |
| NMeFOSAA | <0.005 | <0.001 | <0.001 | <0.025 | <0.001 | <0.005 | <0.001 | <0.005 | <0.025 | <0.001 | - | - |
| NEtFOSAA | <0.005 | <0.001 | <0.001 | <0.025 | <0.001 | <0.005 | <0.001 | <0.005 | <0.025 | <0.001 | - | - |
| 4:2 FTS | <0.005 | <0.001 | - | <0.025 | <0.001 | <0.005 | <0.001 | <0.001 | <0.025 | <0.001 | - | - |
| 6:2 FTS | 0.0051 | 0.0016 | 0.017 | <0.05 | <0.001 | <0.005 | <0.001 | <0.001 | <0.05 | <0.001 | - | - |
| 8:2 FTS | <0.005 | <0.001 | <0.001 | <0.1 | <0.001 | <0.005 | <0.001 | <0.005 | <0.1 | <0.001 | - | - |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - |
| FPrPA | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - |
| NMeFOSE | <0.025 | <0.005 | <0.005 | <0.1 | <0.001 | - | <0.005 | <0.005 | <0.1 | <0.001 | - | - |
| NEtFOSA-M | - | <0.001 | <0.005 | <0.1 | <0.001 | - | <0.001 | <0.005 | <0.1 | <0.001 | - | - |
| NEtFOSE-M | <0.025 | <0.005 | <0.005 | <0.1 | <0.001 | - | <0.005 | <0.005 | <0.1 | <0.001 | - | - |
| FPePA | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - |
| FHpPA | - | - | - | - | <0.001 | - | - | - | - | <0.001 | - | - |

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
4. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 3.6 | Concentration exceeds 95% ecological guidelines. |

**Table 4 Cont: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS)** [1]

| **Sample Location** | SW4 | SW4 | SW4 | SW6 | SW6 | SW6 | SW6 | ANZECC 90% Species Protection - Technical Draft Default Guideline Values[2] | ANZECC 95% Species Protection - Technical Draft Default Guideline Values[2] |
|---|---|---|---|---|---|---|---|---|---|
| **Sample Name** | OHA_SHW_ SW4_1_040817 | OHA_SHW_SW4_2_021020 | OHA_SHW_SW4_3_180321 | OHA_DPB_SW6_1_040817 | OHA_DPB_SW6_2_011117 | OHA_DPB_SW6_3_030718 | OHA_DPB_SW6_4_290920 | | |
| **MonitoringZone** | On base | On base | On base | Off base | Off base | Off base | Off base | | |
| **Laboratory Reference** | 841470 | 2094371 | 2327926 | 841470 | 937355 | 1186578 | 2094713 | | |
| **Sample Date** | 4/08/2017 | 2/10/2020 | 18/03/2021 | 4/08/2017 | 1/11/2017 | 3/07/2018 | 29/09/2020 | | |
| PFPrS | <0.001 | <0.001 | <0.001 | 0.023 | 0.042 | 0.013 | <0.025 | - | - |
| PFBS | <0.001 | <0.001 | 0.0012 | 0.079 | 0.12 | 0.037 | <0.025 | - | - |
| PFPeS | <0.001 | <0.001 | <0.001 | 0.083 | 0.18 | 0.045 | <0.025 | - | - |
| di- PFHxS | <0.001 | <0.001 | <0.001 | 0.002 | 0.0039 | <0.001 | <0.025 | - | - |
| Mono-PFHxS | <0.001 | <0.001 | <0.001 | 0.3 | 0.28 | 0.073 | 0.03 | - | - |
| L-PFHxS | <0.001 | <0.001 | 0.005 | 1.6 | 1.8 | 0.48 | 0.19 | - | - |
| Total PFHxS [3] | <0.001 | <0.001 | 0.005 | 1.9 | 2.1 | 0.55 | 0.22 | - | - |
| PFHpS | <0.001 | <0.001 | <0.001 | 0.066 | 0.13 | 0.027 | <0.025 | - | - |
| di- PFOS | <0.001 | <0.001 | <0.001 | 0.036 | 0.096 | 0.013 | <0.025 | - | - |
| Mono-PFOS | <0.001 | <0.001 | 0.0029 | 0.52 | 0.82 | 0.15 | 0.093 | - | - |
| L-PFOS | <0.001 | <0.001 | 0.0036 | 0.86 | 1 | 0.21 | 0.13 | - | - |
| Total PFOS [3] | <0.001 | <0.001 | 0.0065 | 1.4 | 1.9 | 0.37 | 0.22 | 2 | 0.13 |
| Sum of PFHxS and PFOS [4] | - | <0.001 | 0.012 | - | - | 0.92 | 0.44 | - | - |
| PFNS | <0.005 | <0.001 | <0.001 | <0.005 | <0.005 | <0.001 | <0.05 | - | - |
| PFDS | <0.005 | - | <0.001 | <0.005 | - | <0.001 | <0.1 | - | - |
| PFECHS | - | - | <0.001 | - | - | - | - | - | - |
| PFBA | 0.0054 | 0.0095 | 0.037 | 0.23 | 0.32 | 0.11 | <0.2 | - | - |
| PFPeA | <0.001 | <0.001 | 0.096 | 1.1 | 1.5 | 0.44 | 0.22 | - | - |
| PFHxA | <0.001 | 0.001 | 0.079 | 1 | 0.96 | 0.32 | 0.14 | - | - |
| PFHpA | <0.001 | <0.001 | 0.048 | 0.32 | 0.47 | 0.16 | 0.073 | - | - |
| PFOA | <0.001 | <0.001 | 0.013 | 0.61 | 0.73 | 0.19 | 0.065 | 632 | 220 |
| PFNA | <0.001 | <0.001 | 0.0039 | 0.15 | 0.32 | 0.092 | 0.029 | - | - |
| PFDA | <0.001 | <0.001 | <0.001 | 0.0012 | 0.002 | 0.0011 | <0.025 | - | - |
| PFUnDA | <0.005 | <0.001 | <0.001 | <0.005 | 0.0012 | <0.001 | <0.025 | - | - |
| PFTrDA | - | <0.001 | <0.005 | - | - | <0.025 | <0.1 | - | - |
| PFTeDA | - | <0.001 | - | - | - | <0.1 | <0.1 | - | - |
| PFDoDA | <0.005 | <0.001 | <0.005 | <0.005 | <0.001 | <0.025 | <0.1 | - | - |
| PFOSA | <0.001 | <0.001 | <0.001 | <0.001 | 0.0012 | <0.001 | <0.025 | - | - |
| NMeFOSA-M | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.1 | - | - |
| NMeFOSAA | <0.005 | <0.001 | <0.001 | <0.005 | <0.005 | <0.001 | <0.025 | - | - |
| NEtFOSAA | <0.005 | <0.001 | <0.001 | <0.005 | <0.005 | <0.001 | <0.025 | - | - |
| 4:2 FTS | <0.005 | - | <0.001 | 0.0059 | 0.0053 | <0.001 | <0.025 | - | - |
| 6:2 FTS | <0.005 | <0.001 | 0.0096 | 0.81 | 1.5 | 0.33 | 0.053 | - | - |
| 8:2 FTS | <0.005 | <0.001 | <0.001 | <0.005 | 0.0054 | <0.001 | <0.1 | - | - |
| 10:2 Fluorotelomer sulfonic acid (10:2 FTS) | - | - | <0.001 | - | - | - | - | - | - |
| FPrPA | - | - | <0.001 | - | - | - | - | - | - |
| NMeFOSE | <0.005 | <0.001 | <0.005 | <0.005 | <0.005 | <0.005 | <0.1 | - | - |
| NEtFOSA-M | - | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.1 | - | - |
| NEtFOSE-M | <0.005 | - | <0.005 | <0.005 | <0.005 | <0.005 | <0.1 | - | - |
| FPePA | - | - | <0.001 | - | - | - | - | - | - |
| FHpPA | - | - | <0.001 | - | - | - | - | - | - |

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. Total PFOS, PFHxS are calculated by summing monoethyl, dimethyl and linear isomers. Where an isomer is below the detection limit it is not added to the summation. This is following the method in the reported lab results.
4. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

| | |
|---|---|
| - | Parameter not tested / no guideline value available |
| 3.6 | Concentration exceeds 95% ecological guidelines. |





TE OPE KĀTUA O AOTEAROA
DEFENCE FORCE

horizons
REGIONAL COUNCIL

**KEY :**

**Sample Type:**

- Groundwater
- Surface water
- Groundwater (Sample not able to be collected)
- Surface water (Sample not able to be collected)
- River/Streams/Drains
- RNZAF Base Ohakea Boundary

SOURCE:
Aerial imagery flown 2015-16 and 2019, supplied by NZDF.
Cadastral and Topographic information supplied by LINZ.

| NO. | REVISION HISTORY | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| A | FINAL | JUL 2021 |
| A | ISSUED FOR REVIEW | MAY 2021 |

**PROJECT NAME:**

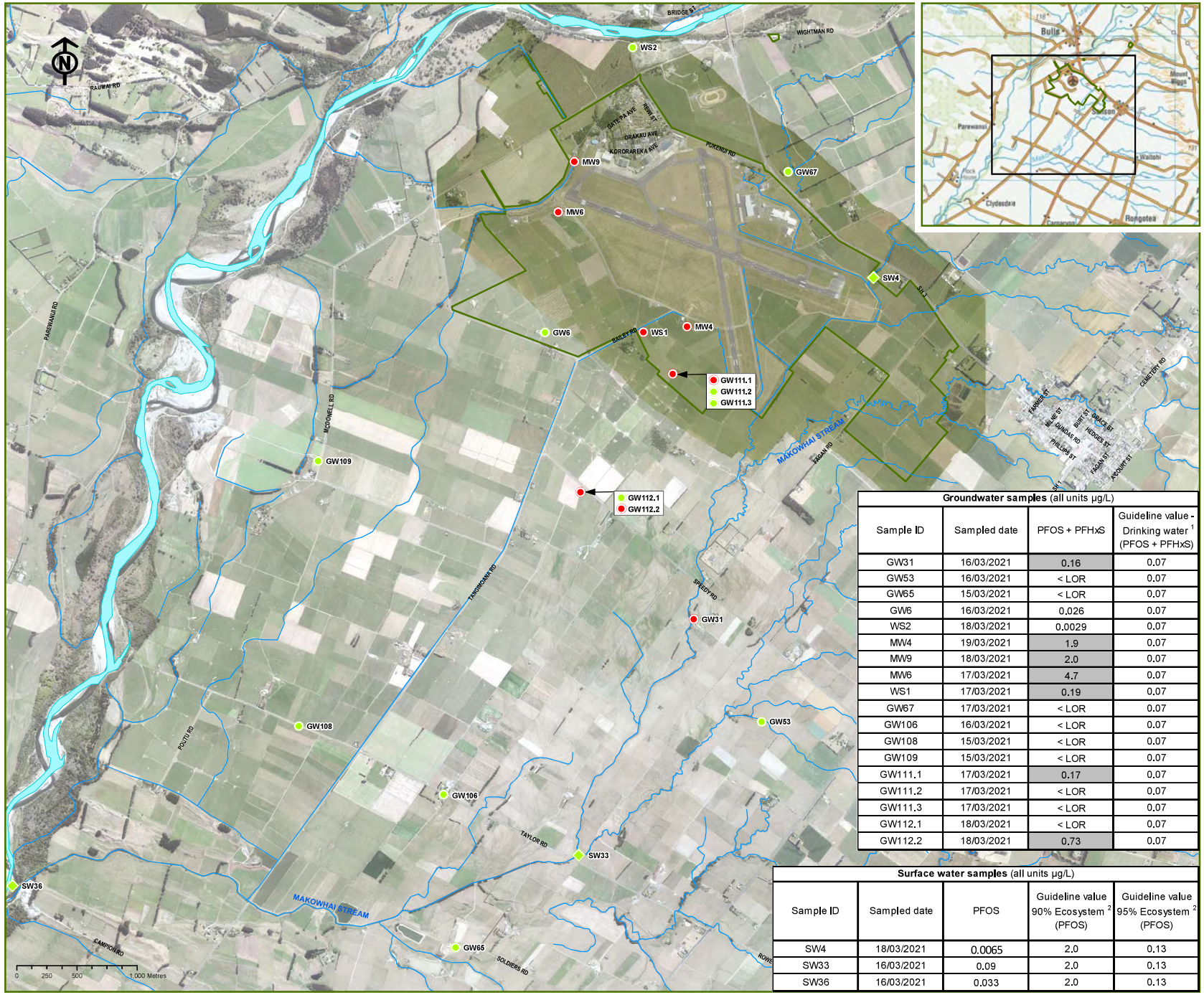
RNZAF BASE OHAKEA
PFAS INVESTIGATION:
LONG TERM
MONITORING PLAN

**FIGURE TITLE:**

SAMPLE LOCATION PLAN:
MARCH 2021

| SCALE: | FIGURE NO.: | ISSUE NO.: |
|---|---|---|
| 1:30,000 (A3) | 1 | A |

A02744117Z001_SampleLocationPlan




**Groundwater samples** (all units µg/L)

| Sample ID | Sampled date | PFOS + PFHxS | Guideline value - Drinking water [1] (PFOS + PFHxS) |
|---|---|---|---|
| GW31 | 16/03/2021 | 0.16 | 0.07 |
| GW53 | 16/03/2021 | < LOR | 0.07 |
| GW65 | 15/03/2021 | < LOR | 0.07 |
| GW6 | 16/03/2021 | 0.026 | 0.07 |
| WS2 | 18/03/2021 | 0.0029 | 0.07 |
| MW4 | 19/03/2021 | 1.9 | 0.07 |
| MW9 | 18/03/2021 | 2.0 | 0.07 |
| MW6 | 17/03/2021 | 4.7 | 0.07 |
| WS1 | 17/03/2021 | 0.19 | 0.07 |
| GW67 | 17/03/2021 | < LOR | 0.07 |
| GW106 | 16/03/2021 | < LOR | 0.07 |
| GW108 | 15/03/2021 | < LOR | 0.07 |
| GW109 | 15/03/2021 | < LOR | 0.07 |
| GW111.1 | 17/03/2021 | 0.17 | 0.07 |
| GW111.2 | 17/03/2021 | < LOR | 0.07 |
| GW111.3 | 17/03/2021 | < LOR | 0.07 |
| GW112.1 | 18/03/2021 | < LOR | 0.07 |
| GW112.2 | 18/03/2021 | 0.73 | 0.07 |

**Surface water samples** (all units µg/L)

| Sample ID | Sampled date | PFOS | Guideline value 90% Ecosystem [2] (PFOS) | Guideline value 95% Ecosystem [2] (PFOS) |
|---|---|---|---|---|
| SW4 | 18/03/2021 | 0.0065 | 2.0 | 0.13 |
| SW33 | 16/03/2021 | 0.09 | 2.0 | 0.13 |
| SW36 | 16/03/2021 | 0.033 | 2.0 | 0.13 |

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**KEY:**

**Above relevant guidelines**

- Groundwater

**Below relevant guidelines**

- Groundwater
- Surface water
- River/Streams/Drains
- RNZAF Base Ohakea Boundary
- <LOR — Below laboratory limit of reporting.
- Concentration Exceeds Relevant Guideline

NOTE:Groundwater wells are not currently used for drinking water supply.

GUIDELINES USED:
1. Interim Guidance Level for Drinking Water (MoH, 2017). Sourced from Australian Government Department of Health - Health Based Guidance Values for PFAS (2017).
2. Draft ANZECC Australian and New Zealand Water Quality Guidelines reported in PFAS National Environmental Management Plan (HEPA 2020).

SOURCE:
Aerial imagery flown 2015-16 and 2019, supplied by NZDF.
Cadastral and Topographic information supplied by LINZ.

| NO. | REVISION HISTORY | DATE |
|---|---|---|
| A | FINAL | JUL 2021 |
| A | ISSUED FOR REVIEW | JUN 2021 |

PROJECT NAME:
RNZAF BASE OHAKEA PFAS INVESTIGATION: LONG TERM MONITORING PLAN

FIGURE TITLE:
SAMPLE EXCEEDENCES MARCH 2021

| SCALE: | FIGURE NO.: | ISSUE NO.: |
|---|---|---|
| 1:30,000 (A3) | 2 | A |

A02744117Z002_SampleExceedences

# Appendix A: Borelogs

PATTLE DELAMORE PARTNERS LTD

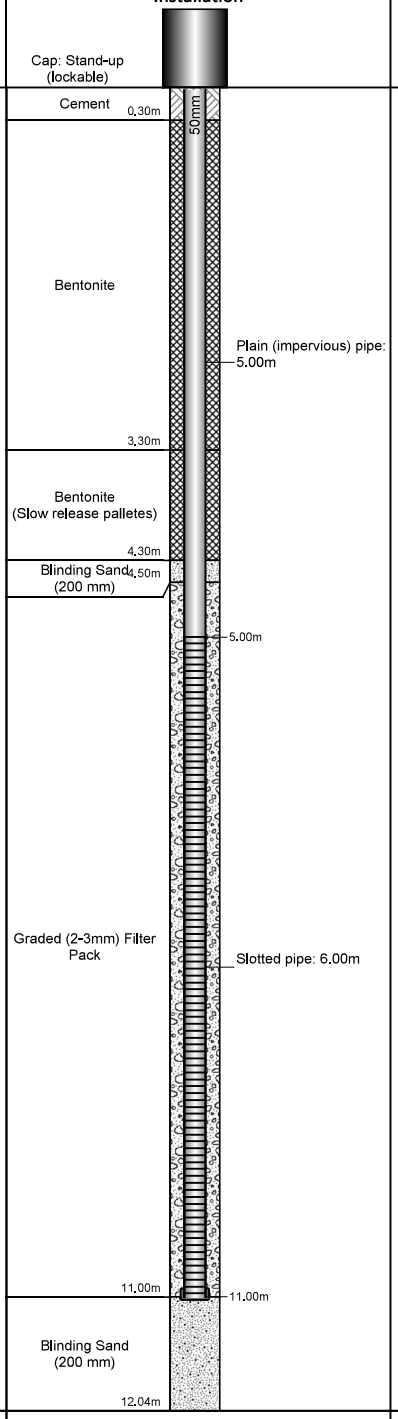
# MONITORING WELL

Job No.: A02744113
Test No.: GW111.1
Sheet: 1 of 1
Date: 01/02/21
Ground Level mRL: Ground

**Client:** New Zealand Defence Force
**Project:** Ohakea PFAS Monitoring Well Installation
**Site Address:** Ohakea
**Coordinates:** 1802841mE, 5545608mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks |
|---|---|---|---|---|---|---|---|
| | Silty SAND; brown . Sand, fine to medium. | | 0 | | | | |
| | SILT, with some sand; brown . Firm, moist, non-plastic; sand, fine. | | 1 | | | | |
| | Silty sandy GRAVEL; brown . Moist, well graded; gravel, fine to coarse, subangular to subround, greywacke; sand, fine to coarse. | | 3 | | | | |
| | Sandy GRAVEL; brown . Moist, well graded; gravel, fine to coarse, subround to subangular, greywacke; sand, fine to coarse. | | 4 | | | | |
| | Silty sandy GRAVEL; brown . Tightly packed. | | 5 | | | | |
| | Silty sandy GRAVEL; brown. Loosely packed, well graded. | | 6 | | | | |
| | Silty sandy GRAVEL; brown. Tightly packed, well graded. | | 7 | | | | |
| | Silty sandy GRAVEL; brown. Loosely packed, well graded. | | 8 | | | | |
| | Sandy gravelly SILT; brown. | | 8 | | | | |
| | SILT, with some sand; brown . Moist; sand, fine. | | 8 | | | | |
| | Sandy gravelly SILT; brown. | | 9 | | | | |
| | Silty sandy GRAVEL; brown. Gravel, fine to medium; sand, fine to coarse. | | 9 | | | | |
| | Silty sandy GRAVEL; brown. Tightly packed; gravel, fine, subround to rounded; sand, fine to coarse. | | 10 | | | | |
| | Silty sandy GRAVEL; brown. | | 10 | | | | |
| | Sandy gravelly SILT; brown. | | 10 | | | | |
| | Silty sandy GRAVEL; brown. Gravel, fine to medium, subangular to rounded; sand, fine to coarse. | | 11 | | | | |
| | GRAVEL; brown. Gravel, medium to coarse. | | 11 | | | | |
| | Sandy GRAVEL; brown. | | 12 | | | | |
| | EOH: 12.04m | | | | | | |

**Installation**




**Water:** Groundwater Not Encountered

**Remarks**
Hand clear to 1.5 am. EOH = End of hole at 12.04 m Borehole as target depth reached.

**Investigation Type**
- ☐ Hand Auger
- ☐ Test Pit
- ☑ Machine Hole

**Water**
- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Geoprobe 8140LS Rotary Sonic | Paul Taulava | TH | EC | 12.04 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

**Job No.:** A02744113
**Test No.:** GW111.2
**Sheet:** 1 of 2
**Date:** 26/01/21
**Ground Level mRL:** Ground

**Client:** New Zealand Defence Force
**Project:** Ohakea PFAS Monitoring Well Installation
**Site Address:** Ohakea
**Coordinates:** 1802841mE, 5545608mN

| Interpretation | Geological Description | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks | Installation | Water |
|---|---|---|---|---|---|---|---|---|---|
| | No sample recovery - wash drilled. | N/R | 5, 10, 15, 20 | | | | | Cap: Stand-up (lockable); Cement 0.30m; 50mm; Plain (impervious) pipe: 36.50m; Grout | 28/01/2021 08:00 |

**Remarks**

EOH = End of hole at 40.92 as target depth reached.

**Investigation Type**

- [ ] Hand Auger
- [ ] Test Pit
- [x] Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Geoprobe 8140LS Rotary Sonic | Paul Taulava | TH | EC | 40.92 m |

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# MONITORING WELL

| | |
|---|---|
| Job No.: | A02744113 |
| Test No.: | GW111.2 |
| Sheet: | 2 of 2 |
| Date: | 26/01/21 |
| Ground Level mRL: | Ground |

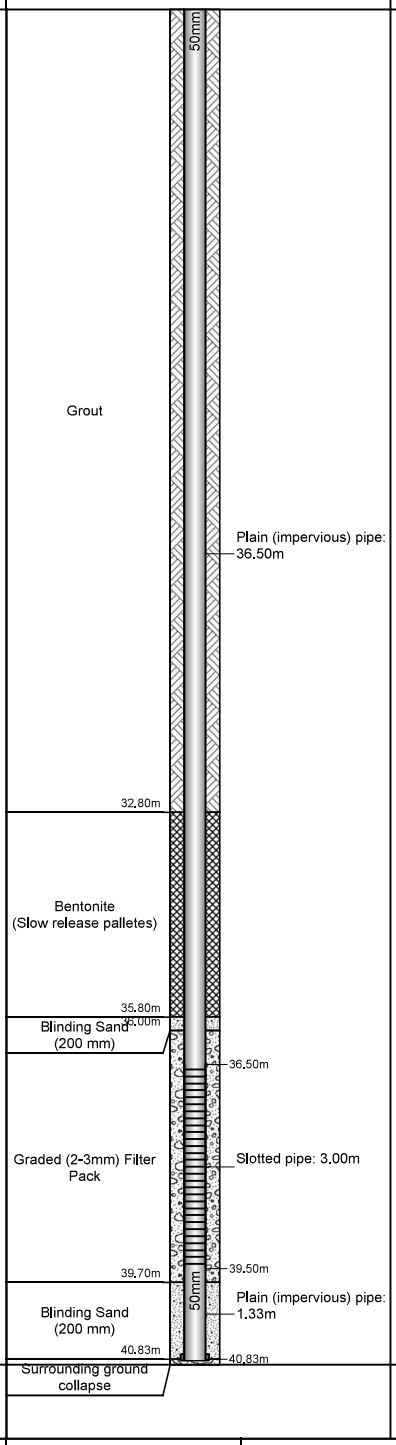
**Client:** New Zealand Defence Force

**Project:** Ohakea PFAS Monitoring Well Installation

**Site Address:** Ohakea

**Coordinates:** 1802841mE, 5545608mN

| Interpretation | Geological Description | Depth (m) | RL (m) | Samples | Depth Remarks |
|---|---|---|---|---|---|
| | Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005. | | | | |
| | [CONT] No sample recovery - wash drilled. | 25 | | | |
| | SILT, with minor sand; blue/grey. Firm - stiff, moist, low plasticity; sand, fine to medium. | 30 | | | |
| | 31.2m - 31.3m: | | | | |
| | 31.6m - 31.8m: | | | | |
| | Alternating SILT some sand with medium to coarse sand lenses and SAND some silt. Blue/grey. | | | | |
| | SILT, with some organics, with minor clay and sand; brown/grey. Firm - stiff, moist, moderate plasticity; sand, fine. | 35 | | | |
| | SILT, with some sand; grey . Sand, medium to coarse; Grading to medium to coarse sand with some silt. | | | | |
| | SAND; black. Soft - firm, moist, poorly graded; sand, medium. | | | | |
| | Sandy GRAVEL; black/grey. Gravel, fine to coarse, subround to rounded, greywacke; sand, fine to coarse. | | | | |
| | SILT & SAND & GRAVEL. Loosely packed; sand, fine to coarse, gravel, fine to medium, subangular to subround. | 40 | | | |
| | SILT, with trace organics; dark grey. Firm, non-plastic. | | | | |
| | EOH: 40.92m | | | | |




| Installation | Water |
|---|---|
| | |

**Remarks**

EOH = End of hole at 40.92 as target depth reached.

**Investigation Type**

- ☐ Hand Auger
- ☐ Test Pit
- ☑ Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Geoprobe 8140LS Rotary Sonic | Paul Taulava | TH | EC | 40.92 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

**Job No.:** A02744113
**Test No.:** GW111.3
**Sheet:** 1 of 5
**Date:** 19/01/21
**Ground Level mRL:** Ground

**Client:** New Zealand Defence Force
**Project:** Ohakea PFAS Monitoring Well Installation
**Site Address:** Ohakea
**Coordinates:** 1802841mE, 5545608mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks |
|---|---|---|---|---|---|---|---|
| | SILT, with some sand; dark brown. Firm, non-plastic; sand, fine to medium. | | | | | | |
| | SAND, with some silt; light brown with grey/orange mottles. Loose, moist, non-plastic, poorly graded; sand, fine to medium. | | | | | | |
| | SILT, with some sand; light brown. Firm, non-plastic; sand, fine. | | | | | | |
| | GRAVEL, with trace cobbles; dark grey. Loosely packed; gravel, fine to coarse, rounded to subround, unweathered to slightly weathered, greywacke. | | 5 | | | | |
| | SILT, with some sand and gravel; light brown . Tightly packed; sand, fine to medium, gravel, fine to coarse, rounded to subround, unweathered to slightly weathered, greywacke. | | | | | | |
| | GRAVEL, with some sand; grey to dark grey. Well graded; gravel, fine to coarse, subround to rounded, unweathered to slightly weathered, greywacke; sand, fine to medium. | | | | | | |
| | GRAVEL, with minor cobbles; grey to dark grey. Well graded; gravel, fine to coarse, subround to rounded, unweathered to slightly weathered, greywacke; cobbles, subround to rounded, up to 80mm, unweathered to slightly weathered, greywacke. | | 10 | | | | |
| | Sandy SILT, with minor organics and gravel, with trace clay; mottled grey brown. Firm - stiff, moist, low plasticity; sand, fine to medium; gravel, fine to coarse, rounded, greywacke. | | | | | | |
| | SILT, with some sand; mottled grey/brown. Stiff, moist, low plasticity; sand, fine to medium. | | | | | | |
| | SILT, with some sand; blue/grey. Stiff, moist, low plasticity; sand, fine to medium. | | | | | | |
| | SILT, with minor sand; brown . Firm, non-plastic; sand, fine. | | 15 | | | | |
| | SILT, with minor sand; grey . Firm, non-plastic; sand, fine. | | | | | | |
| | Silty SAND; brown . Firm, non-plastic; sand, fine to coarse. | | | | | | |
| | SAND, with minor silt; greyish brown. Stiff, non-plastic; sand, medium to coarse. | | | | | | |
| | SILT, with minor sand; blue/grey. Stiff, low plasticity; sand, medium. | | | | | | |
| | GRAVEL, with some cobbles; grey . Well graded; gravel, fine to coarse, subround to rounded, unweathered to slightly weathered; cobbles, subround to rounded, up to 90mm, unweathered to slightly weathered. | | | | | | |

**Installation**

Cap: Stand-up (lockable)
Cement 0.30m
50mm
Grout
Plain (impervious) pipe: 78.00m

**Water**

14/02/2021 17:30
21/01/2021 08:30
20/01/2021 17:02
18/02/2021 14:18
20/01/2021 08:15
19/01/2021 17:40
18/02/2021 14:35
22/01/2021 08:45
22/01/2021 10:45
21/01/2021 18:02
17/02/2021 08:00

**Remarks**

Hand clear to 1.4. EOH at 94.5 m as target depth reached. Geoprobe 8140LS Rotary Sonic to 53.08 m then Dual Foremost Air Rotary to EOH.

**Investigation Type**

- ☐ Hand Auger
- ☐ Test Pit
- ☑ Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Rotary Sonic / Dual Rotary | Kortney Morris/ Andy Gibellini | TH | EC | 94.50 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

**Job No.:** A02744113
**Test No.:** GW111.3
**Sheet:** 2 of 5
**Date:** 19/01/21
**Ground Level mRL:** Ground

**Client:** New Zealand Defence Force
**Project:** Ohakea PFAS Monitoring Well Installation
**Site Address:** Ohakea
**Coordinates:** 1802841mE, 5545608mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks | Installation | Water |
|---|---|---|---|---|---|---|---|---|---|
| | [CONT] GRAVEL, with some cobbles; grey . Well graded; gravel, fine to coarse, subround to rounded, unweathered to slightly weathered; cobbles, subround to rounded, up to 90mm, unweathered to slightly weathered. | | | | | | | 50mm | |
| | GRAVEL, with some sand and cobbles; grey . Well graded; gravel, fine to coarse, subround to rounded, unweathered to slightly weathered; sand, coarse, cobbles, subround to rounded, up to 90mm, unweathered to slightly weathered; Sand is matrix. | | | | | | | | |
| | SILT & SAND, with some organics; dark grey. Firm - stiff, moist; sand, fine; Alternating sequence of SILT with fine sand and fine SAND with some silt. | | 25 | | | | | | |
| | | | 30 | | | | | Grout | Plain (impervious) pipe: 78.00m |
| | SILT, with some sand; blue grey. Firm - stiff, moist, low plasticity; sand, fine. | | | | | | | | |
| | SILT, with some organics, with trace sand; grey to dark brown. Firm, moist, moderate plasticity; wood; sand, fine. | | | | | | | | |
| | SAND, with trace silt; blue grey. Tightly packed, moist, poorly graded; sand, fine. | | | | | | | | |
| | SAND, with trace silt; blue grey/black. Soft - firm, moist, poorly graded; sand, medium. | | 35 | | | | | | |
| | Sandy GRAVEL; dark grey. Well graded; gravel, fine to coarse, subround to rounded, unweathered to slightly weathered, greywacke; sand, fine to medium. | | | | | | | | |

**Remarks**

Hand clear to 1.4. EOH at 94.5 m as target depth reached. Geoprobe 8140LS Rotary Sonic to 53.08 m then Dual Foremost Air Rotary to EOH.

**Investigation Type**

- ☐ Hand Auger
- ☐ Test Pit
- ☑ Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Rotary Sonic / Dual Rotary | Kortney Morris/ Andy Gibellini | TH | EC | 94.50 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

**Job No.:** A02744113
**Test No.:** GW111.3
**Sheet:** 3 of 5
**Date:** 19/01/21
**Ground Level mRL:** Ground

**Client:** New Zealand Defence Force
**Project:** Ohakea PFAS Monitoring Well Installation
**Site Address:** Ohakea
**Coordinates:** 1802841mE, 5545608mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks | Installation | Water |
|---|---|---|---|---|---|---|---|---|---|
| | SAND, with some silt; dark blue grey. | | | | | | | | |
| | SILT, with some organics and sand. | | | | | | | | |
| | SAND, with minor silt. Sand, fine. | | | | | | | | |
| | SILT, with minor organics and clay, with trace sand; blue grey to brown. Firm - hard; wood; sand, fine. | | | | | | | | |
| | SAND, with some organics, with minor silt; blue grey. Firm, moist; sand, fine; wood. | | 45 | | | | | | |
| | SILT, with some organics, with trace sand; blue/grey. Sand, fine. | | | | | | | | |
| | PEAT (FIBROUS), with some silt and sand; black. Soft - stiff, moist; sand, fine to medium. | | | | | | | | |
| | No recovery. | | | | | | | | |
| | SAND; dark grey to blue grey. Soft - firm, moist, poorly graded; sand, medium. | | 50 | | | | | Grout | |
| | 52.2m - 52.3m: With trace gravel. Gravel, rounded, greywacke. | | | | | | | | |
| | SAND, with trace gravel. Sand, fine to medium. | | 55 | | | | | | |
| | GRAVEL, with some sand. Gravel, subround to rounded, greywacke. | | | | | | | | |
| | SAND, with some gravel. Sand, fine to coarse; gravel, subround to rounded. | | | | | | | | |

50mm

Plain (impervious) pipe: 78.00m

**Remarks**

Hand clear to 1.4. EOH at 94.5 m as target depth reached. Geoprobe 8140LS Rotary Sonic to 53.08 m then Dual Foremost Air Rotary to EOH.

**Investigation Type**

- ☐ Hand Auger
- ☐ Test Pit
- ☑ Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Rotary Sonic / Dual Rotary | Kortney Morris/ Andy Gibellini | TH | EC | 94.50 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

| | |
|---|---|
| **Job No.:** | A02744113 |
| **Test No.:** | GW111.3 |
| **Sheet:** | 4 of 5 |
| **Date:** | 19/01/21 |
| **Ground Level mRL:** | Ground |

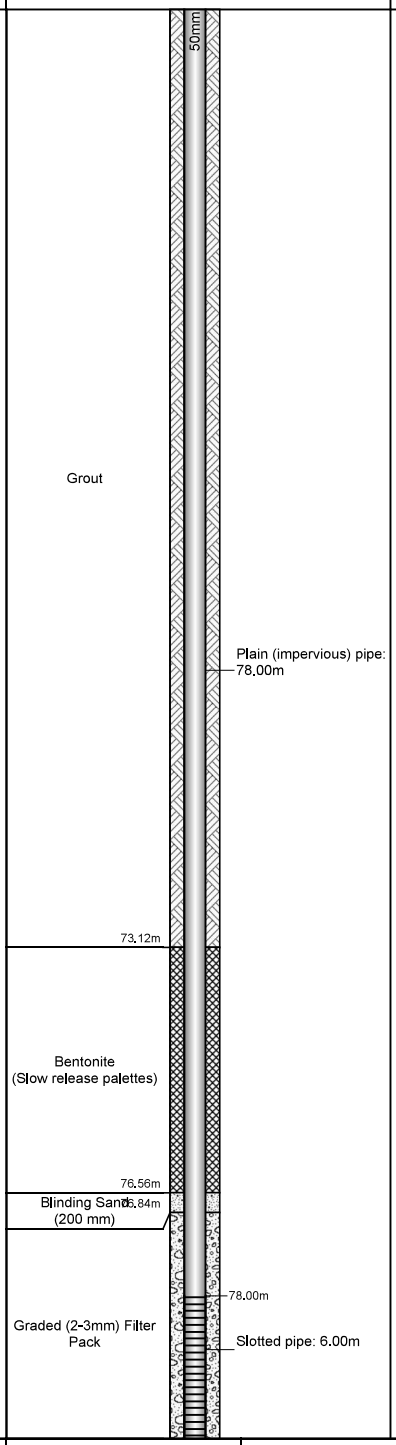
**Client:** New Zealand Defence Force

**Project:** Ohakea PFAS Monitoring Well Installation

**Site Address:** Ohakea

**Coordinates:** 1802841mE, 5545608mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks |
|---|---|---|---|---|---|---|---|
| | SAND & GRAVEL. Sand, fine to coarse, gravel, fine to medium, subround to rounded. | | | | | | |
| | SAND, with some gravel. Sand, fine to coarse; gravel, fine to medium, subround to rounded. | | | | | | |
| | SAND, with minor gravel, with trace shell fragments. Sand, fine to medium. | | | | | | |
| | SAND & GRAVEL, with minor shell fragments. Sand, fine to coarse, gravel, fine to medium. | | | | | | |
| | SAND, with some shells fragments, with trace gravel. Sand, fine to coarse; gravel, fine. | | | | | | |
| | GRAVEL, with some shells, with minor sand. Gravel, subround to rounded; sand, medium to coarse. | | 65 | | | | |
| | SAND, with minor shells and gravel. Sand, fine to coarse; gravel, fine. | | | | | | |
| | SAND, with some shells and gravel. Sand, fine to coarse; gravel, fine to medium. | | | | | | |
| | SAND, with trace shells and silt and gravel. Sand, fine to coarse; gravel, fine to medium. | | 70 | | | | |
| | SAND, with trace silt and gravel. Sand, fine to coarse; gravel, fine. | | | | | | |
| | No recovery. | | 75 | | | | |
| | SAND, with some shells and gravel. Sand, fine to coarse; gravel, fine; minor organics. | | | | | | |




**Installation**

**Water**

**Remarks**

Hand clear to 1.4. EOH at 94.5 m as target depth reached. Geoprobe 8140LS Rotary Sonic to 53.08 m then Dual Foremost Air Rotary to EOH.

**Investigation Type**

- ☐ Hand Auger
- ☐ Test Pit
- ☑ Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Rotary Sonic / Dual Rotary | Kortney Morris/ Andy Gibellini | TH | EC | 94.50 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

**Job No.:** A02744113
**Test No.:** GW111.3
**Sheet:** 5 of 5
**Date:** 19/01/21
**Ground Level mRL:** Ground

**Client:** New Zealand Defence Force
**Project:** Ohakea PFAS Monitoring Well Installation
**Site Address:** Ohakea
**Coordinates:** 1802841mE, 5545608mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks | Installation | Water |
|---|---|---|---|---|---|---|---|---|---|
| | [CONT] SAND, with some shells and gravel. Sand, fine to coarse; gravel, fine; minor organics. | | | | | | | Graded (2-3mm) Filter Pack; Slotted pipe: 6.00m; 84.00m; 84.00m; Blinding Sand (200 mm) 84.30m | |
| | SILT, with minor sand. | | 85 | | | | | Bentonite (Slow release palettes) 85.30m | |
| | SILT, with some sand. | | 90 | | | | | Gravel; 93.50m; Bentonite (Slow release palettes) 94.50m | |
| | EOH: 94.50m | | 95 | | | | | | |

**Remarks**

Hand clear to 1.4. EOH at 94.5 m as target depth reached. Geoprobe 8140LS Rotary Sonic to 53.08 m then Dual Foremost Air Rotary to EOH.

**Investigation Type**

- [ ] Hand Auger
- [ ] Test Pit
- [x] Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Rotary Sonic / Dual Rotary | Kortney Morris/ Andy Gibellini | TH | EC | 94.50 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

**Job No.:** A02744113
**Test No.:** GW112.1
**Sheet:** 1 of 1
**Date:** 02/02/21
**Ground Level mRL:** Ground

**Client:** New Zealand Defence Force
**Project:** Ohakea PFAS Monitoring Well Installation
**Site Address:** Ohakea
**Coordinates:** 1802074mE, 5544625mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Depth (m) |
|---|---|---|
| | SILT, with some rootlets; brown with orange mottling. Moist, low plasticity. | 0.00 |
| | SILT; grey/mottled orange. Moist, moderate plasticity. | 0.50 |
| | Silty GRAVEL, with some cobbles; grey/mottled orange. Moist; gravel, fine to coarse, subround to rounded, Greywacke; cobbles, subround to rounded, Greywacke. | 1.00 |
| | Silty sandy GRAVEL; brown . Wet; gravel, fine to medium, subround to rounded, Greywacke; sand, fine to coarse. | 2.00 |
| | Silty sandy GRAVEL; brown/grey . Gravel, fine to medium, subround to rounded, Greywacke; sand, fine to coarse. | 3.00 |
| | Silty GRAVEL; brown/grey. Wet; gravel, fine to coarse, subround to rounded, Greywacke. | 3.30 |
| | Silty sandy GRAVEL, with minor cobbles; brown/grey. Wet, well graded; gravel, fine to coarse, subround to rounded, Greywacke; sand, fine to coarse; cobbles, subround to rounded, Greywacke; Cobbles from 4.6 m to 5.1 m. | 4.00 |
| | GRAVEL, with trace silt; grey . Wet, well graded; gravel, fine to coarse, subangular to subround, Greywacke. | 9.00 |
| | Silty sandy GRAVEL. Moist; gravel, fine to medium, subangular to subround; sand, fine to coarse. | 9.70 |
| | Gravelly SILT; brown/mottled grey. Soft, moist; gravel, fine to medium, subround to rounded. | 10.00 |
| | SILT, with minor gravel; brown/grey/mottled orange. Firm - stiff, moist; gravel, fine, subround to rounded. | 11.00 |
| | Sandy SILT; blue/green/grey. Wet. | 12.00 |
| | SILT; brown/grey/blue. Firm - stiff, moderate plasticity. | 13.00 |
| | EOH: 15.08m | 15.08 |

**Installation**

Cap: Stand-up (lockable)
Cement 0.30m
Bentonite 0.50m
50mm
Bentonite (Slow release palletes) 3.00m
Plain (impervious) pipe: 3.50m
Blinding Sand (200mm) 3.30m
3.50m
Graded (2-3mm) Filter Pack 9.70m
Slotted pipe: 6.00m
Plain (impervious) pipe: 0.30m
9.80m
Blinding Sand (200mm) 10.00m
Bentonite (Slow release palletes) 15.08m

**Water**
02/02/2021 00:00

**Remarks**
Hand clear to 1.2 m. EOH at 15.08 m as target depth reached.

**Investigation Type**
- [ ] Hand Auger
- [ ] Test Pit
- [x] Machine Hole

**Water**
- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Geoprobe 8140LS Rotary Sonic | Paul Taulava | TH | EC | 15.08 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

| | |
|---|---|
| Job No.: | A02744113 |
| Test No.: | GW112.2 |
| Sheet: | 1 of 3 |
| Date: | 04/02/21 |
| Ground Level mRL: | Ground |

**Client:** New Zealand Defence Force

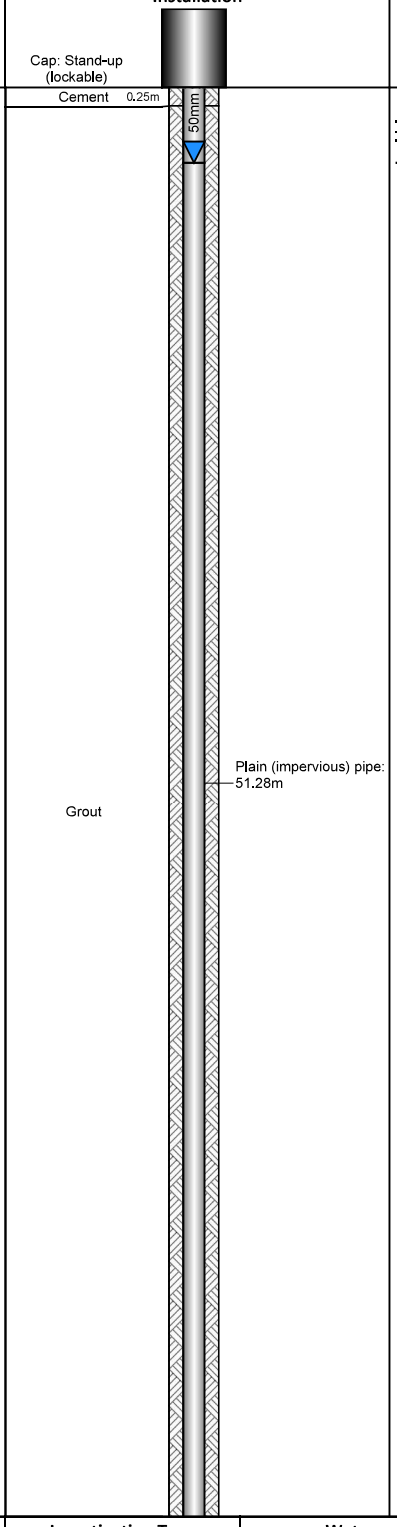
**Project:** Ohakea PFAS Monitoring Well Installation

**Site Address:** Ohakea

**Coordinates:** 1802074mE, 5544625mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Depth (m) | RL (m) | Graphic Log | PID (ppm) | Samples | Depth Remarks |
|---|---|---|---|---|---|---|---|
| | SILT; brown with orange mottling. Moist, low plasticity; Rootlets present. | 0 | | | | | |
| | SILT; grey/mottled orange. Moist, moderate plasticity. | 1 | | | | | |
| | GRAVEL, with minor cobbles. Gravel, fine to coarse, subround to subangular, Greywacke; cobbles, subround to subangular, Greywacke. | 2 | | | | | |
| | Silty sandy GRAVEL; brown. Wet; gravel, fine to medium, Greywacke; sand, fine to coarse. | 3 | | | | | |
| | Silty sandy GRAVEL; grey. Wet; gravel, fine to medium, Greywacke; sand, fine to coarse. | 4 | | | | | |
| | Silty sandy GRAVEL; brown. Wet; gravel, fine to medium, Greywacke; sand, fine to coarse. | 5 | | | | | |
| | | 6 | | | | | |
| | | 7 | | | | | |
| | | 8 | | | | | |
| | | 9 | | | | | |
| | Sandy gravelly SILT. | 10 | | | | | |
| | SILT; mottled brown and grey. Firm - stiff, moist. | 11 | | | | | |
| | SILT; grey. Soft - firm, moist. | 12 | | | | | |
| | Sandy SILT; brown. Moist; sand, fine. | 13 | | | | | |
| | SILT; grey. Firm - stiff, moist. | 14 | | | | | |
| | | 15 | | | | | |
| | Sandy SILT; black/grey. Soft - firm, moist. | 16 | | | | | |
| | SILT; grey/brown. Firm - stiff, moist. | 17 | | | | | |
| | Silty SAND. Firm, wet; sand, fine. | 18 | | | | | |
| | SILT; grey/brown. Firm - stiff, moist. | | | | | | |

**Installation**




**Water**

11/01/2021 08:00
12/02/2021 09:00
13/02/2021 08:00
12/02/2021 14:00

**Remarks**

Hand clear to 1.2 m. EOH at 54.28 m as target depth reached

**Investigation Type**

- ☐ Hand Auger
- ☐ Test Pit
- ☑ Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Geoprobe 8140LS Rotary Sonic | Brain McMahon / Paul Taulava | TH | EC | 54.28 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

**Job No.:** A02744113
**Test No.:** GW112.2
**Sheet:** 2 of 3
**Date:** 04/02/21
**Ground Level mRL:** Ground

**Client:** New Zealand Defence Force
**Project:** Ohakea PFAS Monitoring Well Installation
**Site Address:** Ohakea
**Coordinates:** 1802074mE, 5544625mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks | Installation | Water |
|---|---|---|---|---|---|---|---|---|---|
| | [CONT] SILT; grey/brown. Firm - stiff, moist. | | 20 | | | | | | |
| | | | 21 | | | | | | |
| | | | 22 | | | | | | |
| | Silty SAND; grey/black. Firm - stiff, moist. | | 23 | | | | | | |
| | SILT; grey. Firm - stiff, moist. | | 24 | | | | | | |
| | | | 25 | | | | | | |
| | | | 26 | | | | | | |
| | | | 27 | | | | | | |
| | Silty SAND; blue grey. Firm - stiff, moist; sand, fine to medium. | | 28 | | | | | | |
| | | | 29 | | | | | | |
| | | | 30 | | | | | | |
| | SAND; dark grey. Firm, moist; sand, medium. | | 31 | | | | | | |
| | SILT, with some organics, with minor sand; grey/blue grey. Stiff; sand, fine. | | 32 | | | | | | |
| | | | 33 | | | | | | |
| | | | 34 | | | | | | |
| | | | 35 | | | | | | |
| | | | 36 | | | | | | |
| | Silty SAND, with some organics. Soft - stiff, moist; sand, fine; Some fine to medium sand lenses up to 200mm. | | 37 | | | | | | |

Installation: 50mm; Grout; Plain (impervious) pipe: 51.28m

**Remarks**
Hand clear to 1.2 m. EOH at 54.28 m as target depth reached

**Investigation Type**
- [ ] Hand Auger
- [ ] Test Pit
- [x] Machine Hole

**Water**
- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Geoprobe 8140LS Rotary Sonic | Brain McMahon / Paul Taulava | TH | EC | 54.28 m |

PATTLE DELAMORE PARTNERS LTD

# MONITORING WELL

| | |
|---|---|
| Job No.: | A02744113 |
| Test No.: | GW112.2 |
| Sheet: | 3 of 3 |
| Date: | 04/02/21 |
| Ground Level mRL: | Ground |

**Client:** New Zealand Defence Force

**Project:** Ohakea PFAS Monitoring Well Installation

**Site Address:** Ohakea

**Coordinates:** 1802074mE, 5544625mN (NZTM)

| Interpretation | Geological Description (Soil and Rock logged in accordance with New Zealand Geotechnical Society field description of soil and rock. 2005.) | Graphic Log | Depth (m) | RL (m) | PID (ppm) | Samples | Depth Remarks | Installation | Water |
|---|---|---|---|---|---|---|---|---|---|
| | [CONT] Silty SAND, with some organics. Soft - stiff, moist; sand, fine; Some fine to medium sand lenses up to 200mm. | | 39 40 41 | | | | | Grout | |
| | SILT, with some organics, with trace sand; grey. Firm - stiff; sand, fine. | | 42 | | | | | | |
| | 42.2m - 42.4m: Cemented silt. | | 42 43 | | | | | | |
| | SAND, with some wood; dark grey. Tightly packed, moist, poorly graded; sand, fine to medium, Unweathered. | | 44 45 | | | | | 44.00m | |
| | SAND, with some wood and gravel; dark grey. Moist, poorly graded; sand, medium to coarse; gravel, fine, subround to rounded, Greywacke. | | 46 47 | | | | | Bentonite (Slow release pallettes) | |
| | SILT, with minor organics; grey. Firm - stiff, moist, non-plastic. | | 48 | | | | | 48.70m | |
| | Organic SILT, with trace sand; dark grey to black. Firm - stiff, dry to moist, non-plastic; sand, fine. | | 48 | | | | | Blinding Sand (200 mm) | |
| | SAND, with trace gravel; dark grey. Moist; sand, fine to coarse; gravel, fine. | | 49 50 | | | | | | |
| | 51.1m - 51.3m: Gravelly SAND, with some shells; grey. | | 51 | | | | | Graded (2-3mm) Filter Pack | |
| | SAND, with some shell fragments, with minor gravel; grey. Firm, moist; sand, fine; gravel, fine to medium, subround to rounded, Greywacke. | | 52 | | | | | | |
| | Sandy GRAVEL, with some shell fragments; grey. Moist; gravel, fine to coarse, subround to rounded, greywacke; sand, fine to coarse. | | 53 | | | | | | |
| | SAND, with minor shell fragments, with trace gravel; grey. Tightly packed, poorly graded; sand, fine; gravel, fine to medium, subround to rounded, Greywacke. | | 54 | | | | | 54.28m | |
| | SAND & GRAVEL, with some shell fragments. Sand, fine to coarse, gravel, fine to medium, subround to rounded, greywacke. EOH: 54.28m | | 55 56 | | | | | | |

Installation: 50mm; Plain (impervious) pipe: 51.28m; 51.28m; Slotted pipe: 3.00m; 54.28m; 54.28m

**Remarks**

Hand clear to 1.2 m. EOH at 54.28 m as target depth reached

**Investigation Type**

- [ ] Hand Auger
- [ ] Test Pit
- [x] Machine Hole

**Water**

- Standing Water Level
- In flow
- Out flow

| Contractor: | Rig/Plant Used: | Driller: | Logged By: | Checked By: | Hole Depth: |
|---|---|---|---|---|---|
| McMillan Drilling | Geoprobe 8140LS Rotary Sonic | Brain McMahon / Paul Taulava | TH | EC | 54.28 m |

# Appendix B: Laboratory Reports and Chain of Custody Forms

AsureQuality Limited | 1C Quadrant Drive | Waiwhetu | Lower Hutt 5010 | Wellington | New Zealand
PO Box 31242 | Lower Hutt 5040 | Wellington | New Zealand
t. +64 4 570 8800 | e. cswellington@asurequality.com | w. www.asurequality.com

# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 29-Mar-2021 **AsureQuality Reference: 21-78139** **Sample(s) Received:** 16-Mar-2021 08:40

**Testing Period:** 16-Mar-2021 to 29-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW108_2_150321 **Lab ID:** 21-78139-1

**Sample Condition**: Acceptable **Sampled Date**: 15-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.0011 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 124 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 144 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 136 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 81 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 112 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 113 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 151 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 141 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 126 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 144 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 136 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 175 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 410 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 99 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 39 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 40 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 121 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 73 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 91 | % | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 161 (R) | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 134 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 129 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 97 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_ADJ_GWKAL_1_150321 **Lab ID:** 21-78139-2

**Sample Condition**: Acceptable **Sampled Date**: 15-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 115 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 107 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 88 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 122 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 122 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 117 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 125 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 104 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 85 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 40 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 50 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 61 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 88 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 32 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 43 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 74 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 35 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 55 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 120 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 119 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 88 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 111 | % | AsureQuality Method (LC-MS/MS) |

**Customer Sample Name:** OHA_ADJ_GWKAM_1_150321 **Lab ID:** 21-78139-3

**Sample Condition**: Acceptable **Sampled Date**: 15-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Internal Standards** | | | |
| M3PFBS | 79 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 63 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 50 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 85 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 76 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 67 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 53 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 51 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 29 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 35 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 0 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 37 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 47 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 41 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 35 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 46 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 25 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 33 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 96 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 81 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 53 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 90 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_ADJ_GWKAN_1_150321 **Lab ID:** 21-78139-4

**Sample Condition**: Acceptable **Sampled Date**: 15-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 108 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 118 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 104 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 109 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 202 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 307 (R) | % | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| MPFOSA | 130 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 465 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 211 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 133 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 121 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 206 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 233 (R) | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 85 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-78139-1, 21-78139-2, 21-78139-3, 21-78139-4

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 100 | % | AsureQuality Method (LC-MS/MS) |

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | NR µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | NR µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

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# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 29-Mar-2021 **AsureQuality Reference: 21-78157** **Sample(s) Received:** 16-Mar-2021 08:40

**Testing Period:** 16-Mar-2021 to 29-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW109_2_150321 **Lab ID:** 21-78157-1

**Sample Condition**: Acceptable **Sampled Date**: 15-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 116 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 154 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 144 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 108 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 131 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 145 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 128 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 134 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 191 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 360 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 220 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 146 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 513 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 258 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 181 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 153 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 272 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 272 (R) | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 118 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 123 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 150 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 103 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-78157-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 100 | % | AsureQuality Method (LC-MS/MS) |

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | NR µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | NR µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | NR µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 29-Mar-2021 **AsureQuality Reference: 21-78166** **Sample(s) Received:** 16-Mar-2021 08:40

**Testing Period:** 16-Mar-2021 to 29-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW65_5_150321 **Lab ID:** 21-78166-1

**Sample Condition**: Acceptable **Sampled Date**: 15-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 116 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 98 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 113 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 129 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 124 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 114 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 109 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 185 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 792 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 102 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 160 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 74 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 87 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 130 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 175 (R) | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 126 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 127 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 100 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-78166-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 100 | % | AsureQuality Method (LC-MS/MS) |

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | NR µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | NR µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744117**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 29-Mar-2021 **AsureQuality Reference: 21-79168** **Sample(s) Received:** 17-Mar-2021 08:40

**Testing Period:** 17-Mar-2021 to 29-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW6_6_160321 **Lab ID:** 21-79168-1

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | 0.0016 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.0023 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.0031 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.0035 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.014 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.018 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.0038 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.0043 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.0081 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.026 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.011 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.0072 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.0030 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.0031 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 135 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 160 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 162 (R) | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 44 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 65 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 67 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 93 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 115 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 132 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 203 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 382 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 1310 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 109 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 515 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 246 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 159 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 134 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 234 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 179 (R) | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 333 (R) | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 320 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 185 (R) | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 48 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-79168-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 100 | % | AsureQuality Method (LC-MS/MS) |

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | NR µg/L |
| PFDoDA | NR µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | NR µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | NR µg/L |
| 6:2 FTS | NR µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | NR µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 31-Mar-2021 **AsureQuality Reference: 21-79471** **Sample(s) Received:** 17-Mar-2021 08:40

**Testing Period:** 17-Mar-2021 to 31-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW31_5_160321 **Lab ID:** 21-79471-1

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | 0.0042 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFBS | 0.011 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFPeS | 0.0096 | µg/L | AsureQuality Method ( LC-MS/MS) |
| di-PFHxS ( 1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.017 | µg/L | AsureQuality Method ( LC-MS/MS) |
| L-PFHxS (1) | 0.073 | µg/L | AsureQuality Method ( LC-MS/MS) |
| Total PFHxS ( 3) | 0.090 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFHpS | 0.0016 | µg/L | AsureQuality Method ( LC-MS/MS) |
| di-PFOS (5) | 0.0034 | µg/L | AsureQuality Method ( LC-MS/MS) |
| mono-PFOS (5) | 0.037 | µg/L | AsureQuality Method ( LC-MS/MS) |
| L-PFOS ( 5) | 0.028 | µg/L | AsureQuality Method ( LC-MS/MS) |
| Total PFOS (7) | 0.068 | µg/L | AsureQuality Method ( LC-MS/MS) |
| Sum PFHxS+PFOS ( 1) | 0.16 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.060 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFPeA | 0.25 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFHxA | 0.17 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFHpA | 0.063 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFOA | 0.025 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFNA | 0.0076 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method ( LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| 6:2 FTS | 0.0052 | µg/L | AsureQuality Method ( LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 102 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 89 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 95 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 96 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 108 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 93 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 92 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 89 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 66 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 91 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 42 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 43 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 86 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 60 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 75 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 145 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 118 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 94 | % | AsureQuality Method (LC-MS/MS) |

## QC Results

### Blank

Relates to sample(s) 21-79471-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS ( 1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS ( 3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS ( 5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS ( 1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| | | | |
|---|---|---|---|
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M7PFHpA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 125 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 120 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 126 | % | AsureQuality Method (LC-MS/MS) |
| M2PFDoDA | 168 (R) | % | AsureQuality Method (LC-MS/MS) |
| M2PFTeDA | 159 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8PFOSA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 119 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 115 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 158 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 125 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 125 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 106 | % | AsureQuality Method (LC-MS/MS) |

R= Recovery outside method limits

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS ( 1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS ( 3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS ( 5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS ( 1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | 0.0010 µg/L |
| NMeFOSA-M | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.0010 µg/L |
| NMeFOSE-M | 0.0010 µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS ( 1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS ( 5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4 -ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 31-Mar-2021 **AsureQuality Reference: 21-79480** **Sample(s) Received:** 17-Mar-2021 08:40

**Testing Period:** 17-Mar-2021 to 31-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW53_5_160321 **Lab ID:** 21-79480-1

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 102 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 111 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 104 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 94 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 104 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 115 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 89 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 84 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 0 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 73 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 81 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 64 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 79 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 99 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 96 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 116 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 114 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 82 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-79480-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 105 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 125 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 120 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 126 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 168 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 159 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 119 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 115 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 158 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 125 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 125 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 106 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | 0.0010 µg/L |
| NMeFOSA-M | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.0010 µg/L |
| NMeFOSE-M | 0.0010 µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 31-Mar-2021 **AsureQuality Reference: 21-79484** **Sample(s) Received:** 17-Mar-2021 08:40

**Testing Period:** 17-Mar-2021 to 31-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW106_1_160321 **Lab ID:** 21-79484-1

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFBS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS ( 1) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS ( 3) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| L-PFOS ( 5) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS ( 1) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/ L | AsureQuality Method ( LC-MS/MS) |
| PFECHS * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/L | AsureQuality Method ( LC-MS/MS) |
| PFPeA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/ L | AsureQuality Method ( LC-MS/MS) |
| PFTeDA | NR | µg/ L | AsureQuality Method ( LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method ( LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 107 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 115 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 77 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 93 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 99 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 112 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 115 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 107 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 96 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 46 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 109 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 58 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 83 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 92 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 98 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 105 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 177(R) | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 139 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 127 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 97 | % | AsureQuality Method (LC-MS/MS) |

R= Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-79484-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS ( 1) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS ( 3) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| L-PFOS ( 5) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS ( 1) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/ L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/ L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSAA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FHxPA (3:3FTA) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| FHpPA (5:3FTA) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/ L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 105 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 125 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 120 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 126 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 168 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 159 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 119 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 115 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 158 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 125 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 125 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 106 | % | AsureQuality Method (LC-MS/MS) |

R= Recovery outside method limits

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUI TE_B | AsureQuality Method (LC-MS/MS) | I ANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined usinga branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined usinga branched mono-PFOS isomer standard (499>8 0 transition)
L-PFOS (5) = Concentration determined usingthe linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS ( 1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS ( 3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS ( 5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS ( 1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | 0.0010 µg/L |
| NMeFOSA-M | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.0010 µg/L |
| NMeFOSE-M | 0.0010 µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS ( 1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS ( 5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (maj or + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUdA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744115**
**Amended Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 11-May-2021 **AsureQuality Reference: 21-79491** **Sample(s) Received:** 17-Mar-2021 08:40

**Testing Period:** 17-Mar-2021 to 31-Mar-2021
Date of analysis is available on request.

## Comments

Amended Report: Sample Name amended.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_SW36_5_160321 **Lab ID:** 21-79491-1

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.0017 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.0019 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.0030 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.018 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.021 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.017 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.016 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.033 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.054 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.019 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.072 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.026 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.012 | µg/L | AsureQuality Method (LC-MS/MS) |



  

**Report Number 2370192 cancels Report Number 2316427.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFNA | 0.0048 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 133 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 88 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 118 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 117 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 108 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 131 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 229 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 511 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 117 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 108 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 131 | % | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2370192 cancels Report Number 2316427.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| DNMeFOSAA | 109 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 165 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 136 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 197 (R) | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 163 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 128 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 86 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-79491-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2370192 cancels Report Number 2316427.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 105 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 125 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 120 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 126 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 168 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 159 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 119 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 115 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 158 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 125 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 125 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 106 | % | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2370192 cancels Report Number 2316427.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|

R = Recovery outside method limits

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | 0.0010 µg/L |
| NMeFOSA-M | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.0010 µg/L |
| NMeFOSE-M | 0.0010 µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

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| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

**Report Number 2370192 cancels Report Number 2316427.**

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

**Report Number 2370192 cancels Report Number 2316427.**

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# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 31-Mar-2021 **AsureQuality Reference: 21-79499** **Sample(s) Received:** 17-Mar-2021 08:40

**Testing Period:** 17-Mar-2021 to 31-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_SW33_5_160321 **Lab ID:** 21-79499-1

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | 0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.0062 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.0058 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.0088 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.049 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.058 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | 0.0013 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | 0.0021 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.036 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.052 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.090 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.15 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.043 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.13 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.054 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.021 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.0092 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 98 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 119 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 128 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 82 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 91 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 93 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 118 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 120 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 104 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 134 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 222 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 402 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 126 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 165 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 138 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 131 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 177 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 147 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 200 (R) | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 145 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 135 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 99 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_ADJ_GWKAO_1_160321 **Lab ID:** 21-79499-2

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 126 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 99 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 117 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 131 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 126 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 164 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 194 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 105 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 133 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 108 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 115 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 132 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 130 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 197 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 171 (R) | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 125 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 140 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 96 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_ADJ_GWKAP_1_160321 **Lab ID:** 21-79499-3

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 116 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 107 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 78 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 57 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 72 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 20 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 86 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 165 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 76 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 75 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 81 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 68 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 95 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 114 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 113 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 83 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** Duplicate of 21-79499-2A **Lab ID:** 21-79499-4

**Sample Description:** OHA_ADJ_GWKAO_1_160321 Duplicate

**Sample Condition**: Acceptable **Sampled Date**: 16-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 102 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 123 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 127 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 108 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 122 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 137 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 117 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 128 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| MPFDoDA | 180 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 218 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 155 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 137 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 119 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 186 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 165 (R) | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 130 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 136 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 103 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-79499-1, 21-79499-2, 21-79499-4

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 105 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 125 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 120 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 126 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 168 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 159 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 119 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 115 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| DNEtFOSE | 158 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 125 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 125 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 106 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## Blank

Relates to sample(s) 21-79499-3

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 100 | % | AsureQuality Method (LC-MS/MS) |

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | 0.0010 µg/L |
| NMeFOSA-M | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.0010 µg/L |
| NMeFOSE-M | 0.0010 µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744117**
**Amended Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 27-May-2021 **AsureQuality Reference: 21-80743** **Sample(s) Received:** 18-Mar-2021 08:35

**Testing Period:** 18-Mar-2021 to 26-May-2021
Date of analysis is available on request.

## Comments

Amended Report: Samples 21-80743-1 and 21-80743-4 have been retested as per customer's request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_BAI_GW111.1_1_170321 **Lab ID:** 21-80743-1

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.083 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.083 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.035 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.085 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.11 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.39 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.28 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.15 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.073 | µg/L | AsureQuality Method (LC-MS/MS) |



  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 114 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 103 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 109 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 117 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 106 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 103 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 105 | % | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| DNMeFOSAA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 104 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 97 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 95 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 96 | % | AsureQuality Method (LC-MS/MS) |

**Customer Sample Name:** OHA_BAI_GW111.2_2_170321 **Lab ID:** 21-80743-2

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 120 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 153 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 141 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 89 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 115 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 126 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 145 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 121 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 127 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 149 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 232 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 731 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 144 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 232 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 170 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 127 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 182 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 175 (R) | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 140 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 151 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 148 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 104 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_BAI_GW111.3_1_170321 **Lab ID:** 21-80743-3

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 63 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 118 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 117 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 117 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 83 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 68 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 61 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 90 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 771 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 83 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 130 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 75 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 50 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 57 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 121 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 130 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 119 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 77 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 100 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_BAI_GWKAT_1_170321 **Lab ID:** 21-80743-4

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.086 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.086 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.035 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.053 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.088 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.39 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.25 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.15 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.072 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 106 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 99 | % | AsureQuality Method (LC-MS/MS) |



**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M7PFUnDA | 121 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 106 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 115 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 107 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 107 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 108 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 103 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 101 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 99 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 118 | % | AsureQuality Method (LC-MS/MS) |

**Customer Sample Name:** OHA_BAI_GW111.1_1_170321 (RETENTION PORTION) **Lab ID:** 21-80743-5

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.082 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.082 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.038 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.054 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.092 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.11 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.41 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.26 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.076 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 108 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 108 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 104 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 106 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 108 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 102 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 108 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 112 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 106 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 110 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 98 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 102 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 97 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 108 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 119 | % | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

**Customer Sample Name:** OHA_BAI_GWKAT_1_170321 (RETENTION PORTION) **Lab ID:** 21-80743-6

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.086 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.086 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.033 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.052 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.085 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.11 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.37 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.25 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.13 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.069 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 118 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 107 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 108 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 109 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 108 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 102 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 108 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 102 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 98 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 98 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 115 | % | AsureQuality Method (LC-MS/MS) |

**Customer Sample Name:** Duplicate of 21-80743-6A **Lab ID:** 21-80743-7

**Sample Description:** OHA_BAI_GWKAT_1_170321 (RETENTION PORTION) Duplicate

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.078 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.078 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.035 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| L-PFOS (5) | 0.053 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.088 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.11 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.37 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.26 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.14 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.063 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 113 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 107 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 113 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 109 | % | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M5PFHxA | 110 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 108 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 108 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 102 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 110 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 106 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 106 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 112 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 98 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 99 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 119 | % | AsureQuality Method (LC-MS/MS) |

## QC Results

### Blank

Relates to sample(s) 21-80743-1, 21-80743-4

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.20 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFOA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 97 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 117 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 113 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 106 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 102 | % | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| MPFOSA | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 117 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 114 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 101 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 96 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 115 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 90 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 97 | % | AsureQuality Method (LC-MS/MS) |

## Blank

Relates to sample(s) 21-80743-1, 21-80743-4, 21-80743-5, 21-80743-6, 21-80743-7

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 114 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 101 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 108 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 117 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 115 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 108 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 115 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 99 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 107 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 106 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 104 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 97 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 110 | % | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M3HFPO-DA | 115 | % | AsureQuality Method (LC-MS/MS) |

## Blank

Relates to sample(s) 21-80743-2, 21-80743-3

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 100 | % | AsureQuality Method (LC-MS/MS) |

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

  

**Report Number 2390370 cancels Report Number 2313644.**

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level**

| | | | |
|---|---|---|---|
| DX-PFCS01, 05-HIGHLEVEL | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Listing applies to samples: 21-80743-2, 21-80743-3** | |
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | NR µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | NR µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS | NR µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA) | 0.0010 µg/L |

  

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| | |
|---|---|
| FPePA (5:3FTA) | 0.0010 µg/L |
| FHpPA (7:3FTA) | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major) | 0.0010 µg/L |
| F-53B (minor) | 0.0010 µg/L |
| Sum F-53B | 0.0010 µg/L |
| ADONA | 0.0010 µg/L |
| HFPO-DA (GenX) | 0.0010 µg/L |

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Listing applies to samples: 21-80743-1, 21-80743-4, 21-80743-5, 21-80743-6, 21-80743-7** | |
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.025 µg/L |
| PFBS | 0.025 µg/L |
| PFPeS | 0.025 µg/L |
| di-PFHxS (1) | 0.025 µg/L |
| mono-PFHxS (1) | 0.025 µg/L |
| L-PFHxS (1) | 0.025 µg/L |
| Total PFHxS (3) | 0.025 µg/L |
| PFHpS | 0.025 µg/L |
| di-PFOS (5) | 0.025 µg/L |
| mono-PFOS (5) | 0.025 µg/L |
| L-PFOS (5) | 0.025 µg/L |
| Total PFOS (7) | 0.025 µg/L |
| Sum PFHxS+PFOS (1) | 0.025 µg/L |
| PFNS | 0.050 µg/L |
| PFDS | 0.10 µg/L |
| PFECHS | 0.025 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.10 µg/L |
| PFPeA | 0.10 µg/L |
| PFHxA | 0.025 µg/L |
| PFHpA | 0.025 µg/L |
| PFOA | 0.025 µg/L |
| PFNA | 0.025 µg/L |
| PFDA | 0.025 µg/L |
| PFUnDA | 0.025 µg/L |
| PFDoDA | 0.10 µg/L |
| PFTrDA | 0.10 µg/L |
| PFTeDA | 0.10 µg/L |
| P37DMOA | 0.050 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.025 µg/L |
| NEtFOSA-M | 0.10 µg/L |
| NMeFOSA-M | 0.10 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.025 µg/L |
| NMeFOSAA | 0.025 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.10 µg/L |
| NMeFOSE-M | 0.10 µg/L |
| **Telomere Sulfonic acids** | |

| | |
|---|---|
| 4:2 FTS | 0.025 µg/L |
| 6:2 FTS | 0.050 µg/L |
| 8:2 FTS | 0.10 µg/L |
| 10:2 FTS | 0.025 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA) | 0.10 µg/L |
| FPePA (5:3FTA) | 0.025 µg/L |
| FHpPA (7:3FTA) | 0.025 µg/L |
| **Miscellaneous** | |
| F-53B (major) | 0.10 µg/L |
| F-53B (minor) | 0.050 µg/L |
| Sum F-53B | 0.1 µg/L |
| ADONA | 0.025 µg/L |
| HFPO-DA (GenX) | 0.050 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Listing applies to samples: 21-80743-2, 21-80743-3** | |
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Analyte | Full Name |
|---|---|
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA) | 3-Perfluoropropyl propanoic acid |
| FPePA (5:3FTA) | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA) | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major) | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor) | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B | Sum of F-53B components (major + minor) |
| ADONA | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX) | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Listing applies to samples: 21-80743-1, 21-80743-4, 21-80743-5, 21-80743-6, 21-80743-7** | |
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |

| Analyte | Full Name |
|---|---|
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA) | 3-Perfluoropropyl propanoic acid |
| FPePA (5:3FTA) | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA) | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major) | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor) | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B | Sum of F-53B components (major + minor) |
| ADONA | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX) | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |

  

**Report Number 2390370 cancels Report Number 2313644.**

| Analyte | Full Name |
|---|---|
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

**Report Number 2390370 cancels Report Number 2313644.**

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# Certificate of Analysis

**Submission Reference: A02744117**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 01-Apr-2021 **AsureQuality Reference: 21-80812** **Sample(s) Received:** 18-Mar-2021 08:35

**Testing Period:** 18-Mar-2021 to 01-Apr-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_FTA_WS1_5_170321 **Lab ID:** 21-80812-1

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | 0.013 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.026 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.024 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.033 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.13 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.16 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | 0.0018 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | 0.0029 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.019 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.011 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.033 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.19 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.018 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.089 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.082 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.030 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.024 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.0065 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | 0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 102 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 108 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 113 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 87 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 95 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 94 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 92 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 114 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 215 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 0 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 149 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 220 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 237 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 121 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 459 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 242 (R) | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 79 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_FTA_GWKAR_1_170321 **Lab ID:** 21-80812-2

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 96 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 87 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 81 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 95 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 88 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 91 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 85 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 89 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 79 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 64 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 89 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 0 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 165 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 417 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 385 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 89 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 81 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 494 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 277 (R) | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 87 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 95 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 77 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 78 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_FTA_GWKAS_1_170321 **Lab ID:** 21-80812-3

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 86 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 73 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 72 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 91 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 89 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 88 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 84 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 75 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 76 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 72 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 61 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 89 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 0 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 137 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 539 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 545 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 79 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 75 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 421 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 229 (R) | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 88 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 80 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 68 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 76 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_ADJ_GWAKAQ_1_170321 **Lab ID:** 21-80812-4

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | 0.013 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.027 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.024 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.032 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.13 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.16 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | 0.0020 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | 0.0028 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.022 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.0088 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.034 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.19 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.019 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.087 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.030 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.0071 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | 0.11 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 114 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 113 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 121 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 108 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 121 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 93 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 123 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 93 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| MPFDoDA | 104 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 82 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 95 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 30 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 42 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 106 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 107 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 45 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 76 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 140 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 117 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 113 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 95 | % | AsureQuality Method (LC-MS/MS) |

## QC Results

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Relates to sample(s) 21-80812-1, 21-80812-2, 21-80812-3

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 81 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 62 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 56 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 92 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 80 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 71 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 60 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 59 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 57 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 42 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 54 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 0 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 99 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 90 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 183 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 74 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 65 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 140 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| DNMeFOSE | 130 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 88 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 1 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 63 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 86 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

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Relates to sample(s) 21-80812-4

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| | | | |
|---|---|---|---|
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 111 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 107 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 104 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 118 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 104 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 79 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 58 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 86 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 34 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 48 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 34 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 53 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 115 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 107 | % | AsureQuality Method (LC-MS/MS) |

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier, Lisa Graham |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

**Lisa Graham**
**Scientist / Team Leader**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | NR µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Nerena Rhodes**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 01-Apr-2021 **AsureQuality Reference: 21-80845** **Sample(s) Received:** 18-Mar-2021 08:35

**Testing Period:** 18-Mar-2021 to 01-Apr-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW67_5_170321 **Lab ID:** 21-80845-1

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | 0.0013 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.0072 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 77 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 102 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 27 (R) | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 44 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 54 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 66 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 89 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 85 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 89 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 88 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 171 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 0 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 95 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 110 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 125 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 107 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 91 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 132 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 118 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 279 (R) | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 201 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 46 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-80845-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 81 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 62 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 56 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 92 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 80 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 71 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 60 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 59 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 57 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 42 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 54 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 0 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 99 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 90 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 183 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 74 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 65 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 140 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 130 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 88 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 1 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 63 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 86 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | NR µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | NR µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744117**
**Final Report**

**Kate Walker**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 09-Apr-2021 **AsureQuality Reference: 21-82032** **Sample(s) Received:** 19-Mar-2021 08:25

**Testing Period:** 19-Mar-2021 to 09-Apr-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_SHW_SW4_3_180321 **Lab ID:** 21-82032-1

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.0012 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.0029 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.0036 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.0065 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.012 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.037 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.096 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.079 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.048 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.013 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.0039 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | 0.0096 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 124 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 123 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 122 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 76 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 107 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 112 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 84 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 207 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 76 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 100 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 98 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 48 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 46 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 382 (R) | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 180 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 97 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 86 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_SHW_SWKAU_1_180321 **Lab ID:** 21-82032-2

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 92 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 91 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 97 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 93 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 91 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 83 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 80 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 82 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 81 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 117 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 167 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 96 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 107 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | NR | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | NR | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 91 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 86 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 85 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 94 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** Duplicate of 21-82032-1A **Lab ID:** 21-82032-3

**Sample Description:** OHA_SHW_SW4_3_180321 Duplicate

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.0012 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.0052 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.0052 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.0030 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.0033 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.0063 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.012 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.038 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.098 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.084 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.048 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.011 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.0043 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | 0.0089 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 118 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 120 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 78 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 89 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 92 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 121 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 112 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 201 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 85 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 85 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 124 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 119 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 51 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 64 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 346 (R) | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 185 (R) | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 123 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 73 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

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Relates to sample(s) 21-82032-1, 21-82032-3

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 111 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 107 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 106 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M5PFHxA | 104 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 118 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 104 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 79 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 58 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 86 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 34 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 48 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 101 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 34 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 53 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 112 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 115 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 107 | % | AsureQuality Method (LC-MS/MS) |

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Relates to sample(s) 21-82032-2

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 112 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 102 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 87 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 76 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 63 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 60 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | NR | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| DNMeFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 70 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 87 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 94 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 46 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 114 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 93 | % | AsureQuality Method (LC-MS/MS) |

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Lisa Graham |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

NR = Not Reportable

**Lisa Graham**

**Scientist / Team Leader**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | 0.0010 µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | 0.0010 µg/L |
| PFTrDA | 0.0010 µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | 0.0010 µg/L |
| NMeFOSA-M | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.0010 µg/L |
| NMeFOSE-M | 0.0010 µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744115**
**Final Report**

**Kate Walker**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 15-Apr-2021 **AsureQuality Reference: 21-82043** **Sample(s) Received:** 19-Mar-2021 08:25

**Testing Period:** 19-Mar-2021 to 15-Apr-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_ADJ_GW112.1_1_180321 **Lab ID:** 21-82043-1

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 110 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 124 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 151 (R) | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 95 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 112 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 114 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 113 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 121 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 139 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 158 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 163 (R) | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 126 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 84 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 114 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 109 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 66 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 79 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 117 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 134 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 130 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 112 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** OHA_ADJ_GW112.2_1_180321 **Lab ID:** 21-82043-2

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | 0.012 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.030 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.035 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.056 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.29 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.35 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | 0.0075 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | 0.012 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.16 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.21 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 0.38 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.73 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.11 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.40 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.34 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.092 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.041 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | 0.066 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 99 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 123 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 89 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 90 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 68 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 53 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 98 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 155 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 29 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 45 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 78 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 67 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 123 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 79 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

**Customer Sample Name:** Duplicate of 21-82043-1A **Lab ID:** 21-82043-3

**Sample Description:** OHA_ADJ_GW112.1-1_180321 Duplicate

**Sample Condition**: Acceptable

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.20 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| ADONA * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 102 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 98 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 109 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 97 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 116 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 122 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 116 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 120 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 115 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 132 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 116 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 106 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 98 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 115 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 104 | % | AsureQuality Method (LC-MS/MS) |

**Customer Sample Name:** Duplicate of 21-82043-1A **Lab ID:** 21-82043-4

**Sample Description:** OHA_ADJ_GW112.1_1_180321 Duplicate

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 111 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 118 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 130 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 115 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 125 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 168 (R) | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| MPFDoDA | 98 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 90 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 51 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 34 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 49 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 64 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 39 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 52 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 132 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 127 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 139 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 123 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

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Relates to sample(s) 21-82043-1, 21-82043-3

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.20 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 97 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 117 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 113 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 106 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 102 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 104 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 117 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 113 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 101 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| DNEtFOSE | 114 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 101 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 96 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 115 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 90 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 97 | % | AsureQuality Method (LC-MS/MS) |

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Relates to sample(s) 21-82043-1, 21-82043-4

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| | | | |
|---|---|---|---|
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 98 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 107 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 101 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 105 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 107 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 122 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 105 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 97 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 88 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 98 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 107 | % | AsureQuality Method (LC-MS/MS) |

  

## Blank

Relates to sample(s) 21-82043-2

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 112 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 102 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 87 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 76 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 63 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 60 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 70 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 87 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 94 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 46 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 114 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 93 | % | AsureQuality Method (LC-MS/MS) |

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Lisa Graham |

  

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level**

| | | | |
|---|---|---|---|
| DX-PFCS01, 05-HIGHLEVEL | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Amelie Sellier**
**Scientist**

**Lisa Graham**
**Scientist / Team Leader**

## Accreditation

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Listing applies to samples: 21-82043-1, 21-82043-2, 21-82043-4** | |
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | 0.0010 µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | NR µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | NR µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | 0.0010 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FPePA (5:3FTA)* | 0.0010 µg/L |
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Listing applies to samples: 21-82043-3** | |
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.025 µg/L |
| PFBS | 0.025 µg/L |
| PFPeS | 0.025 µg/L |
| di-PFHxS (1) | 0.025 µg/L |
| mono-PFHxS (1) | 0.025 µg/L |
| L-PFHxS (1) | 0.025 µg/L |
| Total PFHxS (3) | 0.025 µg/L |
| PFHpS | 0.025 µg/L |
| di-PFOS (5) | 0.025 µg/L |
| mono-PFOS (5) | 0.025 µg/L |
| L-PFOS (5) | 0.025 µg/L |
| Total PFOS (7) | 0.025 µg/L |
| Sum PFHxS+PFOS (1) | 0.025 µg/L |
| PFNS | 0.050 µg/L |
| PFDS | 0.10 µg/L |
| PFECHS* | 0.025 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.10 µg/L |
| PFPeA | 0.10 µg/L |
| PFHxA | 0.025 µg/L |
| PFHpA | 0.025 µg/L |
| PFOA | 0.025 µg/L |
| PFNA | 0.025 µg/L |
| PFDA | 0.025 µg/L |
| PFUnDA | 0.025 µg/L |
| PFDoDA | 0.10 µg/L |
| PFTrDA | 0.10 µg/L |
| PFTeDA | 0.10 µg/L |
| P37DMOA* | 0.050 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.025 µg/L |
| NEtFOSA-M | 0.10 µg/L |
| NMeFOSA-M | 0.10 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.025 µg/L |
| NMeFOSAA | 0.025 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.10 µg/L |
| NMeFOSE-M | 0.10 µg/L |
| **Telomere Sulfonic acids** | |

  

| | |
|---|---|
| 4:2 FTS | 0.025 µg/L |
| 6:2 FTS | 0.050 µg/L |
| 8:2 FTS | 0.10 µg/L |
| 10:2 FTS* | 0.025 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.10 µg/L |
| FPePA (5:3FTA)* | 0.025 µg/L |
| FHpPA (7:3FTA)* | 0.025 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.10 µg/L |
| F-53B (minor)* | 0.050 µg/L |
| Sum F-53B* | 0.1 µg/L |
| ADONA* | 0.025 µg/L |
| HFPO-DA (GenX)* | 0.050 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Listing applies to samples: 21-82043-1, 21-82043-2, 21-82043-4** | |
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |

  

| Analyte | Full Name |
|---|---|
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Listing applies to samples: 21-82043-3** | |
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |

  

| Analyte | Full Name |
|---|---|
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |

  

| Analyte | Full Name |
|---|---|
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744117**
**Final Report**

**Kate Walker**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 09-Apr-2021 **AsureQuality Reference: 21-82072** **Sample(s) Received:** 19-Mar-2021 08:25

**Testing Period:** 19-Mar-2021 to 09-Apr-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_QRY_WS2_8_180321 **Lab ID:** 21-82072-1

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.0029 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.0029 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 0.0029 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.0034 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.0040 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.0026 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.0015 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.0012 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 95 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 99 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 95 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 91 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 91 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 85 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 84 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 45 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 34 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 142 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 28 (R) | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 51 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 45 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 37 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 129 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 91 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 85 | % | AsureQuality Method (LC-MS/MS) |

R = Recovery outside method limits

## QC Results

### Blank

Relates to sample(s) 21-82072-1

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.0050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| NMeFOSAA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | NR | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.0010 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 111 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 112 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 102 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 96 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 87 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 76 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 63 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | NR | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 60 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | NR | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 70 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 87 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 94 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 46 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 114 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 93 | % | AsureQuality Method (LC-MS/MS) |

  

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water** | | | |
| DX-PFCS01, 03-SUITE_B | AsureQuality Method (LC-MS/MS) | IANZ | Lisa Graham |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)
mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)
L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)
Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)
di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)
mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)
L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)
Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)
Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)
Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)
For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.
Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.
Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.
NR = Not Reportable

**Lisa Graham**
**Scientist / Team Leader**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.0010 µg/L |
| PFBS | 0.0010 µg/L |
| PFPeS | 0.0010 µg/L |
| di-PFHxS (1) | 0.0010 µg/L |
| mono-PFHxS (1) | 0.0010 µg/L |
| L-PFHxS (1) | 0.0010 µg/L |
| Total PFHxS (3) | 0.0010 µg/L |
| PFHpS | 0.0010 µg/L |
| di-PFOS (5) | 0.0010 µg/L |
| mono-PFOS (5) | 0.0010 µg/L |
| L-PFOS (5) | 0.0010 µg/L |
| Total PFOS (7) | 0.0010 µg/L |
| Sum PFHxS+PFOS (1) | 0.0010 µg/L |
| PFNS | 0.0010 µg/L |
| PFDS | 0.0010 µg/L |
| PFECHS* | 0.0010 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.0010 µg/L |
| PFPeA | 0.0010 µg/L |
| PFHxA | 0.0010 µg/L |
| PFHpA | 0.0010 µg/L |
| PFOA | 0.0010 µg/L |
| PFNA | 0.0010 µg/L |
| PFDA | 0.0010 µg/L |
| PFUnDA | 0.0010 µg/L |
| PFDoDA | NR µg/L |
| PFTrDA | NR µg/L |
| PFTeDA | NR µg/L |
| P37DMOA* | 0.0010 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.0010 µg/L |
| NEtFOSA-M | NR µg/L |
| NMeFOSA-M | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.0010 µg/L |
| NMeFOSAA | 0.0010 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | NR µg/L |
| NMeFOSE-M | NR µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.0010 µg/L |
| 6:2 FTS | 0.0010 µg/L |
| 8:2 FTS | 0.0010 µg/L |
| 10:2 FTS* | NR µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.0010 µg/L |
| FPePA (5:3FTA)* | 0.0010 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.0010 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.0010 µg/L |
| F-53B (minor)* | 0.0010 µg/L |
| Sum F-53B* | 0.0010 µg/L |
| ADONA* | 0.0010 µg/L |
| HFPO-DA (GenX)* | 0.0010 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

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# Certificate of Analysis

**Submission Reference: A02744117**
**Final Report**

**Kate Walker**
**Pattle Delamore Partners Limited**
**P O Box 9528**
**Auckland 1149**
**New Zealand**

PO Number: OHA_PFAS

**Report Issued:** 30-Mar-2021 **AsureQuality Reference: 21-83796** **Sample(s) Received:** 22-Mar-2021 09:50

**Testing Period:** 22-Mar-2021 to 30-Mar-2021
Date of analysis is available on request.

## Results

The tests were performed on the samples as received.

**Customer Sample Name:** OHA_FTA_MW4_6_190321 **Lab ID:** 21-83796-1

**Sample Condition**: Acceptable **Sampled Date**: 19-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.034 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.046 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.083 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.46 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 0.54 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | 0.029 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.46 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.91 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 1.4 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 1.9 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.17 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 0.79 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.51 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.26 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.25 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.13 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |



  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | 0.45 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 103 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 102 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 104 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 100 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 84 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 65 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 70 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 98 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 88 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 59 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 65 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 70 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 68 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 67 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M4:2FTS | 111 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 116 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 83 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 110 | % | AsureQuality Method (LC-MS/MS) |

**Customer Sample Name:** OHA_RUP_MW6_7_170321 **Lab ID:** 21-83796-2

**Sample Condition**: Acceptable **Sampled Date**: 17-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | 0.028 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.11 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.12 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | 0.25 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 1.6 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 1.8 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | 0.060 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | 0.075 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 1.1 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 1.7 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 2.9 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 4.7 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.35 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 1.1 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 0.78 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.37 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.35 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.28 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | 0.84 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 115 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 100 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 117 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 110 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 72 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 79 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 103 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 94 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 72 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 75 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 87 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 76 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 120 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 126 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 99 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 106 | % | AsureQuality Method (LC-MS/MS) |

**Customer Sample Name:** OHA_DTK_MW9_6_180321 **Lab ID:** 21-83796-3

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | 0.064 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | 0.069 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| mono-PFHxS (1) | 0.14 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | 0.91 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | 1.0 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | 0.034 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | 0.045 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | 0.52 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | 0.46 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | 1.0 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | 2.0 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | 0.51 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | 2.3 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | 1.3 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | 0.56 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | 0.48 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | 0.26 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | 3.2 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Internal Standards** | | | |
| M3PFBS | 106 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 105 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 92 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 110 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 107 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 107 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 99 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 79 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 68 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 63 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 96 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 87 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 57 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 58 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 65 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 77 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 62 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 61 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 117 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 119 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 93 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 107 | % | AsureQuality Method (LC-MS/MS) |

**Customer Sample Name:** OHA_ADJ_GWKAV_1_180321 **Lab ID:** 21-83796-4

**Sample Condition**: Acceptable **Sampled Date**: 18-Mar-2021

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| PFHxA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B * | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA * | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) * | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 99 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 101 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 96 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 109 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 105 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 106 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 103 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 101 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 85 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 65 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 67 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 88 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 90 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| DNEtFOSA | 61 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 66 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 69 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 82 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 65 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 69 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 113 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 118 | % | AsureQuality Method (LC-MS/MS) |
| M8:2FTS | 96 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA * | 88 | % | AsureQuality Method (LC-MS/MS) |

## QC Results

### Blank

Relates to sample(s) 21-83796-1, 21-83796-2, 21-83796-3, 21-83796-4

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| **Perfluoroalkylsulfonic acids** | | | |
| PFPrS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFBS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFHxS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFHxS (3) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| di-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| mono-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| L-PFOS (5) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Total PFOS (7) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum PFHxS+PFOS (1) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFECHS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluoroalkylcarboxylic acids** | | | |
| PFBA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFPeA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHxA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFHpA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFOA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFNA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFUnDA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFDoDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTrDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| PFTeDA | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| P37DMOA | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |

  

| | | | |
|---|---|---|---|
| **Perfluorooctanesulfonamides** | | | |
| PFOSA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NEtFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSA-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoacetic acids** | | | |
| NEtFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSAA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Perfluorooctanesulfonamidoethanols** | | | |
| NEtFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| NMeFOSE-M | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Sulfonic acids** | | | |
| 4:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| 6:2 FTS | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| 8:2 FTS | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| 10:2 FTS | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Telomere Carboxylic acids** | | | |
| FPrPA (3:3FTA) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| FPePA (5:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| FHpPA (7:3FTA) | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Miscellaneous** | | | |
| F-53B (major) | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| F-53B (minor) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| Sum F-53B | <0.10 | µg/L | AsureQuality Method (LC-MS/MS) |
| ADONA | <0.025 | µg/L | AsureQuality Method (LC-MS/MS) |
| HFPO-DA (GenX) | <0.050 | µg/L | AsureQuality Method (LC-MS/MS) |
| **Internal Standards** | | | |
| M3PFBS | 97 | % | AsureQuality Method (LC-MS/MS) |
| M3PFHxS | 96 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOS | 88 | % | AsureQuality Method (LC-MS/MS) |
| M4PFBA | 97 | % | AsureQuality Method (LC-MS/MS) |
| M5PFPeA | 102 | % | AsureQuality Method (LC-MS/MS) |
| M5PFHxA | 100 | % | AsureQuality Method (LC-MS/MS) |
| MPFHpA | 98 | % | AsureQuality Method (LC-MS/MS) |
| M8PFOA | 94 | % | AsureQuality Method (LC-MS/MS) |
| M9PFNA | 90 | % | AsureQuality Method (LC-MS/MS) |
| M6PFDA | 79 | % | AsureQuality Method (LC-MS/MS) |
| M7PFUnDA | 80 | % | AsureQuality Method (LC-MS/MS) |
| MPFDoDA | 81 | % | AsureQuality Method (LC-MS/MS) |
| MPFTeDA | 106 | % | AsureQuality Method (LC-MS/MS) |
| MPFOSA | 89 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSA | 70 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSA | 72 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSAA | 76 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSAA | 84 | % | AsureQuality Method (LC-MS/MS) |
| DNEtFOSE | 74 | % | AsureQuality Method (LC-MS/MS) |
| DNMeFOSE | 73 | % | AsureQuality Method (LC-MS/MS) |
| M4:2FTS | 104 | % | AsureQuality Method (LC-MS/MS) |
| M6:2FTS | 104 | % | AsureQuality Method (LC-MS/MS) |

  

| Test | Result | Unit | Method Reference |
|---|---|---|---|
| M8:2FTS | 85 | % | AsureQuality Method (LC-MS/MS) |
| M3HFPO-DA | 90 | % | AsureQuality Method (LC-MS/MS) |

## Analysis Summary

### Wellington Laboratory

| Analysis | Method | Accreditation | Authorised by |
|---|---|---|---|
| **Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level** | | | |
| DX-PFCS01, 05-HIGHLEVEL | AsureQuality Method (LC-MS/MS) | IANZ | Amelie Sellier |

di-PFHxS (1) = Concentration determined using a branched di-PFHxS isomer standard (399>80 transition)

mono-PFHxS (1) = Concentration determined using a branched mono-PFHxS isomer standard (399>80 transition)

L-PFHxS (1) = Concentration determined using the linear PFHxS isomer standard (399>80 transition)

Total PFHxS (3) = The numerical sum of di-PFHxS (1), mono-PFHxS (1), and L-PFHxS (1)

di-PFOS (5) = Concentration determined using a branched di-PFOS isomer standard (499>80 transition)

mono-PFOS (5) = Concentration determined using a branched mono-PFOS isomer standard (499>80 transition)

L-PFOS (5) = Concentration determined using the linear PFOS isomer standard (499>230 transition)

Total PFOS (7) = The numerical sum of di-PFOS (5), mono-PFOS (5), and L-PFOS (5)

Sum PFHxS+PFOS (1) = The numerical sum of Total PFHxS (3) and Total PFOS (7)

Sum F-53B = The numerical sum of 9Cl-PF3ONS (F-53B major) and 11Cl-PF3OUdS (F-53B minor)

For all Totals, where a component is detected below the LOR, the value of zero is used in the calculation of the sum. The result represents the lower-bound concentration present in the sample.

Reported results are corrected for internal standard recovery

Any tests marked with * are not accredited for specific matrices or analytes.

Results that are prefixed with '<' indicate the lowest level at which the analyte can be reported, and that in this case the analyte was not observed above this limit.

**Amelie Sellier**

**Scientist**

## Accreditation

  

# Appendix

## Analyte LOR Summary

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)**

| Analyte | LOR |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | 0.025 µg/L |
| PFBS | 0.025 µg/L |
| PFPeS | 0.025 µg/L |
| di-PFHxS (1) | 0.025 µg/L |
| mono-PFHxS (1) | 0.025 µg/L |
| L-PFHxS (1) | 0.025 µg/L |
| Total PFHxS (3) | 0.025 µg/L |
| PFHpS | 0.025 µg/L |
| di-PFOS (5) | 0.025 µg/L |
| mono-PFOS (5) | 0.025 µg/L |
| L-PFOS (5) | 0.025 µg/L |
| Total PFOS (7) | 0.025 µg/L |
| Sum PFHxS+PFOS (1) | 0.025 µg/L |
| PFNS | 0.050 µg/L |
| PFDS | 0.10 µg/L |
| PFECHS* | 0.025 µg/L |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | 0.10 µg/L |
| PFPeA | 0.10 µg/L |
| PFHxA | 0.025 µg/L |
| PFHpA | 0.025 µg/L |
| PFOA | 0.025 µg/L |
| PFNA | 0.025 µg/L |
| PFDA | 0.025 µg/L |
| PFUnDA | 0.025 µg/L |
| PFDoDA | 0.10 µg/L |
| PFTrDA | 0.10 µg/L |
| PFTeDA | 0.10 µg/L |
| P37DMOA* | 0.050 µg/L |
| **Perfluorooctanesulfonamides** | |
| PFOSA | 0.025 µg/L |
| NEtFOSA-M | 0.10 µg/L |
| NMeFOSA-M | 0.10 µg/L |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | 0.025 µg/L |
| NMeFOSAA | 0.025 µg/L |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 0.10 µg/L |
| NMeFOSE-M | 0.10 µg/L |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 0.025 µg/L |
| 6:2 FTS | 0.050 µg/L |
| 8:2 FTS | 0.10 µg/L |
| 10:2 FTS* | 0.025 µg/L |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 0.10 µg/L |
| FPePA (5:3FTA)* | 0.025 µg/L |

  

| | |
|---|---|
| FHpPA (7:3FTA)* | 0.025 µg/L |
| **Miscellaneous** | |
| F-53B (major)* | 0.10 µg/L |
| F-53B (minor)* | 0.050 µg/L |
| Sum F-53B* | 0.1 µg/L |
| ADONA* | 0.025 µg/L |
| HFPO-DA (GenX)* | 0.050 µg/L |

## Analyte Definitions

**Poly- and Perfluorinated Alkyl Substances (PFAS) in Water - High Level - AsureQuality Method (LC-MS/MS)**

| Analyte | Full Name |
|---|---|
| **Perfluoroalkylsulfonic acids** | |
| PFPrS | Perfluoro-1-propanesulfonic acid |
| PFBS | Perfluoro-1-butanesulfonic acid |
| PFPeS | Perfluoro-1-pentanesulfonic acid |
| di-PFHxS (1) | Total Perfluorodimethylbutane sulfonic acids |
| mono-PFHxS (1) | Total Perfluoromethylpentane sulfonic acids |
| L-PFHxS (1) | Linear Perfluorohexanesulfonic acid |
| PFHpS | Perfluoro-1-heptanesulfonic acid |
| di-PFOS (5) | Total Perfluorodimethylhexane sulfonic acids |
| mono-PFOS (5) | Total Perfluoromethylheptane sulfonic acids |
| L-PFOS (5) | Linear Perfluorooctanesulfonic acid |
| PFNS | Perfluoro-1-nonanesulfonic acid |
| PFDS | Perfluoro-1-decanesulfonic acid |
| PFECHS* | Perfluoro-4-ethylcyclohexanesulfonic acid |
| **Perfluoroalkylcarboxylic acids** | |
| PFBA | Perfluoro-n-butanoic acid |
| PFPeA | Perfluoro-n-pentanoic acid |
| PFHxA | Perfluoro-n-hexanoic acid |
| PFHpA | Perfluoro-n-heptanoic acid |
| PFOA | Perfluoro-n-octanoic acid |
| PFNA | Perfluoro-n-nonanoic acid |
| PFDA | Perfluoro-n-decanoic acid |
| PFUnDA | Perfluoro-n-undecanoic acid |
| PFDoDA | Perfluoro-n-dodecanoic acid |
| PFTrDA | Perfluoro-n-tridecanoic acid |
| PFTeDA | Perfluoro-n-tetradecanoic acid |
| P37DMOA* | Perfluoro-3,7-dimethyloctanoic acid |
| **Perfluorooctanesulfonamides** | |
| PFOSA | Perfluoro-1-octanesulfonamide |
| NEtFOSA-M | N-ethylperfluoro-1-octanesulfonamide |
| NMeFOSA-M | N-methylperfluoro-1-octanesulfonamide |
| **Perfluorooctanesulfonamidoacetic acids** | |
| NEtFOSAA | N-ethylperfluoro-1-octanesulfonamidoacetic acid |
| NMeFOSAA | N-methylperfluoro-1-octanesulfonamidoacetic acid |
| **Perfluorooctanesulfonamidoethanols** | |
| NEtFOSE-M | 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol |
| NMeFOSE-M | 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol |
| **Telomere Sulfonic acids** | |
| 4:2 FTS | 1H,1H,2H,2H-perfluoro-1-hexanesulfonic acid |
| 6:2 FTS | 1H,1H,2H,2H-perfluoro-1-octanesulfonic acid |
| 8:2 FTS | 1H,1H,2H,2H-perfluoro-1-decanesulfonic acid |
| 10:2 FTS* | 1H,1H,2H,2H-perfluorododecanesulfonic acid |
| **Telomere Carboxylic acids** | |
| FPrPA (3:3FTA)* | 3-Perfluoropropyl propanoic acid |

  

| Analyte | Full Name |
|---|---|
| FPePA (5:3FTA)* | 3-Perfluoropentyl propanoic acid |
| FHpPA (7:3FTA)* | 3-Perfluoroheptyl propanoic acid |
| **Miscellaneous** | |
| F-53B (major)* | 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid |
| F-53B (minor)* | 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid |
| Sum F-53B* | Sum of F-53B components (major + minor) |
| ADONA* | Dodecafluoro-3H-4,8-dioxanonanoic acid |
| HFPO-DA (GenX)* | Tetrafluoro-2-(heptafluoropropoxy)propanoic acid |
| **Internal Standards** | |
| M3PFBS | Perfluoro-1-[2,3,4-13C3]butanesulfonic acid |
| M3PFHxS | Perfluoro-1-[1,2,3-13C3]hexanesulfonic acid |
| M8PFOS | Perfluoro-1-[13C8]octanesulfonic acid |
| M4PFBA | Perfluoro-n-[1,2,3,4-13C4]butanoic acid |
| M5PFPeA | Perfluoro-n-[1,2,3,4,5-13C5]pentanoic acid |
| M5PFHxA | Perfluoro-n-[1,2,3,4,6-13C5]hexanoic acid |
| MPFHpA | Perfluoro-n-[-1,2,3,4-13C4]heptanoic acid |
| M8PFOA | Perfluoro-n-[13C8]octanoic acid |
| M9PFNA | Perfluoro-n-[13C9]nonanoic acid |
| M6PFDA | Perfluoro-n-[1,2,3,4,5,6-13C6]decanoic acid |
| M7PFUnDA | Perfluoro-n-[1,2,3,4,5,6,7-13C7]undecanoic acid |
| MPFDoDA | Perfluoro-n-[1,2-13C2]dodecanoic acid |
| MPFTeDA | Perfluoro-n-[1,2-13C2]tetradecanoic acid |
| MPFOSA | Perfluoro-1-[13C8]octanesulfonamide |
| DNEtFOSA | N-ethyl-D5-perfluoro-1-octanesulfonamide |
| DNMeFOSA | N-methyl-D3-perfluoro-1-octanesulfonamide |
| DNEtFOSAA | N-ethyl-D5-perfluoro-1-octanesulfonamidoacetic acid |
| DNMeFOSAA | N-methyl-D3-perfluoro-1-octanesulfonamidoacetic acid |
| DNEtFOSE | 2-(N-ethyl-D5-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| DNMeFOSE | 2-(N-methyl-D3-perfluoro-1-octanesulfonamido)ethan-D4-ol |
| M4:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-hexane sulfonic acid |
| M6:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-octane sulfonic acid |
| M8:2FTS | 1H,1H,2H,2H-perfluoro-1-[1,2-13C2]-decane sulfonic acid |
| M3HFPO-DA* | Tetrafluoro-2-(heptafluoropropoxy)-13C3-propanoic acid |

Any tests marked with * are not accredited for specific matrices or analytes.

LOR = Limit of Reporting LOD = Limit of Detection NR = Not Reportable

  

# Food and Environmental Submission Form/Chain of Custody

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Company Name:* PDP

Contact Person:* Tom Harvey

Email:* tom.harvey@pdp.co.nz

Contact Phone No.:* 0223144248

Address:

235 Broadway, Newmarket, Auckland,10

Submission Ref.: A02744117

Purchase Order No.: OHA_PFAS

Contract/Quote No.:

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Date/Time Dispatched:

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☐ Return sample(s) after analysis *(Courier fees apply)*

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AQ to composite samples? ☐ Yes

Are samples hazardous to health?* ☐ Yes ■ No

Water samples submitted?* ■ Potable ■ Non-Potable

*AQ Project Reference*
*(AQ Use Only)*


**AsureQuality Limited**
Wellington Laboratory
1C Quadrant Drive, Waiwhetu
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**Tel:** +64 4 570 8359
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| OHA_DTK_MW9_6_ 0321 | Non Potable | | /03/2021 | PFAS Suite (High level) | |
| OHA_FTA_WS1_5_ 0321 | Non Potable | | /03/2021 | PFAS Suite (High level) | |
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Received By (Name):*
Signed By:*

*Receipt Details*
*(AQ Use Only)*

# Appendix C: Groundwater Level Measurements

**Appendix C: March 2021 Well Details and Water Level**

| Monitoring Well Ref | GW106 | GW107[1] | GW108 | GW109 | GW6 | MW4 | MW6 | MW9 |
|---|---|---|---|---|---|---|---|---|
| Total Depth of Well (m below TOC [2]) | 6.96 | 10.7 | 3.88 | 7.8 | 6.9 | 9.9 | 4.5 | 4.5 |
| Diameter (mm) | 50 | 50 | 50 | 50 | 1070 | 50 | 40 | 40 |
| TOC (m bgl) | 0.05 | 0.08 | 0.04 | 0.04 | 0.67 m agl [3] | 0.00 | 0.09 | 0.06 |
| **Date** | **16/03/2021** | **Not Sampled** | **15/03/2021** | | **16/03/2021** | **19/03/2021** | **17/03/2021** | **18/03/2021** |
| Depth to Water (m below ground level) | 2.45 | NA | 1.74 | 4.69 | 5.10 | 7.11 | 3.60 | 2.24 |
| Water depth (m below TOC) | 2.40 | NA | 1.70 | 4.65 | 5.77 | 7.11 | 3.51 | 2.18 |

| Monitoring Well Ref | GW111.1 | GW111.2 | GW111.3 | GW112.1 | GW112.2 |
|---|---|---|---|---|---|
| Total Depth of Well (m below TOC [2]) | 11.24 | 40.5 | 84.5 | 10.4 | 55.4 |
| Diameter (mm) | 50 | 50 | 50 | 50 | 50 |
| TOC (m bgl) | 0.48 m agl [3] | 0.49 m agl [3] | 0.50 m agl [3] | 0.55 m agl [3] | 1.08 m agl [3] |
| **Date** | **17/03/2021** | | | **18/03/2021** | |
| Depth to Water (m below ground level) | 7.18 | 8.71 | 6.28 | 1.55 | 0.88 |
| Water depth (m below TOC) | 7.66 | 9.20 | 6.78 | 2.10 | 1.96 |

Notes:
1. GW107 not sampled due to traffic management concerns
2. TOC = top of casing.
3. agl = above ground level.

# Appendix D: Field Sheets

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Speedy Road

Weather:

Sample point: tap / well / surface water

Description of sample point: Pipe feeding tank

Distance of sample point from bore: (m)

Sampling equipment: –

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A02744117

Sample Code (Name): CW31

Date and time: 15/08/21

Coordinates (NZTM): E

N

Sampled By: DH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☑ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | – | 11.32 | – | 17.4 | 6.94 | 485.1 | -88.8 | 5.55 | – | 9.72 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**
Water sample internal ø = 6mm ≈ 30mL per meter

Comments: Sample bore pump has changed. Now bore feeds tank directly. Sampled from bore intake at top of tank.

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | |
|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☑ No | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: SH1

Weather: Fine Rain

Sample point: tap / well / surface water

Description of sample point: Artesian Well

Distance of sample point from bore: (m)

Sampling equipment: –

QA/QA Sample Codes: –

Duplicate

Trip Blank –

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A0274411S

Sample Code (Name): GW53

Date and time: 16/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | – | 1130 | – | 13.9 | 6.90 | 745 | -124.5 | 1.70 | – | 7385.04 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**
Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☑ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Soldiers Road

Weather:

Sample point: tap / well / surface water

Description of sample point: Top of tank

Distance of sample point from bore: (m)

Sampling equipment: tap

QA/QA Sample Codes:

Duplicate

Trip Blank

Field Blank

Rinsate Blank (include description of equipment cleaned e.g. dipper)

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~

Sample Code (Name): GWSS

Date and time: 15.3.21

Coordinates: (NZTM) E

N

Sampled By: TH (Clean hands)

ST (Dirty hands)

Site Photos taken? ☑ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats Plenty

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | – | 12.59 | – | 14.6 | 7.42 | 980 | -108.5 | 3.69 | – | 5784.4 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Comments: Sampled from top of tank before water goes through iron filter. Field washdown. Switch on. Turn on hose for 4 days wash. Run for 5 mins. Tank drops down and pump automatically starts to refill

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☐ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: —

Address: Tangimoana Rd

Weather:

Sample point: tap / well / surface water

Description of sample point: Open Well

Distance of sample point from bore: (m)

Sampling equipment: Low Flow

QA/QA Sample Codes:

Duplicate —

Trip Blank —

Field Blank —

Rinsate Blank (include description of equipment cleaned e.g. dipper) —

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A0274415

Sample Code (Name): MW5

Date and time:

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BF (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | - | 0135 | CLM | 15.8 | 7.25 | 804 | -354.4 | 1.0 | 5.77 | 11.5 |
| During | 5 | 0140 | 0.1L | 15.4 | 7.03 | 803 | -344.0 | 0.17 | " | 9.18 |
| During | 10 | 0145 | 2 | 15.1 | 7.00 | 803 | -346.9 | 0.06 | " | 14.22 |
| During | 15 | 1350 | 4 | 15.1 | 6.99 | 802 | -348.9 | 0.03 | " | 17.25 |
| During | 20 | 1355 | 6 | 15.1 | 6.97 | 801 | -352.6 | 0.01 | " | 18.70 |
| During | 25 | 1400 | 8 | 15.1 | 6.95 | 803 | -354.6 | 0.00 | " | 22.64 |
| During | 30 | 1405 | 10 | 15.1 | 6.95 | 802 | -357.3 | -0.01 | " | 21.13 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments: SWL: 5.77m
DBR: 6.95
TOC - 0.57m agl

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**
Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | |
|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☐ No | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: ~~NZDF~~

Address: Bulls Quarry

Weather: Fine / breezy

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: tap

QA/QA Sample Codes:

Duplicate: –

Trip Blank: –

Field Blank: –

Rinsate Blank (include description of equipment cleaned e.g. dipper): –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A0C744118

Sample Code (Name): WS2

Date and time: 18/03/21

Coordinates (NZTM): E

N

Sampled By: JH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 0228 | – | 14.7 | 6.80 | 573 | -91.7 | 8.54 | – | 0.96 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Comments: Malcolm (spotless) for key - 021 915631
Alarm code: 6304

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☑ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: NZDF

Address: Fire Training Area

Weather: Fine

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: low flow

QA/QA Sample Codes:

Duplicate: -

Trip Blank: - QUKAV

Field Blank: -

Rinsate Blank (include description of equipment cleaned e.g. dipper): -

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A027444 117

Sample Code (Name): MW4

Date and time: 19/05/21

Coordinates: (NZTM) E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / (Non-potable)

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

8 x 3.141 x 40.3225 / 4000 + 1L
= 1.25 L per ~~sample~~ parameters.

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 0734 | 1L | 14.3 | 6.51 | 600 | -75.0 | 1.29 | ~~7~~.11 | 836.2 |
| During | 10 | 0744 | 2.4 | 14.7 | 6.47 | 600 | -214.1 | 0.63 | 7.11 | 2800 |
| During | 15 | 0749 | 3.8 | 14.8 | 6.52 | 600 | -230.6 | 0.41 | 7.11 | 913.75 |
| During | 20 | 0754 | 4.9 | 14.8 | 6.67 | 600 | -252.4 | 0.33 | 7.11 | 607.85 |
| During | 25 | 0759 | 6.1 | 14.8 | 6.58 | 600 | -254.6 | 0.28 | " | 650.8 |
| During | 30 | 0804 | 7.4 | 14.8 | 6.57 | 601 | -257.5 | 0.27 | " | 636.7 |
| During | 35 | 0809 | 8.7 | 14.8 | 6.58 | 601 | -260.2 | 0.26 | " | 647.06 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments: DTW: 7.105 bgl Top of PVC
DTB: 9.40m bgl
Top of PVC = ground level

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**
Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

Shake test – foam produced? ☐ Yes ☐ No

COC form completed and checked? ☐ Yes — Letter given to landowner? ☐ Yes

Location field sheet completed? ☐ Yes ☐ N/A — Well field sheet completed? ☐ Yes ☐ N/A

Stabilisation criteria field sheet completed? ☐ Yes

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: NZDF

Address:

Weather: Fine

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: Low Flow

QA/QA Sample Codes:

Duplicate –

Trip Blank SWKAV

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A02744417

Sample Code (Name): MW9

Date and time: 16/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 0742 | Cell | 16.6 | 7.45 | 330 | -154.5 | 3.42 | 2.235 | 368.91 |
| During | 0 | 0742 | Cell | 17.0 | 6.51 | 287.9 | -166.9 | 3.65 | 2.30 | 346.44 |
| During | 10 | 0752 | 1.8 | 17.2 | 6.22 | 290.3 | -209.4 | 1.30 | 2.415 | 39.84 |
| During | 30 | 0802 | 2.4 | 17.1 | 6.23 | 297 | -244.3 | 0.62 | 2.48 | 22.93 |
| During | 30 | 0812 | 3.6 | 17.5 | 6.31 | 311 | -266.5 | 0.40 | 2.56 | 29.08 |
| During | 40 | 0822 | 4.6 | 17.5 | 6.33 | 321 | -257.3 | 0.43 | 2.595 | 35.85 |
| During | 50 | 0832 | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Comments: DTW: 2.18 m below PVC
DTB: 4.46 m
PVC: Stamm bgl
Low Flow in water at start of purging. Emptied flow cell and tubing @ 0744
Quite a lot of drawdown

Analyses Required: PFAS suite

Serial number of water quality sensor unit: ✓

| | | | | |
|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☐ No | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: NZDF

Address: Base

Weather: Fine

Sample point: tap / well / surface water

Description of sample point: 38mm prezo

Distance of sample point from bore: (m)

Sampling equipment: Low Flow

QA/QA Sample Codes:

Duplicate: –

Trip Blank: –

Field Blank: –

Rinsate Blank (include description of equipment cleaned e.g. dipper): ✓

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A0274411 7

Sample Code (Name): MW6

Date and time: 17/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

4 x 3.141 x 40.3225 / 4000

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 0243 | Cell | 20.5 | 7.41 | 177.6 | -187.9 | 6.42 | 3.52 | 10.42 |
| During | 10 | 0253 | 1 L | 18.4 | 6.38 | 167.6 | -168.9 | 4.65 | 3.56 | 5.98 |
| During | 20 | 0303 | 2L | 18.5 | 6.32 | 165.3 | -168.9 | 4.48 | 3.59 | 4.58 |
| During | 30 | 0313 | 3 L | 18.2 | 6.30 | 164.6 | -168 | 4.33 | 3.64 | 4.21 |
| During | 40 | 0323 | 4.1 L | 18.2 | 6.28 | 164.8 | -167.4 | 4.18 | 3.65 | 4.25 |
| During | 50 | 0333 | | | | | | | | |
| During | 60 | 0343 | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments: DTW = 3.51
DTB = 4.46

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☐ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Bailey Rd

Weather:

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: tap

QA/QA Sample Codes:

Duplicate GWKAQ

Trip Blank GWKAR

Field Blank GWKAS

Rinsate Blank (include description of equipment cleaned e.g. dipper)

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A0274411 7

Sample Code (Name): WS1

Date and time: 17/03/21

Coordinates (NZTM): E

N

Sampled By: (Clean hands)

(Dirty hands)

Site Photos taken? ☐ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | – | 0744 | – | 12.9 | 7.92 | 445.1 | -90.7 | 9.13 | – | 1335.70 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Comments

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

Shake test – foam produced? ☐ Yes ☐ No

COC form completed and checked? ☐ Yes Letter given to landowner? ☐ Yes

Location field sheet completed? ☐ Yes ☐ N/A Well field sheet completed? ☐ Yes ☐ N/A

Stabilisation criteria field sheet completed? ☐ Yes

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: 3H1

Weather: Cloudy / Windy

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment:

QA/QA Sample Codes: –

Duplicate

Trip Blank –

Field Blank –

Rinsate Blank (Include description of equipment cleaned e.g. dipper) –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A027444 | 5

Sample Code (Name): GW57

Date and time: 15/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 1554 | – | 16.3 | 6.99 | 2186 | -116.6 | 3.52 | – | 33.62 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

left to run for approx 5min.

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

Shake test – foam produced? ☐ Yes ☑ No

COC form completed and checked? ☐ Yes

Location field sheet completed? ☐ Yes ☐ N/A

Stabilisation criteria field sheet completed? ☐ Yes

Letter given to landowner? ☐ Yes

Well field sheet completed? ☐ Yes ☐ N/A

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Taylor Road

Weather: cloudy

Sample point: tap / well / surface water

Description of sample point: well

Distance of sample point from bore: (m)

Sampling equipment: low flow

QA/QA Sample Codes:

Duplicate: -

Trip Blank: -

Field Blank: -

Rinsate Blank (include description of equipment cleaned e.g. dipper): -

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A02744115

Sample Code (Name): GW06

Date and time: 15/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

ST (Dirty hands)

Site Photos taken? ☐ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | 0 | 0728 | cell | 16.3 | 6.26 | 735 | -114.4 | 2.30 | 2.4m | 87.2 |
| During | 5 | 0730 | 1.5 L | 16.1 | 6.28 | 737 | -207.3 | 0.14 | 2.4m | 26.7 |
| During | | 7~~35~~ | 3.0 L | 16.0 | 6.27 | 736 | -270.5 | 0.11 | 2.4m | 17.5 |
| During | 15 | 0740 | 4.5 L | 16.0 | 6.25 | 740 | -304.8 | 0.08 | 2.4m | 20.46 |
| During | 20 | 0745 | 6.0 L | 16.0 | 6.24 | 741 | -327.3 | 0.06 | 2.4m | 27.8 |
| During | 25 | 0750 | 7.5 L | 16.0 | 6.23 | 740 | -339.9 | 0.05 | 2.4 | 37.6 |
| During | 30 | 0755 | 9.0 L | 16.1 | 6.25 | 741 | -349.3 | 0.04 | 2.4 | 51.55 |
| During | 35 | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments DTW 2.14m

DTB - 6.95m

PVC - TOC = 50mm Pump intake depth 5.5

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☑ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Taylors Road

Weather: Fine + Warm

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: low flow

QA/QA Sample Codes:

Duplicate —

Trip Blank GWKAL

Field Blank GWKAM

Rinsate Blank (include description of equipment cleaned e.g. dipper) GWKAR - dipper

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~

Sample Code (Name): GW108

Date and time: 15/09/21 2:30

Coordinates: (NZTM) E

N

Sampled By: (Clean hands)

(Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats —

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | 0 | 0156 | Cell | 18.6 | 6.98 | 410.6 | -135 | 3.29 | ~~1.725~~ | 15.47 |
| During | 5 | 0201 | 1L | 16.6 | 6.22 | 417.3 | -138.2 | 1.90 | 1.755 | 12.20 |
| During | 16 | 0206 | 2.5L | 16.4 | 5.30 | 454 | -160.4 | 1.39 | 1.77 | 8.30 |
| During | 16 | 0211 | 3.5L | 16.4 | 6.37 | 480.5 | +185.5 | 1.02 | 1.78 | 5.82 |
| During | 20 | 0216 | 4.5L | 16.4 | 6.37 | 481.6 | -197 | 0.90 | 1.79 | 5.2 |
| During | 25 | 0221 | 6L | 16.3 | 6.38 | 486.6 | -208.3 | 0.73 | 1.80 | 5.6 |
| During | 30 | 0226 | 7L | 16.3 | 6.37 | 491.4 | -215.5 | 0.64 | 1.80 | 5.25 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments DTW: 1.70 m
DTB: 3.86m
TOC: PVC = 40mm below TOC

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☐ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: —

Address: McDonnell Road

Weather: Fine + warm

Sample point: tap / well / surface water

Description of sample point: GW Well

Distance of sample point from bore: (m)

Sampling equipment: Low Flow

QA/QA Sample Codes: —

Duplicate

Trip Blank —

Field Blank —

Rinsate Blank (include description of equipment cleaned e.g. dipper) —

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A027444,17

Sample Code (Name): GW109

Date and time: 15/03/2021

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC (µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | 0 | 0300 | Cell | 19.3 | 6.41 | 392.3 | -210.7 | 1.88 | 4.655 | 47.06 |
| During | 5 | 0305 | 1.5 L | 15.8 | 6.37 | 388.4 | -217.9 | 0.17 | 4.66 | 41.06 |
| During | 10 | 0310 | 2.5 L | 15.9 | 6.30 | 388.3 | -270.8 | 0.10 | 4.66 | 28.48 |
| During | 15 | 0315 | 4 L | 15.5 | 6.19 | 385.4 | -285.9 | 0.06 | 4.66 | 25.49 |
| During | 20 | 0320 | 5.5 L | 15.5 | 6.07 | 385.9 | -298.6 | 0.024 | 4.65 | 32.65 |
| During | 25 | 0325 | 6.5 L | 15.4 | 5.99 | 386.5 | -301.4 | 0.03 | 4.66 | 4.70 |
| During | 30 | 0330 | 8 L | 15.4 | 5.94 | 386.2 | -303.6 | 0.04 | 4.66 | 5.40 |
| During | 35 | 0335 | 9.5 L | 15.4 | 5.89 | 386.7 | -304.9 | 0.02 | 4.66 | 5.29 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Comments DTW: 4.65 m
DTB: 7.83 m
PVC = 40mm below TOC

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | |
|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☐ No | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Bailey Road

Weather:

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: peri pump

QA/QA Sample Codes:

Duplicate: GWKAT

Trip Blank: -

Field Blank: -

Rinsate Blank (include description of equipment cleaned e.g. dipper): -

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: A02684802

Sample Code (Name): GWM.1

Date and time: 17/3/21 11:15

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☑ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

9.5

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 1115 | well | 15.6 | ~~6.88~~ | 329.1 | -208. | 7.25 | 7.665 | 74.1 |
| During | 5 | 1120 | 1.2 | 15.1 | 6.75 | 314.7 | ~~-208~~ -205 | 1.09 | 7.665 | 49.06 |
| During | 10 | 1125 | 2.4 | 15.1 | 6.64 | 306.8 | -277.7 | 0.96 | 7.665 | 56.25 |
| During | 15 | 1130 | 3.5 | 15.1 | 6.58 | 307.2 | -234.6 | 0.94 | 7.665 | 60.47 |
| During | 20 | 1135 | 4.8 | 15.1 | 6.55 | 306.0 | -236.3 | 0.93 | 7.669 | ~~29.26~~ 29.26.8 |
| During | 25 | 1140 | 6 | 15.1 | 6.52 | 305.1 | -238.6 | 0.94 | 7665 | 43.65 |
| During | 30 | 1145 | 7 | 15.1 | 6.50 | 304.4 | -238.8 | 0.87 | 7.665 | 24.36 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments: DTW = 7.66m
DTB = 11.24m

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

GWKAT_1_170321 → Dup GW11.1 (shallow)

TOC = 480mm above ground level

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☐ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Bailey Road

Weather:

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: Solinst - double pump.

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A0274411 7

Sample Code (Name): CW111.2

Date and time: 17/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☑ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

37.5 x 3.141 x 40.322 5 / 4000 = 1.2 L per reading

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 1023 | Cell/1L | 14.1 | 7.63 | 807 | -274.7 | 0.78 | 9.20 | 44.39 |
| During | 5 | 1028 | 4L | 13.8 | 7.17 | 853 | -308.2 | 0.30 | 9.20 | 17.05 |
| During | 10 | 1033 | 6.8L | 13.8 | 7.07 | 843 | -314.2 | 0.29 | 9.21 | 11.21 |
| During | 15 | 1038 | 9.0 L | 14.0 | 6.98 | 832 | -312.6 | 0.08 | 9.21 | 6.54 |
| During | 20 | 1043 | 10.7L | 14.0 | 7.05 | 823 | -327.8 | 0.02 | 9.20 | 7.12 |
| During | 25 | 1048 | 12.4 | 13.9 | 7.03 | 811 | -331.5 | 0.00 | 9.20 | 6.66 |
| During | 30 | 1053 | 14.5 | 13.9 | 7.02 | 803 | -334.8 | 0.00 | 9.20 | 6.63 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments DTW = 9.20

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

30 PSI, 8L Done, 10 vols = 1.7 - 2.5 L per 5 min.

TOC ~490 mm above ground level

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☑ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Bailey Road

Weather: Fine

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: Solinst

QA/QA Sample Codes:

Duplicate: –

Trip Blank: –

Field Blank: –

Rinsate Blank (include description of equipment cleaned e.g. dipper): –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A027444117

Sample Code (Name): GW111.3

Date and time: 17/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☑ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

80 x 3.141 x 40.3225 / 4000

2.5 L

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC (µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 0820 | Cell | 15.6 | 8.31 | 503 | -92.1 | 2.30 | 6.80 | 55.74 |
| During | 5 | 0825 | 1 L | 15.0 | 7.24 | ~~786~~ | -143.2 | 3.41 | 6.82 | 127.4 |
| During | 10 | 0830 | 2 L | 14.4 | 7.00 | 787 | -177 | 1.71 | 6.91 | 31.92 |
| During | 20 | 0840 | 3.7 L | 14.9 | 6.77 | 797 | -208.4 | 0.88 | 6.81 | 13.08 |
| During | 30 | 0850 | 4.0 L | 16.8 | 6.52 | 799 | -184.7 | 1.93 | 6.81 | 8.11 |
| During | 40 | 0900 | 5.0 | 15.7 | 6.72 | 749 | -218.7 | 0.80 | 6.81 | 125.6 |
| During | 50 | 0910 | 7.0 | 15.4 | 7.34 | 802 | -256.5 | 0.40 | 6.81 | 99.95 * |
| During | 65 | 0925 | 9.5 | 14.6 | 7.71 | 801 | -304.3 | 0.10 | 6.81 | 81.18 |
| During | 75 | 0935 | 12.0 | 14.1 | 7.87 | 810 | -328.4 | 0.03 | 6.81 | 16.64 |
| During | 85 | 0945 | 15.5 | 14.0 | 7.93 | 812 | -340.1 | 0.02 | 6.81 | 7.15 |
| During | 95 | 0955 | 19 L | 13.9 | 7.96 | 805 | -304.2 | 0.22 | 6.81 | 5.47 |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments: DTW: 6.775 below TOC

TOC = 500mm ag

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

* Changed from using sample line, adaptor on well cap to connecting sample line to silicon tubing to stop air coming through from with water

50PSI Drive 30 sec Vent 6 sec = ~ 4L per 10 mins.

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☐ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Speedy Road

Weather:

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: – (m)

Sampling equipment: low flow

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A02744115

Sample Code (Name): GW112.1

Date and time: 18.3.21

Coordinates (NZTM): E

N

Sampled By: RW (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

6 x 3.14 x 40.3225 / 4000

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 0130 | Cell | 19.5 | 7.64 | 443 | -188.5 | 3.28 | 2.095 | 16.457 |
| During | 5 | 0135 | 1L | 16.3 | 6.53 | 406 | -214.3 | 0.88 | " | 24.24 |
| During | 10 | 0140 | 2.5L | 16.0 | 6.39 | 411.8 | -274.5 | 0.35 | " | 50.79 |
| During | 15 | 0145 | 4L | 16.2 | 6.36 | 410.8 | -296 | 0.20 | " | 47.93 |
| During | 20 | 0150 | 5.5L | 16.1 | 6.32 | 409.9 | -305.3 | 0.12 | " | 70.42 |
| During | 25 | 0155 | 7L | 16.0 | 6.30 | 409.7 | -319.9 | 0.08 | " | 81.32 |
| During | 30 | 0200 | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments DTW = 2.005 m below top of PVC

Riser: DTB = 10.35

Top of PVC = 0.55 mm agl

Pump intake @ 6m

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**
Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☑ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Speedy Rd

Weather: Fine & Breezy

Sample point: tap / well / surface water

Description of sample point: -

Distance of sample point from bore: - (m)

Sampling equipment: Solinst

QA/QA Sample Codes:

Duplicate -

Trip Blank -

Field Blank -

Rinsate Blank (include description of equipment cleaned e.g. dipper) -

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ 402748115

Sample Code (Name): GWH2.2

Date and time: 18/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

50m x 3.141 x 40.3225 / 4000
= 2.5L per sample train.

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | | 1232 | Cell | 16.7 | 8.04 | 885 | -66.5 | 1.20 | 1.92 | 75.49 |
| During | 5 | 1237 | 2L | 15.1 | 7.33 | 1049 | -243 | 0.12 | 1.92 | 49.21 |
| During | 10 | 1242 | 4L | 15.0 | 7.37 | 983 | -306 | 0.07 | 1.92 | 9.15 |
| During | 15 | 1247 | 6L | 14.9 | 7.37 | 952 | -339.6 | 0.03 | 1.92 | 10.20 |
| During | 20 | 1252 | 8L | 14.9 | 7.37 | 948 | -357.2 | 0.06 | 1.92 | 11.42 |
| During | 25 | 1257 | 10L | 14.9 | 7.37 | 945 | -369.9 | -0.01 | 1.92 | 18.0 |
| During | 30 | 102 | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments PID 1.9 6m below Top of PVC
Top of PVC = 1.08m agl

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

PSI = 20 Pump = 10 sec Vent = 3 sec

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

Shake test – foam produced? ☐ Yes ☑ No

COC form completed and checked? ☐ Yes

Location field sheet completed? ☐ Yes ☐ N/A

Stabilisation criteria field sheet completed? ☐ Yes

Letter given to landowner? ☐ Yes

Well field sheet completed? ☐ Yes ☐ N/A

* = needs to be recorded each time you take a set of parameters

**NZDF PFAS SAMPLING FORM** (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: F-

Address: Tagler Road

Weather: Fine / Cloudy

Sample point: tap / well / surface water

Description of sample point: Stream off Tagler Rd

Distance of sample point from bore: (m)

Sampling equipment: Mighty Gripper

QA/QA Sample Codes:

Duplicate

Trip Blank: CHCAP

Field Blank: ~~CHCAP~~

Rinsate Blank (include description of equipment cleaned e.g. dipper): CHCAP

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ AU274415

Sample Code (Name): SW33

Date and time: 16/03/2021

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BJ (Dirty hands)

Site Photos taken? ☐ Yes ☑ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats —

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | — | 0835 | — | 15.9 | 6.91 | 498.3 | -109.0 | 2.25 | — | 6.60 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | |
|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☑ No | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | |

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: —

Address: Campbell Road

Weather: Cloudy / Sunny

Sample point: tap / well / surface water

Description of sample point: Makarora, Stream - upstream from Rangitikei Confluence

Distance of sample point from bore: (m)

Sampling equipment: —

QA/QA Sample Codes:

Duplicate: —

Trip Blank: —

Field Blank: —

Rinsate Blank (include description of equipment cleaned e.g. dipper): —

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A0274415

Sample Code (Name): SJ36

Date and time: 16/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☐ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | — | 15.54 | — | 15.4 | 7.37 | 726 | -20.5 | 1.96 | — | 1.49 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

Shake test – foam produced? ☐ Yes ☐ No

COC form completed and checked? ☐ Yes

Letter given to landowner? ☐ Yes

Location field sheet completed? ☐ Yes ☐ N/A

Well field sheet completed? ☐ Yes ☐ N/A

Stabilisation criteria field sheet completed? ☐ Yes

* = needs to be recorded each time you take a set of parameters

## NZDF PFAS SAMPLING FORM (separate form for each primary sample)

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner:

Address: Access of Fagan Road

Weather: Fine

Sample point: tap / well / surface water

Description of sample point:

Distance of sample point from bore: (m)

Sampling equipment: Mighty Gripper

QA/QA Sample Codes:

Duplicate –

Trip Blank –

Field Blank –

Rinsate Blank (include description of equipment cleaned e.g. dipper) –

**NOTE: purge until well has stabilised using field parameters below (3 consecutive readings)**

Job Number: ~~A02684802~~ A0274417

Sample Code (Name): SW4

Date and time: 18/03/21

Coordinates (NZTM): E

N

Sampled By: TH (Clean hands)

BT (Dirty hands)

Site Photos taken? ☑ Yes ☐ No

Water use: Drinking water / Stock watering / Fodder irrigation / Non-potable

Animals observed on site: Chickens / cows / sheep / pigs / goats

**Minimum volume between readings: 1 sample train volume (see formula below)**

**Key Stabilisation Criteria:**
**pH ± 0.1, EC ± 3%, T ± 3%, turbidity ± 10% of prior reading and ± 10 for values greater than 10 NTU**

TRANSFER FINAL READINGS TO STABILISATION FIELD SHEET

| | Time Elapsed | Time | Volume Removed (L) | Water Temp. (°C) | pH | EC ((µS/cm) | ORP (mV) | Dissolved Oxygen (mg/L) | Water Level (m)* | Turbidity (NTU) / Water Appearance† |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | – | 10:30 | – | 13.2 | 7.03 | 581 | -46.5 | 4.54 | – | 15.18 |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |
| During | | | | | | | | | | |

† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

**Sample Train Volume Calculation (L)**
(length of sample tube x 3.141 x $d^2$ / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Comments: Stream very low. Pools not connected with flowing water

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

| | | | | | |
|---|---|---|---|---|---|
| Shake test – foam produced? | ☐ Yes | ☑ No | | | |
| COC form completed and checked? | ☐ Yes | | Letter given to landowner? | ☐ Yes | |
| Location field sheet completed? | ☐ Yes | ☐ N/A | Well field sheet completed? | ☐ Yes | ☐ N/A |
| Stabilisation criteria field sheet completed? | ☐ Yes | | | | |

* = needs to be recorded each time you take a set of parameters

# Appendix E: QA/QC Sample Results

**Table E-1: QA/QC Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS)** [1]

| Sample Location | GW111.1 | GW111.1 | %RPD (GW111.1 and GWKAT) | GW111.1 | GW111.1 | %RPD (GW111.1 and GWKAT) | WS1 | WS1 | %RPD (WS1 and GWKAQ) |
|---|---|---|---|---|---|---|---|---|---|
| Sample Name | OHA_BAI_GW111.1_1_170321 | OHA_BAI_GWKAT_1_170321 | | OHA_BAI_GW111.1_1_170321 [2] | OHA_BAI_GWKAT_1_170321 [2] | | OHA_FTA_WS1_5_170321 | OHA_ADJ_GWKAQ_1_170321 | |
| Laboratory Reference | 2390370 | 2390370 | | 2390370 | 2390370 | | 2318531 | 2318531 | |
| Monitoring Zone | On base | On base | | On base | On base | | On base | On base | |
| Sampled Date | 17/03/2021 | 17/03/2021 | | 17/03/2021 | 17/03/2021 | | 17/03/2021 | 17/03/2021 | |
| PFPrS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | 0.013 | 0.013 | 0 |
| PFBS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | 0.026 | 0.027 | 4 |
| PFPeS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | 0.024 | 0.024 | 0 |
| di-PFHxS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| Mono-PFHxS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | 0.033 | 0.032 | 3 |
| L-PFHxS | 0.083 | 0.086 | 4 | 0.082 | 0.086 | 5 | 0.13 | 0.13 | 0 |
| Total PFHxS | 0.083 | 0.086 | 4 | 0.082 | 0.086 | 5 | 0.16 | 0.16 | 0 |
| PFHpS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | 0.0018 | 0.002 | 11 |
| di-PFOS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | 0.0029 | 0.0028 | 4 |
| Mono-PFOS | 0.035 | 0.035 | 0 | 0.038 | 0.033 | 14 | 0.019 | 0.022 | 15 |
| L-PFOS | 0.05 | 0.053 | 6 | 0.054 | 0.052 | 4 | 0.011 | 0.0088 | 22 |
| Total PFOS | 0.085 | 0.088 | 3 | 0.092 | 0.085 | 8 | 0.033 | 0.034 | 3 |
| Sum of PFHxS and PFOS | 0.17 | 0.17 | 0 | 0.17 | 0.17 | 0 | 0.19 | 0.19 | 0 |
| PFNS | <0.05 | <0.05 | 0 | <0.05 | <0.05 | 0 | <0.001 | <0.001 | 0 |
| PFDS | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | - | - | - |
| PFECHS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| PFBA | 0.11 | <0.1 | 10 | 0.11 | 0.11 | 0 | 0.018 | 0.019 | 5 |
| PFPeA | 0.39 | 0.39 | 0 | 0.41 | 0.37 | 10 | 0.089 | 0.1 | 12 |
| PFHxA | 0.28 | 0.25 | 11 | 0.26 | 0.25 | 4 | 0.082 | 0.087 | 6 |
| PFHpA | 0.15 | 0.15 | 0 | 0.17 | 0.13 | 27 | 0.03 | 0.03 | 0 |
| PFOA | 0.073 | 0.072 | 1 | 0.076 | 0.069 | 10 | 0.024 | 0.025 | 4 |
| PFNA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | 0.0065 | 0.0071 | 9 |
| PFDA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| PFUnDA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| PFTrDA | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | - | - | - |
| PFTeDA | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | - | - | - |
| PFDoDA | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | <0.001 | <0.005 | 0 |
| FOSA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| MeFOSA | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | - | - | - |
| MeFOSAA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| EtFOSAA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| 4:2 FTS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| 6:2 FTS | <0.05 | <0.05 | 0 | <0.05 | <0.05 | 0 | 0.1 | 0.11 | 10 |
| 8:2 FTS | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | <0.001 | <0.001 | 0 |
| 10:2 FTS | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| FPrPA | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | <0.001 | <0.001 | 0 |
| MeFOSE | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | - | - | - |
| EtFOSA | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | - | - | - |
| EtFOSE | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | - | - | - |
| FPePA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| FHpPA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| 11Cl-PF3OUdS | <0.05 | <0.05 | 0 | <0.05 | <0.05 | 0 | <0.001 | <0.001 | 0 |
| HFPO-DA* | <0.05 | <0.05 | 0 | <0.05 | <0.05 | 0 | <0.001 | <0.001 | 0 |
| Sum F-53B | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | <0.001 | <0.001 | 0 |
| ADONA | <0.025 | <0.025 | 0 | <0.025 | <0.025 | 0 | <0.001 | <0.001 | 0 |
| P37DMOA | <0.05 | <0.05 | 0 | <0.05 | <0.05 | 0 | <0.001 | <0.001 | 0 |
| 9Cl-PF3ONS | <0.1 | <0.1 | 0 | <0.1 | <0.1 | 0 | <0.001 | <0.001 | 0 |

Notes:

1. Results in µg/L.
2. Retention portion

| | |
|---|---|
| - | No value available |
| <0.001 | Below the limit of reporting |

**Table E-2: QA/QC Water Sampling Results - Blanks - Per- and Poly-Fluoroalkyl Substances (PFAS)** [1]

| Sample Name | OHA_ADJ_GWKAM_1_150321 | OHA_FTA_GWKAS_1_170321 | OHA_ADJ_GWKAN_1_150321 | OHA_ADJ_GWKAO_1_160321 | OHA_ADJ_GWKAL_1_150321 | OHA_ADJ_GWKAV_1_180321 | OHA_ADJ_GWKAP_1_160321 | OHA_FTA_GWKAR_1_170321 | OHA_SHW_SWKAU_1_180321 |
|---|---|---|---|---|---|---|---|---|---|
| Laboratory Reference | 2313652 | 2318531 | 2313652 | 2316431 | 2313652 | 2314824 | 2316431 | 2318531 | 2327926 |
| Sample Date | 15/03/2021 | 17/03/2021 | 15/03/2021 | 16/03/2021 | 15/03/2021 | 18/03/2021 | 16/03/2021 | 17/03/2021 | 18/03/2021 |
| Sample Type | Field Blank | Field Blank | Rinsate Blank | Rinsate Blank | Trip Blank | Trip Blank | Trip Blank | Trip Blank | Trip Blank |
| PFPrS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFBS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFPeS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| di-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| Mono-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| L-PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| Total PFHxS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFHpS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| di-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| Mono-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| L-PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| Total PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| Sum of PFHxS and PFOS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFNS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | <0.001 | <0.005 |
| PFDS | - | - | - | - | - | <0.1 | - | - | <0.01 |
| PFECHS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFBA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.1 | <0.002 | <0.001 | <0.001 |
| PFPeA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.1 | <0.001 | <0.001 | <0.001 |
| PFHxA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFHpA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFOA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFNA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFDA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFUnDA | - | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| PFTrDA | - | - | - | - | - | <0.1 | - | - | - |
| PFTeDA | - | - | - | - | - | <0.1 | - | - | - |
| PFDoDA | <0.001 | <0.001 | - | <0.001 | <0.001 | <0.1 | <0.001 | <0.001 | - |
| FOSA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| MeFOSA | - | - | - | - | - | <0.1 | <0.001 | - | - |
| MeFOSAA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| EtFOSAA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| 4:2 FTS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| 6:2 FTS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | <0.001 | <0.001 |
| 8:2 FTS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.1 | <0.001 | <0.001 | <0.001 |
| 10:2 FTS | - | <0.001 | - | - | - | <0.025 | <0.001 | <0.001 | - |
| FPrPA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.1 | <0.001 | <0.001 | <0.001 |
| MeFOSE | - | - | - | - | - | <0.1 | <0.001 | - | - |
| EtFOSA | - | - | - | - | - | <0.1 | <0.001 | - | - |
| EtFOSE | - | - | - | - | - | <0.1 | <0.001 | - | - |
| FPePA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| FHpPA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| 11Cl-PF3OUdS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | <0.001 | <0.001 |
| HFPO-DA* | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | <0.001 | <0.001 |
| Sum F-53B | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.1 | <0.001 | <0.001 | <0.001 |
| ADONA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.025 | <0.001 | <0.001 | <0.001 |
| P37DMOA | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.05 | <0.001 | <0.001 | <0.001 |
| 9Cl-PF3ONS | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.1 | <0.001 | <0.001 | <0.001 |

Notes:
1. Results in µg/L.

| | |
|---|---|
| - | No value available |
| <0.001 | Below the limit of reporting |

## Appendix F: Spatial Plots of October 2020, and March 2021 Results

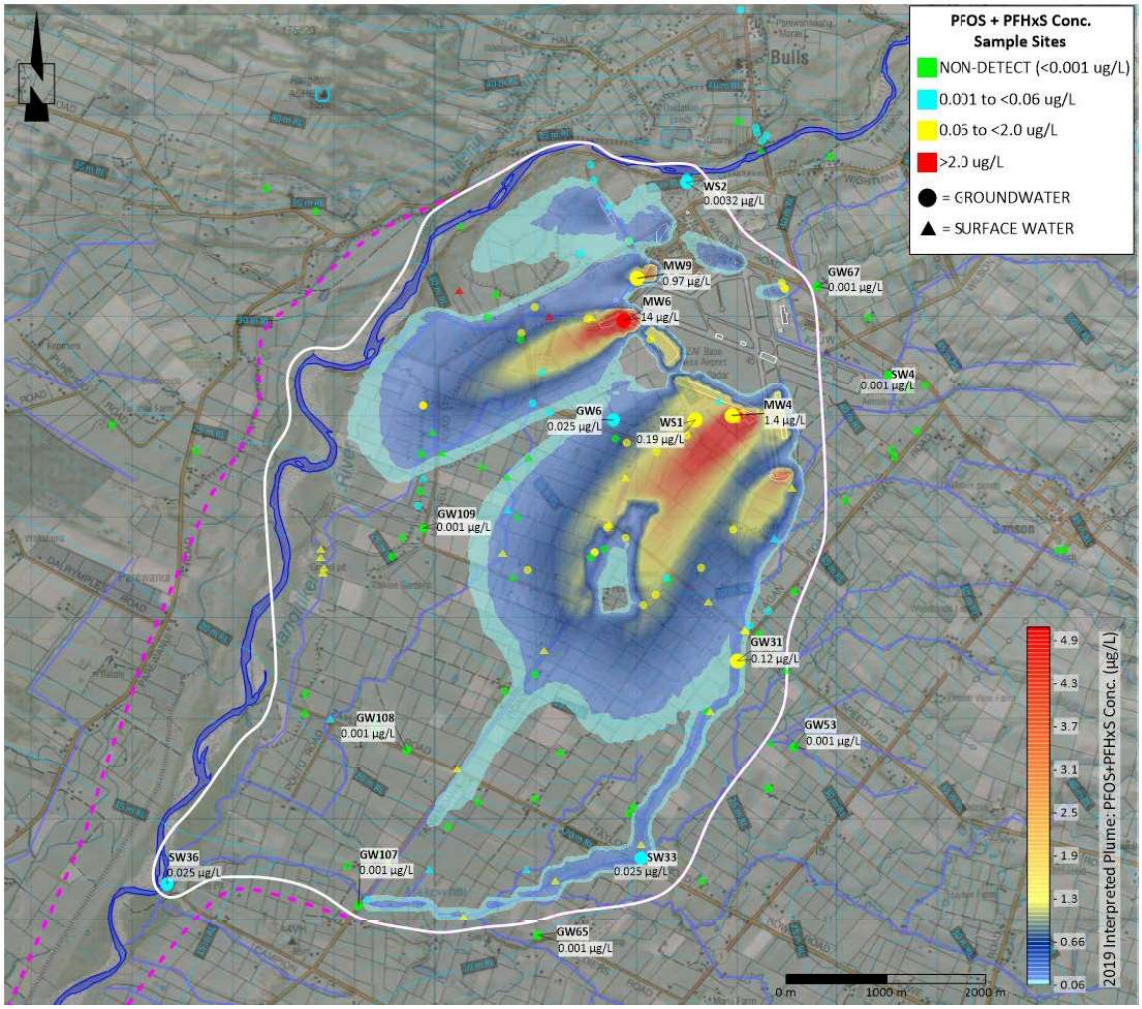


**Figure F-1: Results for October 2020 monitoring round (Sum of PFOS+PFHxS), overlayed on the interpreted shallow groundwater PFOS+PFHxS plume (no retardation) (PDP, 2019)**

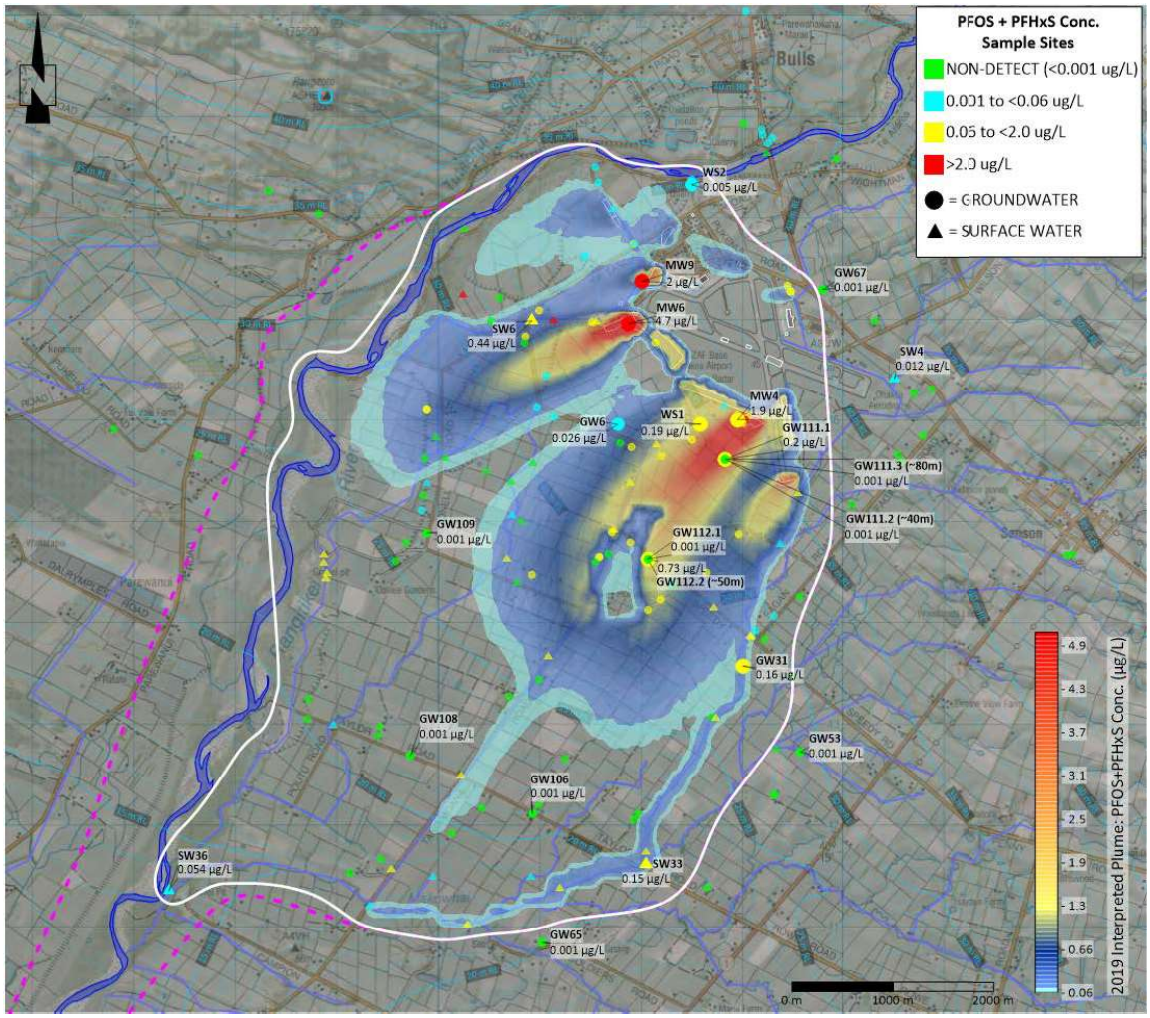


**Figure F-2: Results for March 2021 monitoring round (Sum of PFOS+PFHxS), overlayed on the interpreted shallow groundwater PFOS+PFHxS plume (no retardation) (PDP, 2019)**


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