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Dear Kate and Huma

ŌHAKEA: SURFACE WATER AND GROUNDWATER MONITORING FOR PFAS, NOVEMBER 2023

1.0 Introduction

Monitoring for per- and polyfluoroalkyl substances (PFAS) concentrations in groundwater and surface water was conducted between 7 and 10 November 2023 in accordance with the RNZAF Base Ōhakea PFAS Investigation: Long Term Monitoring Plan (LTMP) (PDP, 2020a). This is the seventh round of monitoring following the implementation of the LTMP (PDP, 2020a). Previous monitoring rounds, undertaken in October 2020, March 2021, October 2021, March 2022, September 2022, and April 2023 are reported in PDP (2020b), PDP (2021), PDP (2022a), PDP (2022b), PDP (2023a) and PDP (2023b) respectively.

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 (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 8 quality assurance/quality control (QA/QC) samples, including analysis of two duplicate samples; and
- Preparation of this report.

This letter reports the results of the monitoring undertaken at RNZAF Base Ōhakea ("Ōhakea" or the "base") at these sample locations, including a comparison with the findings of previous monitoring rounds (PDP, 2020b; PDP, 2021; PDP, 2022a; PDP, 2022b; PDP, 2023a; PDP 2023b).

2.0 Methodology

2.1 Sampling Methodology

Sampling was undertaken by PDP field staff between 7 and 10 November 2023. Sampling was undertaken in accordance with the procedures in the draft guidance document Sampling and Analysis of Per- and Poly-fluorinated Substances (Ministry for the Environment (MfE), 2018).

All samples were couriered to AsureQuality laboratory under standard 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 A.

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		HRC Bore ID	Sampling Point	Rationale	Sampled
RNZAF Base Ōhakea	MW4	323153	Monitoring Well	Key source area (historic fire training area (FTA)).	07/11/23
	WS1	323085	Tap	Farm bore downgradient of FTA and near site boundary with a long existing monitoring record.	09/11/23
	GW6	-	Well	Open well downgradient of key source areas and historically elevated PFAS concentrations.	09/11/23
	MW6	-	Monitoring Well	Key source area (run-up pit).	07/11/23
	MW9	-	Monitoring Well	Key source area (diversion tank for hangar deluge systems).	07/11/23
	WS2	313096	Tap	North-western plume edge (base drinking water supply).	08/11/23
	GW111.1	323183	Monitoring Well	Downgradient of FTA.	10/11/23
	GW111.2	323185	Monitoring Well	Downgradient of FTA. Deeper well (~40 m) to monitor the vertical extent of PFAS.	10/11/23
	GW111.3	323187	Monitoring Well	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.	10/11/23

Table 1: Groundwater Monitoring Locations

Location		HRC Bore ID	Sampling Point	Rationale	Sampled
Other (non-NZDF) private and public land	GW67	323173	Tap	North-eastern plume edge.	09/11/23
	GW31	323091	Tap	Eastern plume edge.	09/11/23
	GW53	-	Tap	Eastern plume edge.	08/11/23
	GW65	323019	Tap	Southern plume edge.	09/11/23
	GW106	323175	Monitoring Well	Plume is predicted to approach and then encompass the shallow well into the future.	09/11/23
	GW107	323177	Monitoring Well	Act as a sentinel monitoring location e.g., to monitor the predicted maximum lateral edge of the future plume.	09/11/23
	GW108	323179	Monitoring Well	Plume is predicted to approach and then encompass the shallow well into the future.	09/11/23
	GW109	323181	Monitoring Well	Plume is predicted to approach and then encompass the shallow well into the future.	09/11/23
	GW112.1	-	Monitoring Well	Well near the centre of the main plume.	08/11/23
	GW112.2	-	Monitoring Well	Well near the centre of the main plume. Deeper well (~55 m) to monitor the vertical extent of PFAS.	08/11/23

Table 2: Surface Water Monitoring Locations

Location	Rationale	Sampled
SW6	Previous high PFAS concentrations leaving the base.	07/11/23
SW33	Resurgence of high PFAS concentrations on the Makowhai Stream downstream of the base. Accessible from the road.	08/11/23
SW36	Makowhai Stream just upstream from confluence with the Rangitikei River. To assess the maximum extent of PFAS in the Makowhai Stream.	08/11/23
SW4	Upstream location to assess whether PFAS is present in the Makowhai Stream before entering the base boundary.	08/11/23

2.2 Field Measurements

2.2.1 Water Level Measurements

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

Pressure transducer loggers were installed in all five of the nested wells (GW111.1, GW111.2, GW111.3, GW112.1 and GW112.2) during the October 2021 monitoring round, to continuously record groundwater pressures (levels) in the monitoring wells. The logger data was downloaded during the November 2023 monitoring round.

The vertical heights of the monitoring wells were surveyed relative to a common datum by Cuttriss Consultants Limited during the November 2023 round to allow for an accurate assessment and comparison of the groundwater levels within each well.

Time series plots of the water level in each of the five wells relative to the surveyed hights of the wells are provided in Appendix B[1]. In summary, the data indicates that there is an upward groundwater gradient with the loggers installed in the deeper aquifer (wells GW111.3 and GW112.2) recording a higher relative pressure compared to the shallower aquifer (wells GW111.1, GW111.2 and GW112.1). This upward hydraulic gradient was an assumption in the PFAS groundwater model (PDP, 2019) developed for the area. Due to this upward gradient, it considered unlikely that PFAS compounds present in the shallow aquifer would be able to migrate into the deeper aquifer. It is important to note here however, that groundwater abstraction (e.g., for irrigation) could create localised areas of downward hydraulic gradient.

2.2.2 Field Parameters

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

2.3 Antecedent Weather Conditions and Flow Conditions

The preceding two weeks had a cumulative rainfall of 42.9 mm. The majority of this rain (32.4 mm) fell on three separate days prior to the commencement of sampling (Friday 03 November, 7.1 mm; Friday 27 October, 10.7 mm; Wednesday 25 October, 7.1 mm). On the first day of sampling (7 November), 7.3 mm of rain fell. The Rangitikei River and surrounding streams where surface water samples were collected were clear during the sampling round. The stream at SW4 and the drain at SW6 were observed to be flowing which allowed for samples to be collected.

2.4 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).

[1] Due to logger malfunctions, there is some missing data for some of the time periods. The malfunctioning loggers were sent back to the manufacturer (Solinst) for data retrieval. Replacement loggers have been installed, however in one instance, the replacement logger has malfunctioned and has been sent to Solinst.

- Two field blank samples.
- Two trip blank samples.

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

3.0 Sample Results and Comparison to Selected Guideline Values

3.1 Selected Guidelines Values

Table 3 below shows the reference guideline values against which the results have been compared.

The *Water Services (Drinking Water Standards for New Zealand) Regulations 2022* came into effect on 14 November 2022. The updated standards include maximum allowable values (MAVs) for PFOA and the sum of PFOS+PFHxS. These MAVs are the same as the guideline values previously used in this monitoring report, therefore the PFOA and Sum of Total PFOS + PFHxS guideline concentrations have not changed from criterion in previous reports. The reference in Table 3 has been updated to reflect these new standards.

The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG) (2018) draft default guideline values (DGVs) for PFOS in freshwater for 99%, 95%, 90% and 80% species protection were updated in May 2023[2]. The draft DGVs for PFOA have not been updated. The updated draft DGVs have increased compared to the previous values. The draft DGVs and the reference in Table 3 has been updated to reflect these new guidelines.

The draft PFAS National Environmental Management Plan (NEMP) version 3.0 was released (November 2022) for consultation (HEPA, 2022). The relevant guidelines provided in the current version 2.0 of the NEMP are the same as those provided in the draft version 3.0. For the purposes of this report, the current NEMP version 2.0 is used, the ecological water quality guideline values provided in Table 5 of the NEMP 3.0 (HEPA, 2022) recommend a comparison to the ANZG (formerly ANZECC) exposure scenario for 99% species protection for slightly to moderately disturbed ecosystems. Therefore, the results from the November 2023 monitoring round have also been compared to the 99% species protection values. This is a more conservative guideline value than has historically been used in previous reports, first being used for comparison in the September 2022 monitoring round. The recently updated draft DGV for 99% species protection for Total PFOS is 0.0091 µg/L[3].

[2] https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/draft-pfos-fresh-2023

[3] The previous draft DGV for 99% species protection for Total PFOS was 0.00023 µg/L.

Table 3: 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	-	-	Drinking water standard [1]
Ecological Freshwater Guideline 95% ecosystem protection	-	220 µg/L [2]	-	0.48 µg/L [3]	ANZG
Ecological Freshwater Guideline – 99% ecosystem protection	-	19 µg/L [2]	-	0.0091 µg/L [3]	ANZG

Notes:

1. *Water Services (Drinking Water Standards for New Zealand) Regulations 2022, for PFOA, and Sum of Total PFOS + PFHxS.*
2. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values* as reproduced in *PFAS National Environmental Management Plan Version 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.*
3. *ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.*

3.2 Sample Results and Comparison to Guideline Values

The analysis and discussion of sample results relates to concentrations of total perfluorooctane sulfonate (PFOS), total perfluorohexane sulfonate (PFHxS), the Sum of Total PFOS + PFHxS and perfluorooctanoic acid (PFOA), these are the compounds for which there is an applicable New Zealand and/or Australian guideline. When discussed as a collective, these will herein be referred to as 'the core PFAS compounds'. The sample analytical results for the core PFAS compounds are presented in Tables 4 and 5 with sample locations and results shown in Figure 2.

3.2.1 Groundwater Monitoring Wells

The results of the laboratory analyses for the core PFAS compounds in groundwater samples collected in November 2023 are provided in Table 4. PFAS results from all sampling rounds, and for all compounds in the laboratory PFAS suite, are presented in Table E-1, Appendix E.

Table 4: Groundwater Monitoring Results (November 2023 Sampling Round)

	Core PFAS Compounds (µg/L)		
Location	**Sum of Total PFOS + PFHxS**	**PFOA**	**Total PFOS**
WS1	0.24	0.031	0.055
WS2	0.0062	0.0014	0.0030
MW4	2.4	0.26	1.9
GW6	0.034	0.0027	0.014
MW6	13	0.84	7.5
MW9	1.3	0.33	0.72
GW111.1	0.23	0.069	0.14
GW111.2	<0.0010	<0.0010	<0.0010
GW111.3	<0.0010	<0.0010	<0.0010
GW31	0.096	0.013	0.032
GW53	<0.0010	<0.0010	<0.0010
GW65	<0.0010	<0.0010	<0.0010
GW67	<0.0010	<0.0010	<0.0010
GW106	<0.0010	<0.0010	<0.0010
GW107	<0.0010	<0.0010	<0.0010
GW108	<0.0010	<0.0010	<0.0010
GW109	<0.0010	<0.0010	<0.0010
GW112.1	0.51	0.085	0.24
GW112.2	<0.0010	<0.0010	<0.0010
Guideline Values	**Sum of Total PFOS + PFHxS**	**PFOA**	**Total PFOS**
Drinking Water [1]	0.07 µg/L	0.56 µg/L	-
Ecological Freshwater Guideline 95% ecosystem protection [2]	-	220 µg/L [2]	0.48 µg/L [3]
Ecological Freshwater Guideline 99% ecosystem protection [2]	-	19 µg/L [2]	0.0091 µg/L [3]

Notes:

1. *Water Services (Drinking Water Standards for New Zealand) Regulations 2022 (June 2022).*
2. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values* as reproduced in *PFAS National Environmental Management Plan Version 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.*
3. *ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.*

For the November 2023 monitoring round a total of 19 groundwater samples were collected. The analytical results are summarised as follows:

- The Sum of Total PFOS + PFHxS was reported above the NZ Drinking Water Standard of 0.07 µg/L at seven locations. These were: WS1 (0.24 µg/L), MW4 (2.4 µg/L), MW6 (13 µg/L), MW9 (1.3 µg/L), GW111.1 (0.23 µg/L), GW31 (0.096 µg/L) and GW112.1 (0.51 µg/L). None of these wells are currently used for drinking water supply.
- PFOA exceed the drinking NZ Drinking Water Standard of 0.56 µg/L in one monitoring well (MW6, 0.84 µg/L). This well is not a drinking water supply well.
- Total PFOS exceeded the ANZG for the protection of 99% of freshwater species (0.0091 µg/L) in eight locations. These were: WS1 (0.055 µg/L), MW4 (1.9 µg/L), GW6 (0.014 µg/L), MW6 (7.5 µg/L), MW9 (0.72 µg/L), GW111.1 (0.14 µg/L), GW31 (0.032 µg/L), and GW112.1 (0.24 µg/L).
- Total PFOS samples exceeded the ANZG for the protection of 95% of freshwater species (0.48 µg/L) at three locations. These were: MW4 (1.9 µg/L), MW6 (7.5 µg/L) and MW9 (0.72 µg/L).
- No groundwater samples contained PFOA above the ANZG for the protection of 99% of freshwater species.
- The core PFAS compounds were detected at concentrations above the laboratory limit of reporting (LOR) but below the relevant guideline values at two locations, WS2 and GW6.
- The core PFAS compounds were not reported (i.e., below the laboratory LOR) at ten locations (GW111.2, GW111.3, GW53, GW65, GW67, GW106, GW107, GW108, GW109, and GW112.2).

3.2.2 Surface Water

The results of the laboratory analyses for the core PFAS compounds in surface water samples collected in November 2023 are provided in Table 5. PFAS results from all sampling rounds, and for all compounds in the laboratory PFAS suite, are presented in Table E-2, Appendix E.

Table 5: Surface Water Monitoring Results (November 2023 Sampling Round)

	Core PFAS Compounds (µg/L)		
Location	**Sum of Total PFOS + PFHxS**	**PFOA**	**Total PFOS**
SW4	<0.0010	<0.0010	<0.0010
SW6	2.3	0.34	1.2
SW33	0.18	0.022	0.11
SW36	0.062	0.0088	0.032
Guideline Values	**Sum of Total PFOS + PFHxS**	**PFOA**	**Total PFOS**
Ecological Freshwater Guideline 95% ecosystem protection [1]	-	220 µg/L [1]	0.48 µg/L [2]
Ecological Freshwater Guideline 99% ecosystem protection [1]	-	19 µg/L [1]	0.0091 µg/L [2]

Notes:

1. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values* as reproduced in *PFAS National Environmental Management Plan Version 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.*
2. *ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.*

For the November 2023 monitoring round four surface water samples were collected. The analytical results are summarised as follows:

- SW6, SW33 and SW36 reported concentrations of total PFOS above the ANZG for the protection of 99% of freshwater species.
- The concentration of Total PFOS in SW6 (0.9 µg/L) also exceeded the 95% protection scenario. The 95% protection scenario is considered the most relevant guideline at the location of SW6 as this is a stormwater drain and is therefore considered a highly disturbed system.
- No surface water samples exceeded the 95% or 99% protection scenario for PFOA.
- The core PFAS compounds were not reported (i.e., below the laboratory LOR) at one location, SW4.

3.3 Quality Assurance/Quality Control Programme

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 D, and a summary is provided below.

- %RPDs for the PFAS compounds in the field duplicates ranged from 0 to 16% which is within the acceptable %RPD for duplicate samples.
- No PFAS compounds were detected above the laboratory LOR in the field blank samples, the trip blank samples or the equipment rinsate blanks.
- The results of the QA/QC assessment meet the data quality objectives for the sampling programme.

4.0 Discussion

4.1 Groundwater

In general, PFAS concentrations for the November 2023 monitoring round are within the historical ranges previously recorded at these locations. Time series plots showing a comparison of the sum of PFOS + PFHxS over time at select sampling locations are provided on Figure 3A.

4.1.1 On-base Monitoring Locations

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

- Concentrations of the core PFAS compounds at GW6 have decreased from the previous monitoring round and are all within their historic ranges. In the April 2023 monitoring round, the concentration of the Sum of Total PFOS and PFHxS was considerably higher than monitoring results reported since May 2018 and exceeded the drinking water standard, however the November 2023 result has decreased to a concentration below the drinking water standards. The reason for the spike in the April 2023 monitoring round is unknown.
- At MW6, concentrations of the core PFAS compounds have increased slightly from those observed during April 2023 but remain within historic ranges for this location.

- Concentrations of the Sum of Total PFOS and PFHxS are slightly higher at WS1 than previous rounds (being the highest recorded since sampling began at this location in 2018), but they are considered to be consistent with previous results, albeit slightly increasing. PFOA results have remained relatively consistent over this period.
- At MW9, concentrations of the core PFAS compounds have decreased from those observed during April 2023 and they remain within historic ranges for this location.
- At WS2 and MW4, concentrations of the core PFAS compounds remain within their historical ranges.
- This was the sixth monitoring round at GW111.1 and GW111.3 and the seventh round at GW111.2.
  - Concentrations of the core PFAS compounds have increased slightly in GW111.1 from those observed during April 2023 but remain within historic ranges for this location.
  - Minor detections of PFPeA and PFHxA were reported in GW111.2. This is the first time these compounds have been detected in GW111.2.
  - All PFAS compounds in GW111.3 were reported below the LOR, which is in agreement with the predicted groundwater conditions at this location. Two earlier monitoring rounds (October 2021 and March 2022) reported very low levels of the Sum of Total PFHxS + PFOS in GW111.3. The source of PFAS during these sampling events is unknown and these results are not in line with the model predictions. Additional sampling rounds (as prescribed by the LTMP) will continue to provide more information on PFAS concentrations at this location.

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, the Sum of Total PFOS and PFHxS was reported above the drinking water standard and is slightly higher than previous monitoring rounds , but they are considered to be consistent with previous results except September 2022 when all PFAS compounds were reported below the LOR. The result from the September 2022 monitoring round was unexpected but was likely a result of the landowner switching to the new Sanson reticulated water supply prior to sampling.
- This was the sixth monitoring round at GW112.1 and GW112.2.
  - In the shallow well GW112.1 (screened from 3.5 to 9.5 m bgl), the core PFAS compounds have slightly decreased from the previous monitoring round in April 2023 (Sum of Total PFOS + PFHxS of 0.51 µg/L). This remains in general agreement with, albeit lower than, the output from the PFAS groundwater model which predicted concentrations of the Sum of Total PFOS + PFHxS at this location and depth of ~0.8 µg/L to 1.4 µg/L.
  - PFAS compounds in GW112.2 were all reported below the LOR. This is consistent with the results from the April 2023 sampling round. And further confirms the theory that the anomalous sample results in March 2021 were likely the result of the inadvertent switching of samples GW112.1 and GW112.2 either in the field or in the laboratory.

Wells GW106, GW108 and 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.

- No PFAS compounds have been reported in any monitoring rounds to date at GW106 and GW109.

- A very low concentration of PFBA (just above the LOR) was detected at GW108 however, no other PFAS compounds were reported at GW108 during the November 2023 monitoring round. A very low PFBA concentration was also detected in the March 2021 and March 2022 monitoring rounds. The concentrations of PFBA detected at GW108 are only slightly above the LOR and PFBA has not been detected in the October 2020, the October 2021, the September 2022 and the April 2023 monitoring rounds. Consequently, it is not certain that these results are representative of the groundwater conditions at this location. The PFAS plume (as Sum of Total PFOS + PFHxS) is modelled to reach GW108 in the future and it is possible that the detection of PFBA is an indicator of the leading edge of the plume, or it may be from another source and/or laboratory or sampling related errors.

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

- At GW53, GW65 and GW107 no PFAS has been reported in any monitoring rounds to date.
- A minor concentration of PFBA was detected at GW67 however, no other PFAS compounds were reported at GW67 during the November 2023 monitoring round. Minor concentrations of PFOS were detected at GW67 in May 2018 and September 2018, however, there have been no detections of PFOS since that time.

A comparison of the sampling results to the PFAS groundwater model (PDP, 2019) developed for the area continues to show relatively good agreement. The November 2023 results agree with the model prediction for GW106 (no PFAS detected); GW112 (PFAS present in the shallow aquifer but not the deeper aquifers) and GW111, (PFAS present in the shallow aquifer but not the deeper aquifer). As noted in Section 4.1.1, very low concentrations of PFAS have been detected in GW111.3 during the previous monitoring rounds. These results are unexpected and given the remaining sampling results, may be the result of sampling or laboratory related errors. The data from the level loggers installed in the nested wells shows the deeper aquifer has a greater hydraulic head compared to the shallow aquifer which indicates there is an upward hydraulic gradient. This was an assumption of the PFAS groundwater model and would act to limit the migration of any PFAS compounds present in the shallow groundwater down into the deeper aquifer. It is important to note here however, that groundwater abstraction (e.g., for irrigation) could create localised areas of downward hydraulic gradient.

Additional sampling and groundwater level records as scheduled under the LTMP will help to determine actual groundwater conditions at GW112.

PFBA has historically been detected in GW108 in the March 2021 and March 2022 monitoring rounds and was also reported in the current monitoring round. It is possible that the low concentrations of PFBA detected during these monitoring rounds may be the beginning of the PFAS plume encroaching on this location as theorised by the model.

No obvious seasonal or rainfall induced patterns in PFAS concentrations at groundwater sampling locations are evident to date.

4.1.3 Transect

A comparison of select PFAS concentrations along a transect running northeast – southwest from the Base to GW106 has been undertaken. This direction generally follows the predicted shallow groundwater flow path[4]. Figure 4 shows the location of the transect A-A' and provides a plot showing the change in concentration of the sum of PFOS + PFHxS at select wells in the vicinity of this transect. The transect commences at GW67 which is immediately up hydraulic gradient from the Base, then passes through the

[4] It is important to keep in mind that the exact groundwater flow path is unknown and is likely to change seasonally depending on hydrologic conditions.

fire training area (MW4, cross and downgradient WS1), the shallow wells GW111.1 and GW112.1 before terminating at GW106. The last seven rounds of sampling are shown (note that there are only six rounds of data for GW67, GW106, GW111.1 and GW112.1). As expected, the plot shows the concentration of the sum of PFOS + PFHxS generally decreases with distance away from the Base.

4.2 Surface Water

A comparison of the concentration of total PFOS over time at select surface water sampling locations is provided on Figure 3B. Depending on the environment at the sample location, the ANZG for the protection of 95% or 99% of freshwater species is shown on the time series plots. Thus, at SW6 which is a stormwater drain, the 95% draft DGV is shown. At all other locations the 99% draft DGV is shown.

The concentrations of the core PFAS compounds in the sample collected from SW33 in November 2023 have increased relative to recent monitoring rounds (with the Sum of Total PFOS + PFHxS being at the highest recorded concentration since February 2018), but they remain within the historical ranges for this sample location.

The concentrations of the core PFAS compounds in the sample collected from SW36 in November 2023 have increased relative to recent monitoring rounds and are approaching the highest recorded concentrations for this location which were reported in March 2021. The March 2021 monitoring round is the first time these compounds were detected at this location.

The core PFAS compounds were detected below the laboratory LOR at SW4, the upgradient sample location, during the November 2023 monitoring round. Detections of the core PFAS compounds above the laboratory LOR have only been reported in two monitoring rounds, in March 2021 when the sample was collected from a stagnant pool and in April 2023 when the stream was flowing. The reason for these detections is unknown.

The concentrations of the core PFAS compounds in SW6 are higher than those reported in April 2023, but they remain within the historical ranges for this location.

The results from the November 2023 surface water sampling round are generally in agreement with those predicted by the PFAS groundwater model. No obvious seasonal or rainfall induced patterns in PFAS concentrations at surface water sample locations are evident to date.

5.0 Summary and Recommendations

Monitoring for per- and poly-fluoroalkyl substances (PFAS) in groundwater and surface water was conducted between 7 and 10 November 2023 in accordance with the RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (PDP, 2020a). Nineteen groundwater and four surface water samples were collected from locations on, and adjacent to the base. In summary:

- The results from the November 2023 monitoring round are generally consistent with the results from previous monitoring rounds.
- PFOS was detected above the applicable guideline values in all three downgradient surface water samples and concentrations of PFOS were higher than the previous monitoring round.
- PFAS has been detected at concentrations above the guideline values in eight groundwater samples collected in November 2023:
  - Two off-base groundwater samples (GW31 and GW112.1) exceed the NZ Drinking Water Standard (these wells are not currently being used for drinking water supply) and the ANZG ecological guideline value for the protection of freshwater species at the 99% level.

- Six on-base groundwater samples (WS1, MW4, GW6, MW6, MW9, and GW111.1) exceed the ANZG for the protection of freshwater species at the 99% level. Five of these samples (WS1, MW4, MW6, MW9, and GW111.1) also exceeded the NZ Drinking Water Standard (none of the wells are used for drinking water supply). Three of these samples (MW4, MW6, and MW9) also exceed the ANZG for the protection of freshwater species at the 95% level.

- Concentrations of the core PFAS compounds at GW6 have decreased from the previous monitoring round.
- Minor detections of PFPeA and PFHxA were reported in the November 2023 sample from GW111.2. This is the first time these compounds have been detected in this location and it is uncertain if these are representative of the groundwater conditions.

The data retrieved from the level loggers installed in the nested wells shows the deeper aquifer has a greater hydraulic head compared to the shallow aquifer indicating an upward hydraulic gradient. This was an assumption of the PFAS groundwater model and would act to limit downward migration of any PFAS compounds from the shallow groundwater into the deeper aquifer.

Samples from GW108 have historically reported PFBA during the March 2021 and March 2022 monitoring rounds. PFBA was also reported above the laboratory LOR during the current monitoring round. The model predicts movement of the plume towards GW108, and the detections may reflect seasonal variation in PFAS concentrations in the groundwater and the migration of the PFAS plume. However, it is not clear at this stage that these detections are representative of the shallow groundwater conditions.

The vertical heights of the nested monitoring wells (GW111.1, GW111.2, GW111.3, GW112.1 and GW112.2) were surveyed relative to a common datum during the November 2023 monitoring round.

No changes to the LTMP are recommended at this time.

6.0 References

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PDP, 2020a. *RNZAF Base Ohakea PFAS Investigation: Long Term Monitoring Plan (LTMP).* Pattle Delamore Partners (2020).

PDP, 2020b. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, October 2020.* Pattle Delamore Partners (2020).

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PDP, 2022b. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, March 2022.* Pattle Delamore Partners (2022).

PDP, 2023a. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, September 2022.* Pattle Delamore Partners (2023).

PDP, 2023b. *Ohakea: Surface Water and Groundwater Monitoring For PFAS, April 2023.* Pattle Delamore Partners (2023).

Water Services (Drinking Water Standards for New Zealand) Regulations 2022.

7.0 Limitations

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by New Zealand Defence Force, Horizons Regional Council and Cuttriss Consultants Limited. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of New Zealand Defence Force and Horizons Regional Council for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

This assessment is limited to collection and analysis of groundwater and surface water samples from discrete sampling locations. Interpretations of subsurface conditions, including contaminant concentrations, are not guaranteed at distance away from the specific points of sampling.

This document has been prepared based on the November 2023 sampling and analysis round and the results from laboratory analysis. The site conditions as described in this document have been interpreted from, and are subject to, this information and its limitations and accordingly PDP does not represent that its interpretation accurately represents the full site conditions.

The laboratory test results provide an approximation of the concentration of the tested analytes and are subject to the inherent limitations of the laboratory techniques used for the tests.

Yours faithfully

PATTLE DELAMORE PARTNERS LIMITED

Prepared by

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Environmental Scientist

Reviewed by

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Approved by

Nerena Rhodes
Technical Director – Contaminated Land

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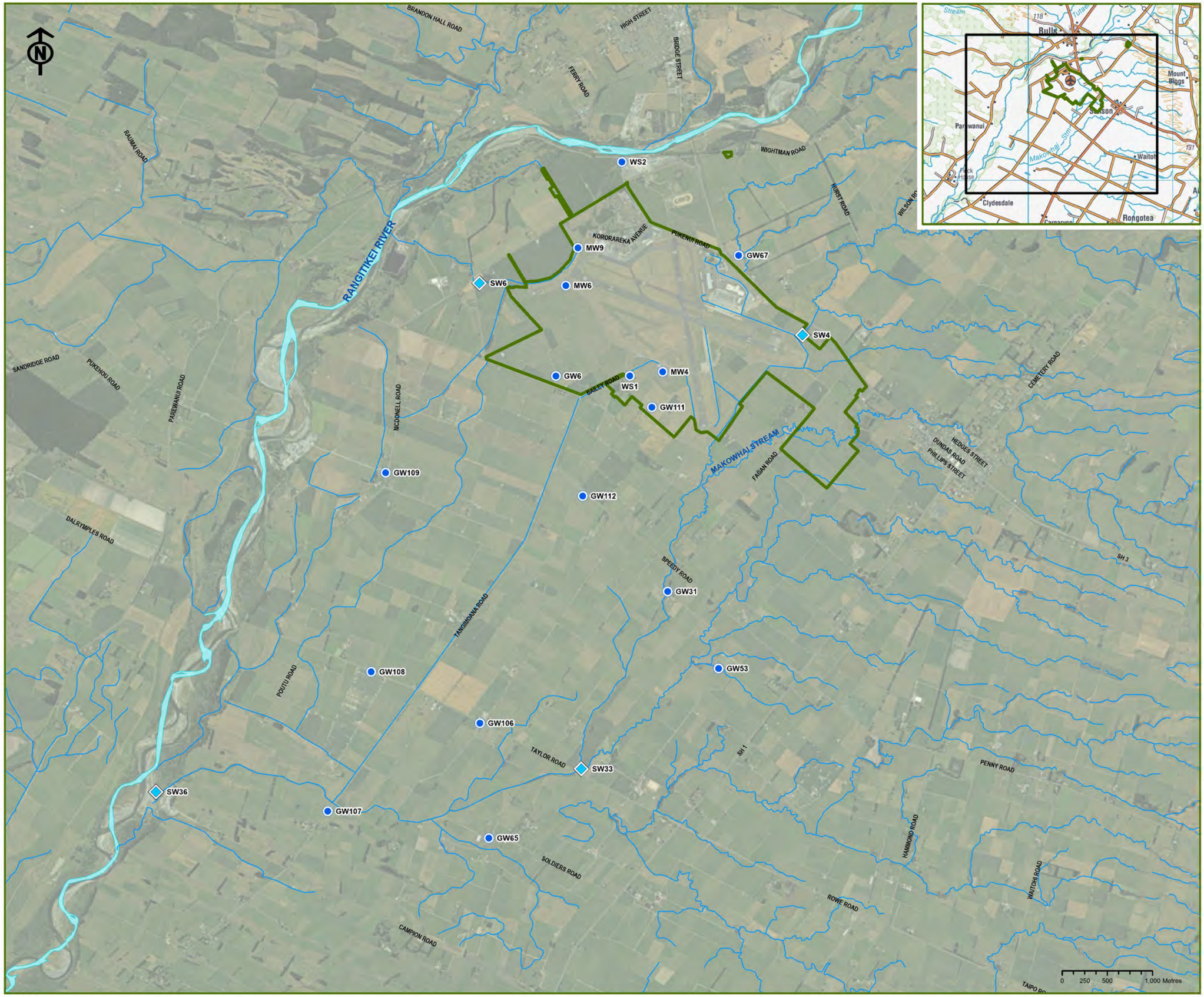
Scientist - Groundwater
Horizons Regional Council
PALMERSTON NORTH



TE OPE KĀTUA O AOTEAROA
DEFENCE FORCE

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KEY:

Sample Type:

- Groundwater
- Surface water
- RNZAF Base Ohakea Boundary
- River/Stream/Drain

SOURCE:
Aerial imagery (flown 2020-2021) sourced from the LINZ data service https://data.linz.govt.nz and licensed for re-use under the Creative Commons Attribution 4.0 International.
Cadastral and Topographic information supplied by LINZ.

NO	REVISION HISTORY	DATE
A	FINAL	JUN24
A	ISSUE 1	FEB24

pdp

PROJECT NAME:

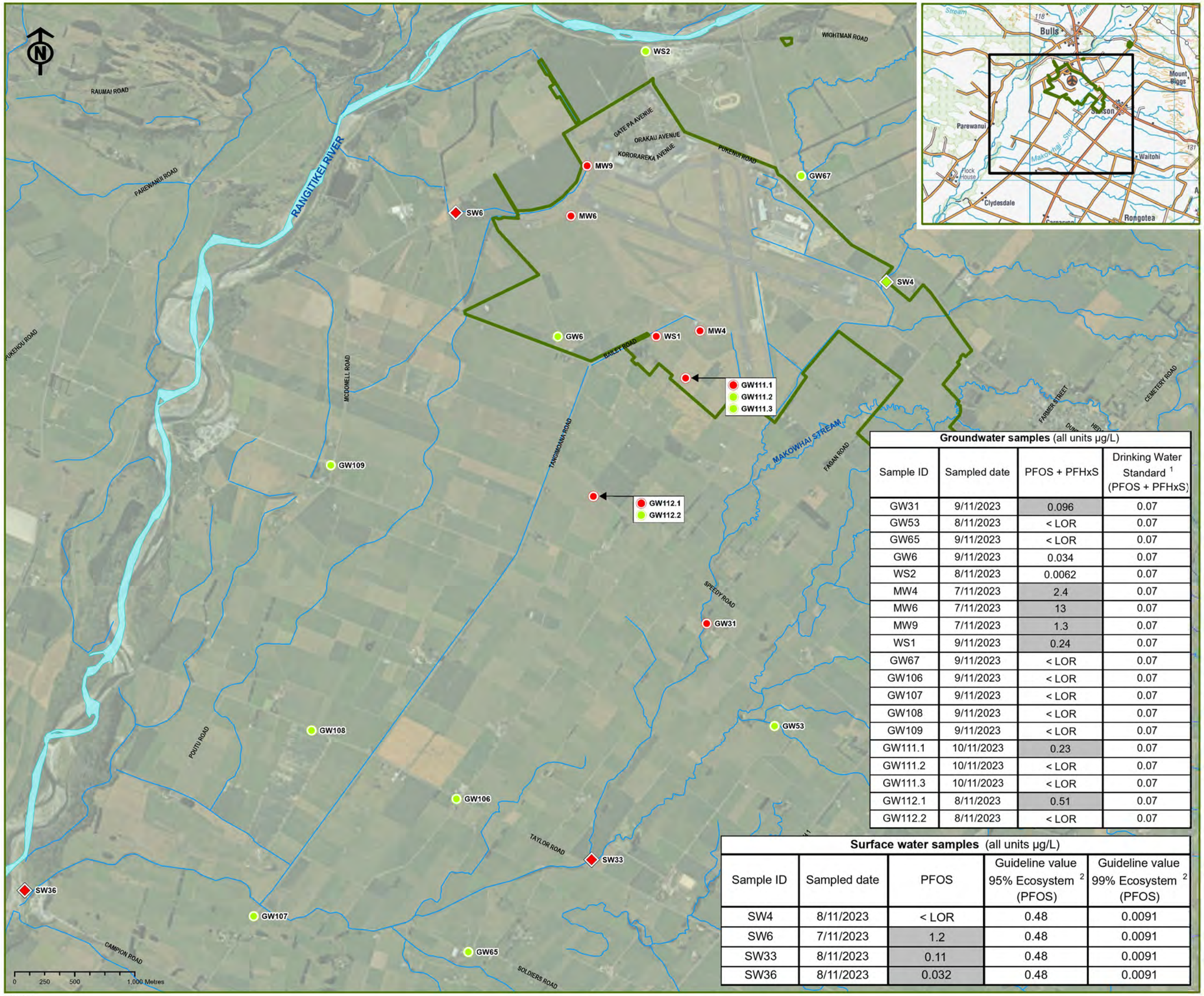
RNZAF BASE OHAKEA
PFAS INVESTIGATION:
LONG TERM
MONITORING PLAN

FIGURE TITLE:

SAMPLE LOCATION PLAN
NOVEMBER 2023

SCALE:	FIGURE NO.:	ISSUE NO.:
1:40,000 (A3)	1	A

A02744124



Groundwater samples (all units µg/L)

Sample ID	Sampled date	PFOS + PFHxS	Drinking Water Standard [1] (PFOS + PFHxS)
GW31	9/11/2023	0.096	0.07
GW53	8/11/2023	< LOR	0.07
GW65	9/11/2023	< LOR	0.07
GW6	9/11/2023	0.034	0.07
WS2	8/11/2023	0.0062	0.07
MW4	7/11/2023	2.4	0.07
MW6	7/11/2023	13	0.07
MW9	7/11/2023	1.3	0.07
WS1	9/11/2023	0.24	0.07
GW67	9/11/2023	< LOR	0.07
GW106	9/11/2023	< LOR	0.07
GW107	9/11/2023	< LOR	0.07
GW108	9/11/2023	< LOR	0.07
GW109	9/11/2023	< LOR	0.07
GW111.1	10/11/2023	0.23	0.07
GW111.2	10/11/2023	< LOR	0.07
GW111.3	10/11/2023	< LOR	0.07
GW112.1	8/11/2023	0.51	0.07
GW112.2	8/11/2023	< LOR	0.07

Surface water samples (all units µg/L)

Sample ID	Sampled date	PFOS	Guideline value 95% Ecosystem [2] (PFOS)	Guideline value 99% Ecosystem [2] (PFOS)
SW4	8/11/2023	< LOR	0.48	0.0091
SW6	7/11/2023	1.2	0.48	0.0091
SW33	8/11/2023	0.11	0.48	0.0091
SW36	8/11/2023	0.032	0.48	0.0091

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MAP KEY:

Above relevant guidelines:

- Groundwater
- Surface water

Below relevant guidelines:

- Groundwater
- Surface water
- RNZAF Base Ohakea Boundary
- River/Stream/Drain

TABLE KEY:

- <LOR — Below laboratory limit of reporting
- Concentration exceeds relevant Guideline/Standard

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

GUIDELINES USED:
1. Water Services (Drinking Water Standards for New Zealand) Regulations 2022.
2. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

SOURCE:
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Cadastral and Topographic information supplied by LINZ.

NO	REVISION HISTORY	DATE
A	FINAL	JUN24
A	ISSUE 1	FEB24

pdp

PROJECT NAME:

RNZAF BASE OHAKEA PFAS INVESTIGATION: LONG TERM MONITORING PLAN

FIGURE TITLE:

SAMPLE EXCEEDANCES NOVEMBER 2023

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

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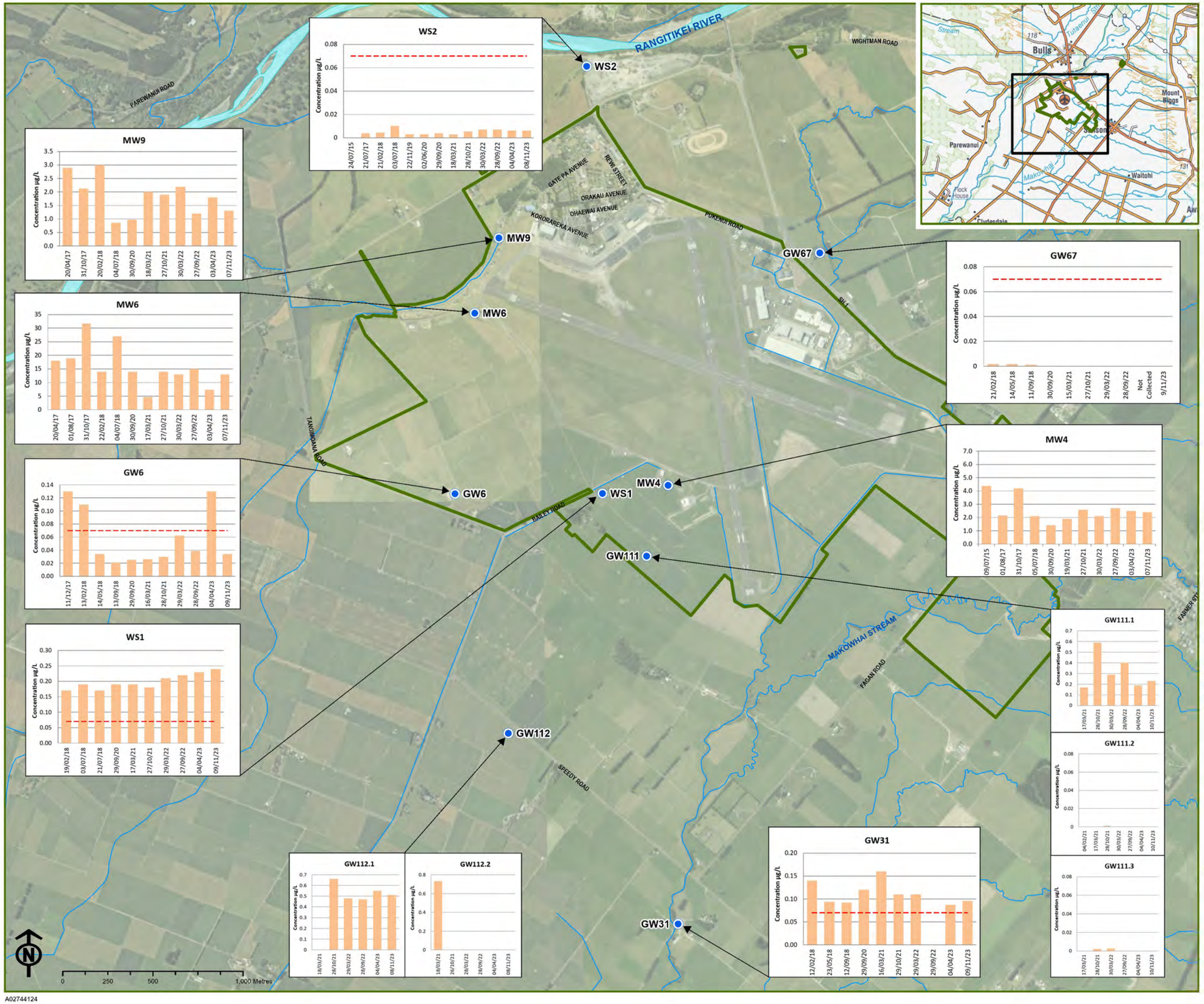

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MAP KEY:

Sample Type:

- Groundwater
- RNZAF Base Ohakea Boundary
- River/Stream/Drain

CHART KEY:

- Sum of PFOS+PFHxS (µg/L)
- NZ Drinking Water Standards (2022) for the sum of PFOS+PFHxS (µg/L)

NOTE:
1. Only sample locations where Sum of PFOS+PFHxS (µg/L) were above the Limit of Reporting (LOR) and with five or more sampling rounds have been shown.

2. The NZ Drinking Water Standard is only shown for sample locations that are currently, or were historically used as a potable supply.

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NO	REVISION HISTORY	DATE
A	FINAL	JUN24
A	ISSUE 1	FEB24

pdp

PROJECT NAME:

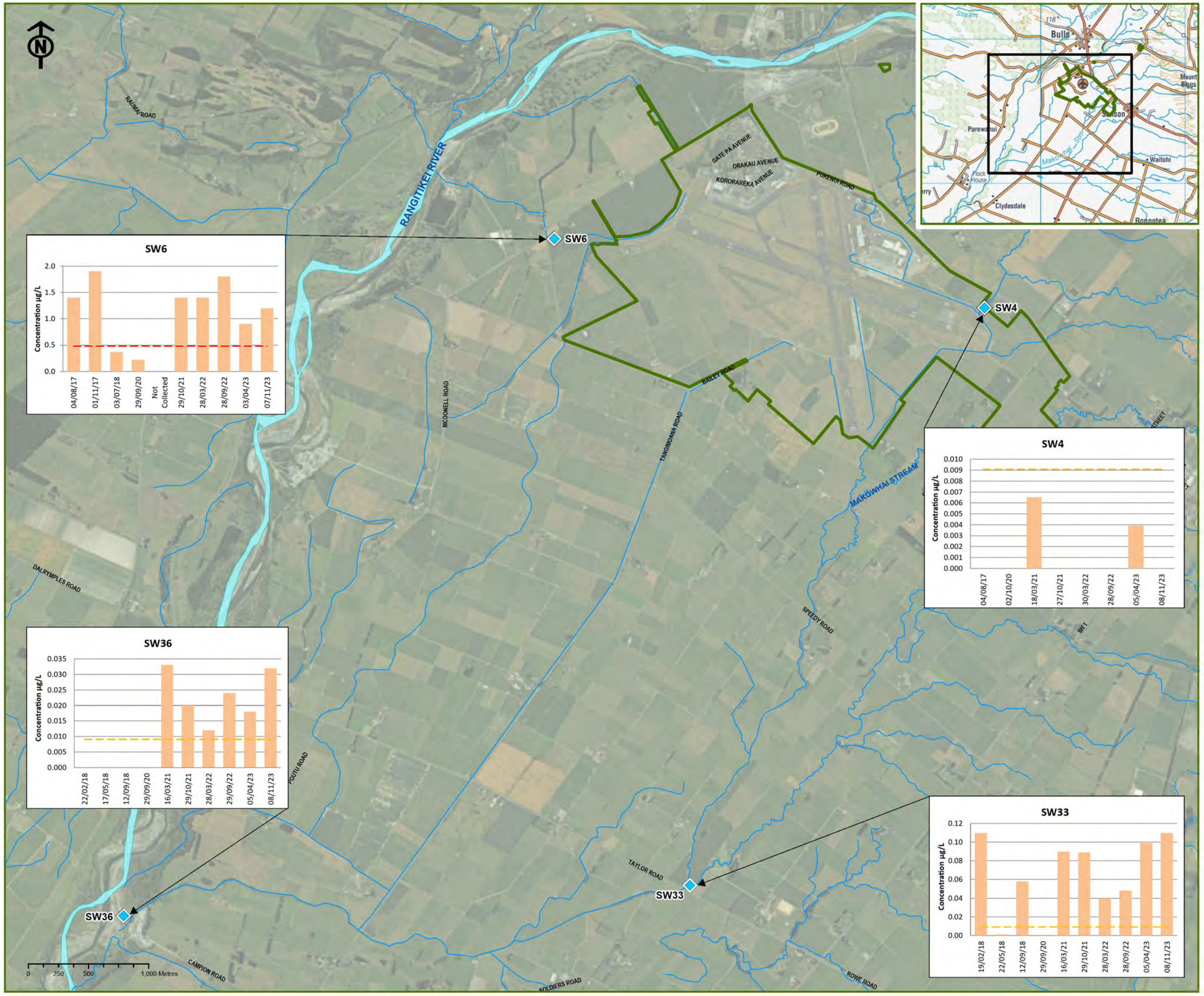
RNZAF BASE OHAKEA
PFAS INVESTIGATION:
LONG TERM
MONITORING PLAN

FIGURE TITLE:

GROUNDWATER CONCENTRATIONS OF PFOS+PFHxS OVER TIME FOR SELECT LOCATIONS NOVEMBER 2023

SCALE:	FIGURE NO.:	ISSUE NO.:
1:20,000 (A3)	3A	A

A02744124



TE OPE KĀTUA O AOTEAROA
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MAP KEY:

Sample Type:

- Surface water
- RNZAF Base Ohakea Boundary
- River/Stream/Drain

CHART KEY:

- PFOS (µg/L)
- ANZG 95% Draft default guideline value for total PFOS (µg/L)
- ANZG 99% Draft default guideline value for total PFOS (µg/L)

NOTE:
1. Only sample locations with five or more sampling rounds have been shown.

SOURCE:
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Cadastral and Topographic information supplied by LINZ.

NO	REVISION HISTORY	DATE
A	FINAL	JUN24
A	ISSUE 1	FEB24

pdp

PROJECT NAME:

RNZAF BASE OHAKEA PFAS INVESTIGATION: LONG TERM MONITORING PLAN

FIGURE TITLE:

SURFACE WATER CONCENTRATIONS OF PFOS OVER TIME FOR SELECT LOCATIONS NOVEMBER 2023

SCALE:	FIGURE NO.:	ISSUE NO.:
1:30,000 (A3)	3B	A

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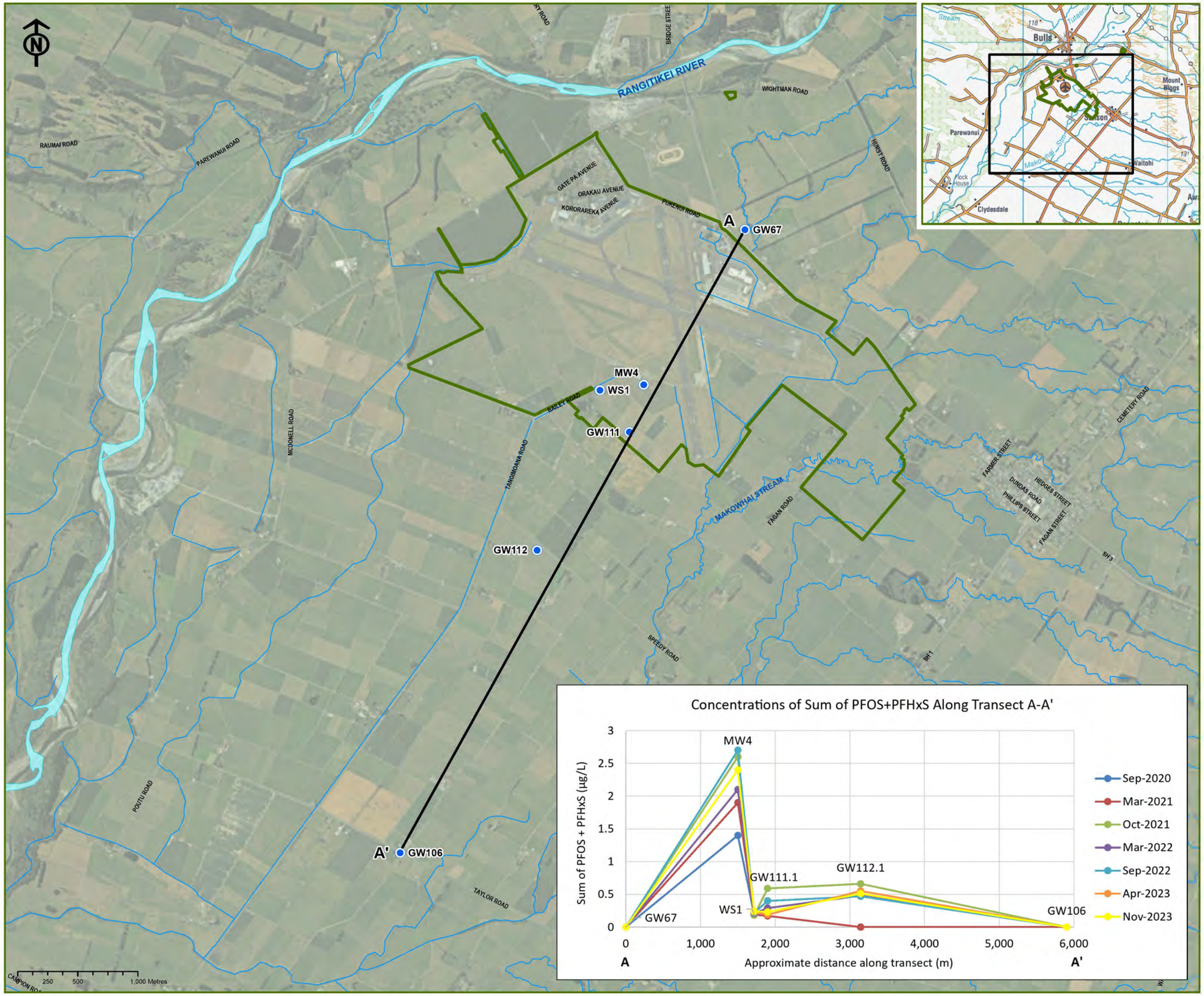

TE OPE KĀTUA O AOTEAROA
DEFENCE FORCE

horizons
REGIONAL COUNCIL

MAP KEY:

Sample Type:

- Groundwater
- RNZAF Base Ohakea Boundary
- River/Stream/Drain

SOURCE:
Aerial imagery (flown 2020-2021) sourced from the LINZ data service https://data.linz.govt.nz and licensed for re-use under the Creative Commons Attribution 4.0 International.
Cadastral and Topographic information supplied by LINZ.

NO	REVISION HISTORY	DATE
A	FINAL	JUN24
A	ISSUE 1	FEB24

pdp

PROJECT NAME:

RNZAF BASE OHAKEA PFAS INVESTIGATION: LONG TERM MONITORING PLAN

FIGURE TITLE:

GROUNDWATER TRANSECT LINE

SCALE:		FIGURE NO.:	ISSUE NO.:
1:30,000	(A3)	4	A

A02744124

Appendix A: Laboratory Results

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: A02744124
Final Report

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

PO Number: OHA_PFAS

Report Issued: 15-Nov-2023 **AsureQuality Reference: 23-298292** **Sample(s) Received:** 08-Nov-2023 08:25

Testing Period: 08-Nov-2023 to 14-Nov-2023
Date of analysis is available on request.

Sampled By: Bryn Taiapa

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_MW9_07 1123 **Lab ID:** 23-298292-1

Sample Condition: Acceptable **Sampled Date**: 07-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.036	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.034	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.077	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.50	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.58	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)	0.33	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.39	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.72	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	1.3	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	0.40	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	1.3	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.68	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.34	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.33	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.20	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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	1.2	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)
Internal Standards			
M3PFBS	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS	109	%	AsureQuality Method (LC-MS/MS)
M4PFBA	111	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	112	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	114	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA	97	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	95	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	104	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	107	%	AsureQuality Method (LC-MS/MS)
MPFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	111	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	106	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	98	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	93	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	107	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	93	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	91	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	91	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-298292-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	94	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	115	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	106	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	131	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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.

Christopher Sampson

Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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 Non Potable 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

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

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Certificate of Analysis

Submission Reference: A02744124
Final Report

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

PO Number: OHA_PFAS

Report Issued: 15-Nov-2023 **AsureQuality Reference: 23-298411** **Sample(s) Received:** 08-Nov-2023 08:25

Testing Period: 08-Nov-2023 to 14-Nov-2023
Date of analysis is available on request.

Sampled By: Bryn Taiapa

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_MW4_07 1123 **Lab ID:** 23-298411-1

Sample Condition: Acceptable **Sampled Date**: 07-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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	0.038	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.077	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.43	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.51	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)	0.58	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	1.3	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	1.9	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	2.4	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	0.78	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	0.26	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.17	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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	0.46	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	112	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS	101	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	108	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	105	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	96	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	105	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	103	%	AsureQuality Method (LC-MS/MS)
MPFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	107	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	91	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	88	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	96	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-298411-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	94	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	115	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	106	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	131	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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.

Christopher Sampson
Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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 Non Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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

PO Number: OHA_PFAS

Report Issued: 15-Nov-2023 **AsureQuality Reference: 23-298456** **Sample(s) Received:** 08-Nov-2023 08:25

Testing Period: 08-Nov-2023 to 14-Nov-2023
Date of analysis is available on request.

Sampled By: Bryn Taiapa

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SW6_07 1123 **Lab ID:** 23-298456-1

Sample Condition: Acceptable **Sampled Date**: 07-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.069	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.077	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.16	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.92	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	1.1	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.041	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.027	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.50	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.69	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	1.2	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	2.3	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	0.24	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.78	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.57	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.28	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.34	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.14	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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	0.35	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	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA	111	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	115	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	113	%	AsureQuality Method (LC-MS/MS)
MPFHpA	106	%	AsureQuality Method (LC-MS/MS)
M8PFOA	100	%	AsureQuality Method (LC-MS/MS)
M9PFNA	103	%	AsureQuality Method (LC-MS/MS)
M6PFDA	111	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	99	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	111	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	116	%	AsureQuality Method (LC-MS/MS)
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	112	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	94	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	90	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	121	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-298456-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	94	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	115	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	106	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	131	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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.

Christopher Sampson
Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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 Non Potable 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

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

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Certificate of Analysis

Submission Reference: A02744124
Final Report

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

PO Number: OHA_PFAS

Report Issued: 15-Nov-2023 **AsureQuality Reference: 23-298487** **Sample(s) Received:** 08-Nov-2023 08:25

Testing Period: 08-Nov-2023 to 14-Nov-2023
Date of analysis is available on request.

Sampled By: Bryn Taiapa

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_MW6_07 1123 **Lab ID:** 23-298487-1

Sample Condition: Acceptable **Sampled Date**: 07-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	0.065	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.25	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.30	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.69	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	4.6	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	5.3	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.17	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.12	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	2.6	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	4.8	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	7.5	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	13	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	0.53	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	1.6	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	1.4	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.63	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.84	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.50	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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	0.28	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	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	115	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	116	%	AsureQuality Method (LC-MS/MS)
MPFHpA	116	%	AsureQuality Method (LC-MS/MS)
M8PFOA	99	%	AsureQuality Method (LC-MS/MS)
M9PFNA	101	%	AsureQuality Method (LC-MS/MS)
M6PFDA	108	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	101	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	113	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	132	%	AsureQuality Method (LC-MS/MS)
MPFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	111	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	98	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	90	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	86	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	145	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-298487-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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	104	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	94	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	115	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	106	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	131	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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.

Christopher Sampson
Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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 Non Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 16-Nov-2023 **AsureQuality Reference: 23-299454** **Sample(s) Received:** 09-Nov-2023 08:20

Testing Period: 09-Nov-2023 to 16-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SW36_081123 **Lab ID:** 23-299454-1

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.0045	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.025	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.030	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0011	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.015	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.016	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.032	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.062	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0050	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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.046	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.032	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.014	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0088	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0032	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	NR	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	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	NR	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	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)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010 (P)	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	134	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	155 (R)	%	AsureQuality Method (LC-MS/MS)
M8PFOS	194 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	98	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	115	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	120	%	AsureQuality Method (LC-MS/MS)
MPFHpA	132	%	AsureQuality Method (LC-MS/MS)
M8PFOA	140	%	AsureQuality Method (LC-MS/MS)
M9PFNA	153 (R)	%	AsureQuality Method (LC-MS/MS)
M6PFDA	176 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	284 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	638 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	778 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	150	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	246 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	163 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	256 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	214 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	181 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	123	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	146	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	137	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	187 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	143	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-299454-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	95	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	77	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	87	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	102	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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

Christopher Sampson

Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR 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	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	NR µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	NR µg/L
NMeFOSAA	NR 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	NR µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744124
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 16-Nov-2023 **AsureQuality Reference: 23-299464** **Sample(s) Received:** 09-Nov-2023 08:20

Testing Period: 09-Nov-2023 to 16-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_WS2_081123 **Lab ID:** 23-299464-1

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)	0.0032	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.0032	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)	0.0013	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0017	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.0062	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0050	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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.0031	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0022	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0013	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0014	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	120	%	AsureQuality Method (LC-MS/MS)
M8PFOS	126	%	AsureQuality Method (LC-MS/MS)
M4PFBA	114	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	116	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	113	%	AsureQuality Method (LC-MS/MS)
M8PFOA	115	%	AsureQuality Method (LC-MS/MS)
M9PFNA	123	%	AsureQuality Method (LC-MS/MS)
M6PFDA	131	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	145	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	144	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	110	%	AsureQuality Method (LC-MS/MS)
MPFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	83	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	79	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	127	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	80	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	74	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	119	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	130	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	143	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-299464-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	95	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	77	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	87	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	102	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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

Christopher Sampson

Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR 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	0.0010 µg/L
P37DMOA	NR 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)	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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Pattle Delamore Partners Limited
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Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 16-Nov-2023 **AsureQuality Reference: 23-299467** **Sample(s) Received:** 09-Nov-2023 08:20

Testing Period: 09-Nov-2023 to 16-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SW33_081123 **Lab ID:** 23-299467-1

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0017	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0059	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)	0.010	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.056	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.066	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0022	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.040	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.066	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.11	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.18	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0050	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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.047	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.022	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0086	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	NR	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	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	NR	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	0.0024	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)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010 (P)	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	132	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	150	%	AsureQuality Method (LC-MS/MS)
M8PFOS	189 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	101	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	119	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	120	%	AsureQuality Method (LC-MS/MS)
MPFHpA	123	%	AsureQuality Method (LC-MS/MS)
M8PFOA	134	%	AsureQuality Method (LC-MS/MS)
M9PFNA	148	%	AsureQuality Method (LC-MS/MS)
M6PFDA	182 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	266 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	466 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	359 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	150	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	86	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	240 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	218 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	142	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	114	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	139	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	141	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	186 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	116	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-299467-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	95	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	77	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	87	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	102	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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

Christopher Sampson

Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR 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	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	NR µg/L
NMeFOSAA	NR 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	NR µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 16-Nov-2023 **AsureQuality Reference: 23-299471** **Sample(s) Received:** 09-Nov-2023 08:20

Testing Period: 09-Nov-2023 to 16-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW53_081123 **Lab ID:** 23-299471-1

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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)

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	NR	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	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)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010 (P)	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	142	%	AsureQuality Method (LC-MS/MS)
M8PFOS	182 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	112	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	112	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	112	%	AsureQuality Method (LC-MS/MS)
MPFHpA	116	%	AsureQuality Method (LC-MS/MS)
M8PFOA	119	%	AsureQuality Method (LC-MS/MS)
M9PFNA	142	%	AsureQuality Method (LC-MS/MS)
M6PFDA	168 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	224 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	357 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	290 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	132	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	150	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	133	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	151 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	160 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	150	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	110	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	121	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	160 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: Dupl.of 23-299471-1A **Lab ID:** 23-299471-2

Sample Description: 23220288_Duplicate

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	NR	µg/L	AsureQuality Method (LC-MS/MS)
Perfluorooctanesulfonamidoethanols			
NEtFOSE-M	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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)	NR	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	105	%	AsureQuality Method (LC-MS/MS)
M8PFOS	89	%	AsureQuality Method (LC-MS/MS)
M4PFBA	110	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	113	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	79	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	67	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	73	%	AsureQuality Method (LC-MS/MS)
MPFOSA	71	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	46	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	55	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	30	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	48	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	53	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	57	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	114	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	120	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-299471-1, 23-299471-2

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

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	<0.0050	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	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	95	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	77	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	87	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	102	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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

Christopher Sampson

Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR 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	NR 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	NR µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 16-Nov-2023 **AsureQuality Reference: 23-299472** **Sample(s) Received:** 09-Nov-2023 08:20

Testing Period: 09-Nov-2023 to 16-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW112.1_081123 **Lab ID:** 23-299472-1

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.028	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.043	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.23	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.27	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)	0.10	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.14	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.24	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.51	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	0.42	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.35	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.085	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.034	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	0.096	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	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	111	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	110	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	119	%	AsureQuality Method (LC-MS/MS)
MPFHpA	114	%	AsureQuality Method (LC-MS/MS)
M8PFOA	99	%	AsureQuality Method (LC-MS/MS)
M9PFNA	101	%	AsureQuality Method (LC-MS/MS)
M6PFDA	108	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	108	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	132	%	AsureQuality Method (LC-MS/MS)
MPFOSA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	113	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	96	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	94	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	90	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	104	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_GW112.2_081123 **Lab ID:** 23-299472-2

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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	NR	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	<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)	NR	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	117	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	127	%	AsureQuality Method (LC-MS/MS)
M8PFOS	135	%	AsureQuality Method (LC-MS/MS)
M4PFBA	112	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	112	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	109	%	AsureQuality Method (LC-MS/MS)
M8PFOA	115	%	AsureQuality Method (LC-MS/MS)
M9PFNA	129	%	AsureQuality Method (LC-MS/MS)
M6PFDA	127	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	112	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	93	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	90	%	AsureQuality Method (LC-MS/MS)
MPFOSA	87	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	35	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	56	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	49	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	55	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	107	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	116	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	136	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	112	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_GWKZR_081123 **Lab ID:** 23-299472-3

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.028	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.028	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)	0.046	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.23	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.28	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)	0.11	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.15	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.26	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.54	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	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.42	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.36	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.16	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.086	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.029	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	0.10	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	108	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	108	%	AsureQuality Method (LC-MS/MS)
M8PFOS	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA	110	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	112	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	113	%	AsureQuality Method (LC-MS/MS)
MPFHpA	115	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	114	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	109	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	110	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	137	%	AsureQuality Method (LC-MS/MS)
MPFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	110	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	101	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	95	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	95	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	90	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	87	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_GWKZS_081123 **Lab ID:** 23-299472-4

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA	110	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	105	%	AsureQuality Method (LC-MS/MS)
M9PFNA	109	%	AsureQuality Method (LC-MS/MS)
M6PFDA	103	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	128	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	132	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	64	%	AsureQuality Method (LC-MS/MS)
MPFOSA	104	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSA	61	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	71	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	109	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	121	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	61	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	74	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	115	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	114	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: OHA_GWKZT_081123 **Lab ID:** 23-299472-5

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)

Test	Result	Unit	Method Reference
Perfluorooctanesulfonamidoacetic acids			
NEtFOSAA	NR	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	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)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010 (P)	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	117	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	131	%	AsureQuality Method (LC-MS/MS)
M8PFOS	159 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	110	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	111	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	113	%	AsureQuality Method (LC-MS/MS)
MPFHpA	115	%	AsureQuality Method (LC-MS/MS)
M8PFOA	122	%	AsureQuality Method (LC-MS/MS)
M9PFNA	144	%	AsureQuality Method (LC-MS/MS)
M6PFDA	161 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	186 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	251 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	101	%	AsureQuality Method (LC-MS/MS)
MPFOSA	153 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	143	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	149	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	211 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	194 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	116	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	113	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	123	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	164 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	108	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: OHA_GWKZU_081123 **Lab ID:** 23-299472-6

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
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	97	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	94	%	AsureQuality Method (LC-MS/MS)
M8PFOS	87	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	100	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	100	%	AsureQuality Method (LC-MS/MS)
M6PFDA	105	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	130	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	140	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	88	%	AsureQuality Method (LC-MS/MS)
MPFOSA	103	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	89	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	90	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	115	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	128	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	73	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	89	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	114	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	116	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	116	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Duplicate of 23-299472-3A **Lab ID:** 23-299472-7

Sample Description: OHA_GWKZR_081123 Duplicate

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable Water - High Level			
Perfluoroalkylsulfonic acids			
PFPrS	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.027	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.025	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.044	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.24	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.28	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)	0.095	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.14	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.24	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Sum PFHxS+PFOS (1)	0.52	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	0.12	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.40	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.37	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.15	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.080	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.028	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	0.10	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	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS	108	%	AsureQuality Method (LC-MS/MS)
M4PFBA	110	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	115	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	113	%	AsureQuality Method (LC-MS/MS)
MPFHpA	112	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8PFOA	99	%	AsureQuality Method (LC-MS/MS)
M9PFNA	98	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	110	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	112	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	127	%	AsureQuality Method (LC-MS/MS)
MPFOSA	106	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	102	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	99	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	121	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-299472-1, 23-299472-3, 23-299472-7

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Non Potable 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)

Test	Result	Unit	Method Reference
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	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	104	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	105	%	AsureQuality Method (LC-MS/MS)
M6PFDA	106	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	94	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	108	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	115	%	AsureQuality Method (LC-MS/MS)
MPFOSA	101	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	100	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNMeFOSA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	96	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	107	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	106	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	131	%	AsureQuality Method (LC-MS/MS)

Blank

Relates to sample(s) 23-299472-2, 23-299472-4, 23-299472-5, 23-299472-6

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	95	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	77	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	87	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	102	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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 Non Potable Water - High Level			
DX-PFCS01, 05-HIGHLEVEL	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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

Christopher Sampson
Scientist

Accreditation

Appendix

Analyte LOR Summary

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

Analyte	LOR
Listing applies to samples: 23-299472-2, 23-299472-4, 23-299472-5, 23-299472-6	
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	NR 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	0.0010 µg/L
P37DMOA	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	NR µg/L
NMeFOSAA	0.0010 µg/L
Perfluorooctanesulfonamidoethanols	
NEtFOSE-M	NR 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)	NR 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 Non Potable Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	LOR
Listing applies to samples: 23-299472-1, 23-299472-3, 23-299472-7	
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 Potable Water - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Listing applies to samples: 23-299472-2, 23-299472-4, 23-299472-5, 23-299472-6	
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 Non Potable Water - High Level - AsureQuality Method (LC-MS/MS)

Analyte	Full Name
Listing applies to samples: 23-299472-1, 23-299472-3, 23-299472-7	
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

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

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Certificate of Analysis

Submission Reference: A02744124
Final Report

James Conway
Pattle Delamore Partners Limited
P O Box 9528
Auckland 1149
New Zealand

PO Number: OHA_PFAS

Report Issued: 16-Nov-2023 **AsureQuality Reference: 23-299473** **Sample(s) Received:** 09-Nov-2023 08:20

Testing Period: 09-Nov-2023 to 16-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_SW4__081123 **Lab ID:** 23-299473-1

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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)

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	NR	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	NR	µg/L	AsureQuality Method (LC-MS/MS)
NMeFOSAA	NR	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	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)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Miscellaneous			
F-53B (major)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	NR	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0010 (P)	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	132	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	151 (R)	%	AsureQuality Method (LC-MS/MS)
M8PFOS	191 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	93	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	116	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	116	%	AsureQuality Method (LC-MS/MS)
MPFHpA	124	%	AsureQuality Method (LC-MS/MS)
M8PFOA	134	%	AsureQuality Method (LC-MS/MS)
M9PFNA	153 (R)	%	AsureQuality Method (LC-MS/MS)
M6PFDA	167 (R)	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	268 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	463 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	658 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	126	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	143	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	109	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	224 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	201 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	127	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	102	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	149	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	133	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	182 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	138	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: OHA_GWKZV_081123 **Lab ID:** 23-299473-2

Sample Condition: Acceptable **Sampled Date**: 08-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	91	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	76	%	AsureQuality Method (LC-MS/MS)
M8PFOS	73	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	103	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	100	%	AsureQuality Method (LC-MS/MS)
MPFHpA	95	%	AsureQuality Method (LC-MS/MS)
M8PFOA	88	%	AsureQuality Method (LC-MS/MS)
M9PFNA	87	%	AsureQuality Method (LC-MS/MS)
M6PFDA	91	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	104	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	155 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	91	%	AsureQuality Method (LC-MS/MS)
MPFOSA	129	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	139	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	144	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	118	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	121	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	127	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	116	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	107	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-299473-1, 23-299473-2

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

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	<0.0050	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	NR	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	<0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	NR	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	96	%	AsureQuality Method (LC-MS/MS)
M8PFOS	95	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	109	%	AsureQuality Method (LC-MS/MS)
MPFHpA	100	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	95	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	77	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	87	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	102	%	AsureQuality Method (LC-MS/MS)
MPFOSA	98	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	84	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	88	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	104	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	100	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	113	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
DX-PFCS01, 03-SUITE_B	AsureQuality Method (LC-MS/MS)	IANZ	Christopher Sampson

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

Christopher Sampson

Scientist

Accreditation

Appendix

Analyte LOR Summary

Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	NR 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	NR µg/L
Perfluorooctanesulfonamides	
PFOSA	0.0010 µg/L
NEtFOSA-M	0.0010 µg/L
NMeFOSA-M	0.0010 µg/L
Perfluorooctanesulfonamidoacetic acids	
NEtFOSAA	NR µg/L
NMeFOSAA	NR 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	NR µg/L
Telomere Carboxylic acids	
FPrPA (3:3FTA)	0.0010 µg/L
FPePA (5:3FTA)	0.0010 µg/L

FHpPA (7:3FTA)	NR µg/L
Miscellaneous	
F-53B (major)	0.0010 µg/L
F-53B (minor)	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744124
Amended Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-300823** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 10-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Comments

Amended Report: Sampled Date amended.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW6_091123 **Lab ID:** 23-300823-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0026	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0034	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.0032	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.017	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.020	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)	0.0075	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0069	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.014	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.034	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0063	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.0050	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0055	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.0033	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.0027	µg/L	AsureQuality Method (LC-MS/MS)

Report Number 3521816 cancels Report Number 3521586.

Test	Result	Unit	Method Reference
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	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	121	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	130	%	AsureQuality Method (LC-MS/MS)
M8PFOS	173 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	47	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	65	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	64	%	AsureQuality Method (LC-MS/MS)
MPFHpA	70	%	AsureQuality Method (LC-MS/MS)
M8PFOA	95	%	AsureQuality Method (LC-MS/MS)
M9PFNA	101	%	AsureQuality Method (LC-MS/MS)
M6PFDA	108	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	148	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	191 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	688 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	62	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	114	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	74	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	125	%	AsureQuality Method (LC-MS/MS)

Report Number 3521816 cancels Report Number 3521586.

Test	Result	Unit	Method Reference
DNMeFOSAA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	78	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	72	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	132	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	152 (R)	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	199 (R)	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	65	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-300823-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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 3521816 cancels Report Number 3521586.

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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	72	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	91	%	AsureQuality Method (LC-MS/MS)
M6PFDA	59	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	52	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	50	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	202 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	54	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	65	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	73	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	117	%	AsureQuality Method (LC-MS/MS)

Report Number 3521816 cancels Report Number 3521586.

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 Potable 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

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 Potable 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	NR 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

Report Number 3521816 cancels Report Number 3521586.

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 Potable 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 3521816 cancels Report Number 3521586.

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

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

Report Number 3521816 cancels Report Number 3521586.

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-300850** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 10-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW31_091123 **Lab ID:** 23-300850-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0031	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0088	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0065	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.014	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.050	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.064	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0020	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.022	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0078	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.032	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.096	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.040	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.077	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.029	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.013	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0026	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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	0.0032	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	113	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	95	%	AsureQuality Method (LC-MS/MS)
M8PFOS	96	%	AsureQuality Method (LC-MS/MS)
M4PFBA	106	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	94	%	AsureQuality Method (LC-MS/MS)
M8PFOA	95	%	AsureQuality Method (LC-MS/MS)
M9PFNA	97	%	AsureQuality Method (LC-MS/MS)
M6PFDA	88	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	95	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	93	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	68	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	55	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	70	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	78	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	94	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	85	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	90	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	106	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	93	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	92	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-300850-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	72	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	91	%	AsureQuality Method (LC-MS/MS)
M6PFDA	59	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	52	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	50	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	202 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	54	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	65	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	73	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	117	%	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 Potable 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

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 Potable 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	0.0010 µg/L
P37DMOA	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-300875** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 10-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW67_091123 **Lab ID:** 23-300875-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	123	%	AsureQuality Method (LC-MS/MS)
M8PFOS	163 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	53	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	86	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	91	%	AsureQuality Method (LC-MS/MS)
MPFHpA	97	%	AsureQuality Method (LC-MS/MS)
M8PFOA	112	%	AsureQuality Method (LC-MS/MS)
M9PFNA	120	%	AsureQuality Method (LC-MS/MS)
M6PFDA	119	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	136	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	160 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	70	%	AsureQuality Method (LC-MS/MS)
MPFOSA	84	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	50	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	69	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	132	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	122	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	61	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	64	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	128	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	112	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	124	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	84	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-300875-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	72	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	91	%	AsureQuality Method (LC-MS/MS)
M6PFDA	59	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	52	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	50	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	202 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	54	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	65	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	73	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	117	%	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 Potable 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

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 Potable 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	0.0010 µg/L
P37DMOA	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-300903** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 10-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW107_091123 **Lab ID:** 23-300903-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	95	%	AsureQuality Method (LC-MS/MS)
M8PFOS	101	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	96	%	AsureQuality Method (LC-MS/MS)
M8PFOA	96	%	AsureQuality Method (LC-MS/MS)
M9PFNA	102	%	AsureQuality Method (LC-MS/MS)
M6PFDA	102	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	108	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	94	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	46	%	AsureQuality Method (LC-MS/MS)
MPFOSA	93	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	77	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	76	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	106	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	73	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	92	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	114	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	89	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-300903-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	72	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	91	%	AsureQuality Method (LC-MS/MS)
M6PFDA	59	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	52	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	50	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	202 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	54	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	65	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	73	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	117	%	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 Potable 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

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 Potable 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	0.0010 µg/L
P37DMOA	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-300911** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 10-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW109--091123 **Lab ID:** 23-300911-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	74	%	AsureQuality Method (LC-MS/MS)
M8PFOS	69	%	AsureQuality Method (LC-MS/MS)
M4PFBA	104	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	92	%	AsureQuality Method (LC-MS/MS)
MPFHpA	88	%	AsureQuality Method (LC-MS/MS)
M8PFOA	84	%	AsureQuality Method (LC-MS/MS)
M9PFNA	81	%	AsureQuality Method (LC-MS/MS)
M6PFDA	68	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	58	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	38	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	26 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	67	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	46	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	56	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	35	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	57	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	93	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	89	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	79	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	75	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-300911-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	72	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	91	%	AsureQuality Method (LC-MS/MS)
M6PFDA	59	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	52	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	50	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	202 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	54	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	65	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	73	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	117	%	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 Potable 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

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 Potable 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	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-300940** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 10-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW108_091123 **Lab ID:** 23-300940-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.0015	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	114	%	AsureQuality Method (LC-MS/MS)
M8PFOS	161 (R)	%	AsureQuality Method (LC-MS/MS)
M4PFBA	88	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	97	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	107	%	AsureQuality Method (LC-MS/MS)
MPFHpA	95	%	AsureQuality Method (LC-MS/MS)
M8PFOA	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA	120	%	AsureQuality Method (LC-MS/MS)
M6PFDA	125	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	157 (R)	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	120	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	109	%	AsureQuality Method (LC-MS/MS)
MPFOSA	75	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	54	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	55	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	103	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	50	%	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	109	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	101	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-300940-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	72	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	91	%	AsureQuality Method (LC-MS/MS)
M6PFDA	59	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	52	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	50	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	202 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	54	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	65	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	73	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	117	%	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 Potable 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

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 Potable 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	0.0010 µg/L
P37DMOA	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744124
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-300950** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 10-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_WS1_091123 **Lab ID:** 23-300950-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.012	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.028	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.025	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.042	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.15	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.19	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0030	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0027	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.035	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.017	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.055	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.24	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.026	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.14	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.038	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.031	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0097	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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	0.0013	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.13	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	100	%	AsureQuality Method (LC-MS/MS)
M8PFOS	116	%	AsureQuality Method (LC-MS/MS)
M4PFBA	108	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	102	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA	96	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	107	%	AsureQuality Method (LC-MS/MS)
M6PFDA	100	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	126	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	107	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	53	%	AsureQuality Method (LC-MS/MS)
MPFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	58	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	63	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	112	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	104	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	75	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	78	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	76	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Dupl.of 23-300950-1A **Lab ID:** 23-300950-2

Sample Description: 23230346_Duplicate

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.012	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.027	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.026	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.037	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.14	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.18	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0026	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0026	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.027	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.015	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.045	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.22	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.025	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.13	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.11	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.036	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.029	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0081	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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	0.0013	µg/L	AsureQuality Method (LC-MS/MS)
6:2 FTS	0.12	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	122	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	115	%	AsureQuality Method (LC-MS/MS)
M8PFOS	143	%	AsureQuality Method (LC-MS/MS)
M4PFBA	108	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	107	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	103	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	125	%	AsureQuality Method (LC-MS/MS)
M6PFDA	126	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	144	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	131	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	62	%	AsureQuality Method (LC-MS/MS)
MPFOSA	105	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	76	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	97	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	124	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	123	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	66	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	84	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	102	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	119	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	109	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	92	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-300950-1, 23-300950-2

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	<0.0010	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)	<0.0010	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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0020	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
P37DMOA	NR	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)	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
F-53B (minor)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Sum F-53B	<0.0020	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	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	72	%	AsureQuality Method (LC-MS/MS)
M4PFBA	105	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	102	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	91	%	AsureQuality Method (LC-MS/MS)
M6PFDA	59	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	52	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	50	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	202 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	66	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	54	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	65	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	73	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	70	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	117	%	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 Potable 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

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 Potable 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	0.0010 µg/L
P37DMOA	NR 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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-300966** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 10-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW106_091123 **Lab ID:** 23-300966-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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	<0.0020	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	<0.0010	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	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	122	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	122	%	AsureQuality Method (LC-MS/MS)
M8PFOS	143	%	AsureQuality Method (LC-MS/MS)
M4PFBA	101	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	108	%	AsureQuality Method (LC-MS/MS)
MPFHpA	111	%	AsureQuality Method (LC-MS/MS)
M8PFOA	107	%	AsureQuality Method (LC-MS/MS)
M9PFNA	116	%	AsureQuality Method (LC-MS/MS)
M6PFDA	119	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	144	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	158 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	138	%	AsureQuality Method (LC-MS/MS)
MPFOSA	83	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	50	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	50	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	118	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	116	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	42	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	46	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	133	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	127	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

QC Results

Blank

Relates to sample(s) 23-300966-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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	<0.0020	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	<0.0010	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	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	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS	80	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	94	%	AsureQuality Method (LC-MS/MS)
M6PFDA	72	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	48	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	41	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	69	%	AsureQuality Method (LC-MS/MS)
MPFOSA	82	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	63	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	81	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	61	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	77	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	82	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	99	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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

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 Potable 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	0.0010 µg/L
PFTeDA	0.0010 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	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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744124
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-301008** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 14-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Sampled By: Bryn Taiapa

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW6a_091123 **Lab ID:** 23-301008-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0067	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.020	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.020	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.034	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.14	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.17	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0027	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0026	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.019	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.0082	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.030	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.20	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0020	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	0.094	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.076	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.032	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.023	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.0030	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0020	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	<0.0010	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	0.027	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	112	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	107	%	AsureQuality Method (LC-MS/MS)
M8PFOS	127	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	101	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	107	%	AsureQuality Method (LC-MS/MS)
M8PFOA	102	%	AsureQuality Method (LC-MS/MS)
M9PFNA	118	%	AsureQuality Method (LC-MS/MS)
M6PFDA	111	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	111	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	95	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	60	%	AsureQuality Method (LC-MS/MS)
MPFOSA	94	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	44	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	63	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	109	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	49	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	53	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	104	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	121	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	127	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-301008-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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	<0.0020	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	<0.0010	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	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	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS	80	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	94	%	AsureQuality Method (LC-MS/MS)
M6PFDA	72	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	48	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	41	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	69	%	AsureQuality Method (LC-MS/MS)
MPFOSA	82	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	63	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	81	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	61	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	77	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	82	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	99	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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

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 Potable 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	0.0010 µg/L
PFTeDA	0.0010 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	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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744125
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-301013** **Sample(s) Received:** 10-Nov-2023 08:30

Testing Period: 14-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Sampled By: Bryn Taiapa

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW65_091123 **Lab ID:** 23-301013-1

Sample Condition: Acceptable **Sampled Date**: 09-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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)

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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0020	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	<0.0010	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	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	111	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	109	%	AsureQuality Method (LC-MS/MS)
M8PFOS	116	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	106	%	AsureQuality Method (LC-MS/MS)
MPFHpA	105	%	AsureQuality Method (LC-MS/MS)
M8PFOA	101	%	AsureQuality Method (LC-MS/MS)
M9PFNA	111	%	AsureQuality Method (LC-MS/MS)
M6PFDA	99	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	89	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	72	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	66	%	AsureQuality Method (LC-MS/MS)
MPFOSA	87	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	46	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	69	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	85	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	48	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	57	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	108	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	92	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	107	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	111	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-301013-1

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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	<0.0020	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	<0.0010	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	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	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS	80	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	94	%	AsureQuality Method (LC-MS/MS)
M6PFDA	72	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	48	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	41	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	69	%	AsureQuality Method (LC-MS/MS)
MPFOSA	82	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	63	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	81	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	61	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	77	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	82	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	99	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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

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 Potable 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	0.0010 µg/L
PFTeDA	0.0010 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	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 Potable 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

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

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Certificate of Analysis

Submission Reference: A02744124
Final Report

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

PO Number: OHA_PFAS

Report Issued: 17-Nov-2023 **AsureQuality Reference: 23-302726** **Sample(s) Received:** 13-Nov-2023 08:30

Testing Period: 13-Nov-2023 to 17-Nov-2023
Date of analysis is available on request.

Sampled By: Myra Belko

Results

The tests were performed on the samples as received.

Customer Sample Name: OHA_GW111.1_101123 **Lab ID:** 23-302726-1

Sample Condition: Acceptable **Sampled Date**: 10-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0017	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0068	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0062	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.014	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.078	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.092	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0043	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.059	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.081	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.14	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.23	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0020	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	0.082	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.28	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.19	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.099	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.069	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.015	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	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
PFTrDA	<0.0020	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	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	<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	0.0087	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	105	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	99	%	AsureQuality Method (LC-MS/MS)
M8PFOS	88	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	102	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	90	%	AsureQuality Method (LC-MS/MS)
M9PFNA	93	%	AsureQuality Method (LC-MS/MS)
M6PFDA	74	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	58	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	39	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	40	%	AsureQuality Method (LC-MS/MS)
MPFOSA	53	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	26 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	29 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	49	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	62	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
DNEtFOSE	23 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	31	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	86	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	116	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_GW111.2_101123 **Lab ID:** 23-302726-2

Sample Condition: Acceptable **Sampled Date**: 10-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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	0.0021	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.0012	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	<0.0020	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	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)

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	122	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	129	%	AsureQuality Method (LC-MS/MS)
M8PFOS	125	%	AsureQuality Method (LC-MS/MS)
M4PFBA	113	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	113	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	111	%	AsureQuality Method (LC-MS/MS)
MPFHpA	116	%	AsureQuality Method (LC-MS/MS)
M8PFOA	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA	119	%	AsureQuality Method (LC-MS/MS)
M6PFDA	112	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	86	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	59	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	199 (R)	%	AsureQuality Method (LC-MS/MS)
MPFOSA	45	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	20 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	23 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	56	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	79	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	21 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	19 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	119	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	120	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	129	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_GW111.3_101123 **Lab ID:** 23-302726-3

Sample Condition: Acceptable **Sampled Date**: 10-Nov-2023

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

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	<0.0020	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	<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	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)	NR	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
Sum F-53B	<0.0010 (P)	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	94	%	AsureQuality Method (LC-MS/MS)
M8PFOS	84	%	AsureQuality Method (LC-MS/MS)
M4PFBA	111	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	106	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	91	%	AsureQuality Method (LC-MS/MS)
M9PFNA	88	%	AsureQuality Method (LC-MS/MS)
M6PFDA	67	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	42	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	23 (R)	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	34	%	AsureQuality Method (LC-MS/MS)
MPFOSA	37	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	16 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	23 (R)	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	35	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	46	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	12 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	18 (R)	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	105	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	86	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	75	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	100	%	AsureQuality Method (LC-MS/MS)

P = Partial result - one or more individual components could not be reported

R = Recovery outside method limits

Customer Sample Name: OHA_GWKZW_101123 **Lab ID:** 23-302726-4

Sample Condition: Acceptable **Sampled Date**: 10-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable Water			
Perfluoroalkylsulfonic acids			
PFPrS	0.0018	µg/L	AsureQuality Method (LC-MS/MS)
PFBS	0.0067	µg/L	AsureQuality Method (LC-MS/MS)
PFPeS	0.0071	µg/L	AsureQuality Method (LC-MS/MS)
di-PFHxS (1)	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFHxS (1)	0.013	µg/L	AsureQuality Method (LC-MS/MS)
L-PFHxS (1)	0.077	µg/L	AsureQuality Method (LC-MS/MS)
Total PFHxS (3)	0.090	µg/L	AsureQuality Method (LC-MS/MS)
PFHpS	0.0020	µg/L	AsureQuality Method (LC-MS/MS)
di-PFOS (5)	0.0041	µg/L	AsureQuality Method (LC-MS/MS)
mono-PFOS (5)	0.064	µg/L	AsureQuality Method (LC-MS/MS)
L-PFOS (5)	0.090	µg/L	AsureQuality Method (LC-MS/MS)
Total PFOS (7)	0.16	µg/L	AsureQuality Method (LC-MS/MS)
Sum PFHxS+PFOS (1)	0.25	µg/L	AsureQuality Method (LC-MS/MS)
PFNS	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
PFDS	NR	µg/L	AsureQuality Method (LC-MS/MS)
PFECHS	<0.0010	µg/L	AsureQuality Method (LC-MS/MS)
Perfluoroalkylcarboxylic acids			
PFBA	0.080	µg/L	AsureQuality Method (LC-MS/MS)
PFPeA	0.28	µg/L	AsureQuality Method (LC-MS/MS)
PFHxA	0.18	µg/L	AsureQuality Method (LC-MS/MS)
PFHpA	0.098	µg/L	AsureQuality Method (LC-MS/MS)
PFOA	0.066	µg/L	AsureQuality Method (LC-MS/MS)
PFNA	0.015	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	<0.0020	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	<0.0010	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	NR	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	0.0090	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	121	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	126	%	AsureQuality Method (LC-MS/MS)
M8PFOS	128	%	AsureQuality Method (LC-MS/MS)
M4PFBA	115	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	112	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	112	%	AsureQuality Method (LC-MS/MS)
MPFHpA	113	%	AsureQuality Method (LC-MS/MS)
M8PFOA	108	%	AsureQuality Method (LC-MS/MS)
M9PFNA	119	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M6PFDA	114	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	86	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	69	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	57	%	AsureQuality Method (LC-MS/MS)
MPFOSA	62	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	39	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	39	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	74	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	90	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	23 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	37	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	111	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	107	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_GWKZX_101123 **Lab ID:** 23-302726-5

Sample Condition: Acceptable **Sampled Date**: 10-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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	<0.0020	µg/L	AsureQuality Method (LC-MS/MS)
PFTeDA	<0.0010	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	<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	<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	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	102	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	110	%	AsureQuality Method (LC-MS/MS)
M8PFOS	103	%	AsureQuality Method (LC-MS/MS)
M4PFBA	109	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	104	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	103	%	AsureQuality Method (LC-MS/MS)
MPFHpA	108	%	AsureQuality Method (LC-MS/MS)
M8PFOA	103	%	AsureQuality Method (LC-MS/MS)
M9PFNA	100	%	AsureQuality Method (LC-MS/MS)
M6PFDA	89	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	75	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	51	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	53	%	AsureQuality Method (LC-MS/MS)
MPFOSA	53	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	28 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	38	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	66	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	77	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	19 (R)	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	31	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	103	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	100	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	99	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M3HFPO-DA	105	%	AsureQuality Method (LC-MS/MS)

R = Recovery outside method limits

Customer Sample Name: OHA_GWKZY_101123 **Lab ID:** 23-302726-6

Sample Condition: Acceptable **Sampled Date**: 10-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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	<0.0020	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	<0.0010	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)

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	107	%	AsureQuality Method (LC-MS/MS)
M3PFHxS	114	%	AsureQuality Method (LC-MS/MS)
M8PFOS	123	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	105	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	101	%	AsureQuality Method (LC-MS/MS)
M8PFOA	101	%	AsureQuality Method (LC-MS/MS)
M9PFNA	118	%	AsureQuality Method (LC-MS/MS)
M6PFDA	115	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	104	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	88	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	37	%	AsureQuality Method (LC-MS/MS)
MPFOSA	83	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	36	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	44	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	113	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	108	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	30	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	41	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	101	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	114	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	131	%	AsureQuality Method (LC-MS/MS)

Customer Sample Name: Duplicate of 23-302726-6A **Lab ID:** 23-302726-7

Sample Description: OHA_GWKZY_101123 Duplicate

Sample Condition: Acceptable **Sampled Date**: 10-Nov-2023

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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)

Test	Result	Unit	Method Reference
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	<0.0020	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	<0.0020	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	<0.0010	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	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	113	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
M8PFOS	106	%	AsureQuality Method (LC-MS/MS)
M4PFBA	103	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	99	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	101	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	104	%	AsureQuality Method (LC-MS/MS)
M9PFNA	108	%	AsureQuality Method (LC-MS/MS)
M6PFDA	101	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	117	%	AsureQuality Method (LC-MS/MS)
MPFDoDA	117	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	111	%	AsureQuality Method (LC-MS/MS)
MPFOSA	79	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	62	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	97	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	100	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	51	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	54	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	97	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	96	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	110	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	116	%	AsureQuality Method (LC-MS/MS)

QC Results

Blank

Relates to sample(s) 23-302726-1, 23-302726-2, 23-302726-3, 23-302726-4, 23-302726-5, 23-302726-6, 23-302726-7

Test	Result	Unit	Method Reference
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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	<0.0020	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)

Test	Result	Unit	Method Reference
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	<0.0020	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	<0.0010	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	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	104	%	AsureQuality Method (LC-MS/MS)
M8PFOS	80	%	AsureQuality Method (LC-MS/MS)
M4PFBA	107	%	AsureQuality Method (LC-MS/MS)
M5PFPeA	109	%	AsureQuality Method (LC-MS/MS)
M5PFHxA	105	%	AsureQuality Method (LC-MS/MS)
MPFHpA	104	%	AsureQuality Method (LC-MS/MS)
M8PFOA	97	%	AsureQuality Method (LC-MS/MS)
M9PFNA	94	%	AsureQuality Method (LC-MS/MS)
M6PFDA	72	%	AsureQuality Method (LC-MS/MS)
M7PFUnDA	48	%	AsureQuality Method (LC-MS/MS)

Test	Result	Unit	Method Reference
MPFDoDA	41	%	AsureQuality Method (LC-MS/MS)
MPFTeDA	69	%	AsureQuality Method (LC-MS/MS)
MPFOSA	82	%	AsureQuality Method (LC-MS/MS)
DNEtFOSA	63	%	AsureQuality Method (LC-MS/MS)
DNMeFOSA	81	%	AsureQuality Method (LC-MS/MS)
DNEtFOSAA	57	%	AsureQuality Method (LC-MS/MS)
DNMeFOSAA	61	%	AsureQuality Method (LC-MS/MS)
DNEtFOSE	61	%	AsureQuality Method (LC-MS/MS)
DNMeFOSE	77	%	AsureQuality Method (LC-MS/MS)
M4:2FTS	98	%	AsureQuality Method (LC-MS/MS)
M6:2FTS	99	%	AsureQuality Method (LC-MS/MS)
M8:2FTS	82	%	AsureQuality Method (LC-MS/MS)
M3HFPO-DA	99	%	AsureQuality Method (LC-MS/MS)

Analysis Summary

Wellington Laboratory

Analysis	Method	Accreditation	Authorised by
Poly- and Perfluorinated Alkyl Substances (PFAS) in Potable 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

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 Potable 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	0.0010 µg/L
PFTeDA	0.0010 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	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	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 Potable 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

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

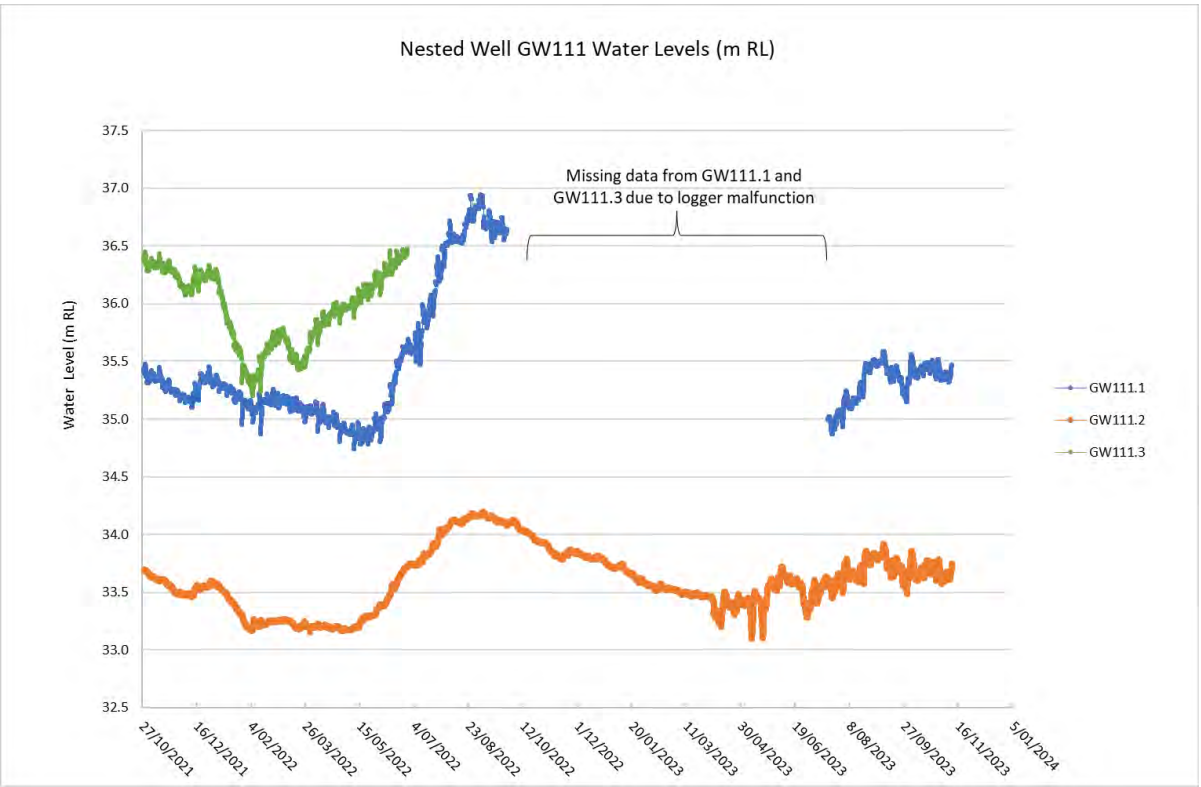
Appendix B: GW Level Measurements

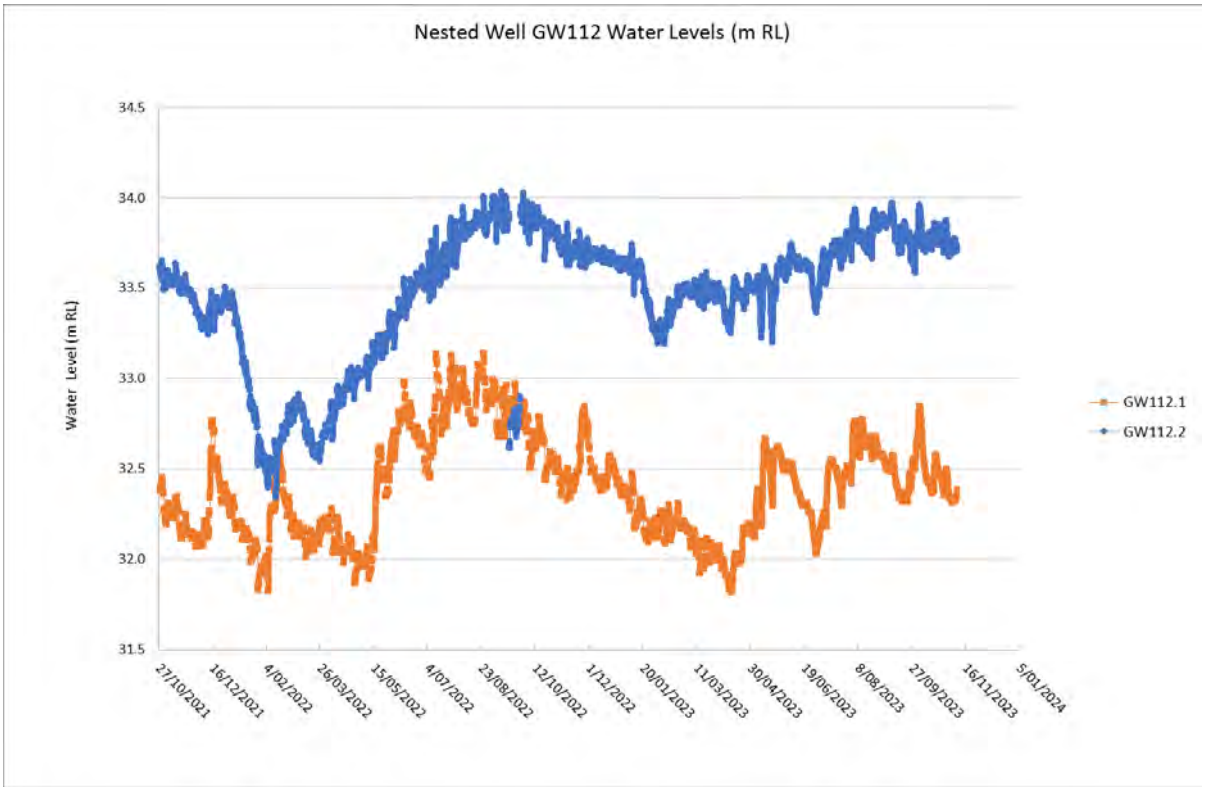
Table B-1: November 2023 Well Details and Water Level

Monitoring Well Ref	GW67	GW106	GW107	GW108	GW109	GW6	MW4	MW6	MW9
Total Depth of Well (m below TOC [1])	6.3	6.80	10.71	3.88	7.82	7.90	9.90	4.43	4.53
Diameter (mm)	116	50	50	50	50	1070	50	40	40
TOC [1] (m below ground level)	0	0.05	0.08	0.04	0.04	0.67 m agl [2]	0.07	0.03	0.05
Date	**9/11/2023**						**7/11/2023**		
Depth to Water (m below ground level)	2.40	2.18	2.91	1.38	4.36	3.79	5.97	3.35	1.54
Water depth (m below TOC)	2.40	2.13	2.83	1.34	4.315	4.46	5.90	3.32	1.49

Monitoring Well Ref	GW111.1	GW111.2	GW111.3	GW112.1	GW112.2
Total Depth of Well (m below TOC [1])	11.48	38.0	81.0	10.30	50.0
Diameter (mm)	50	50	50	50	50
TOC [1] (m below ground level)	0.426 m agl [2]	0.315 m agl [2]	0.286 m agl [2]	0.494 m agl [2]	1.011 m agl [2]
Date	**10/11/2023**			**8/11/2023**	
Depth to Water (m below ground level)	6.02	7.96	5.11	0.64	0.71 m agl 2
Water depth (m below TOC)	6.45	8.27	5.40	1.13	0.30

Notes:
1. TOC = top of casing.
2. agl = above ground level.


Nested Well GW111 Water Levels (m RL)
Water Level (m RL)
37.5
37.0
36.5
36.0
35.5
35.0
34.5
34.0
33.5
33.0
32.5
Missing data from GW111.1 and GW111.3 due to logger malfunction
GW111.1
GW111.2
GW111.3
27/10/2021
16/12/2021
4/02/2022
26/03/2022
15/05/2022
4/07/2022
23/08/2022
12/10/2022
1/12/2022
20/01/2023
11/03/2023
30/04/2023
19/06/2023
8/08/2023
27/09/2023
16/11/2023
5/01/2024


Nested Well GW112 Water Levels (m RL)
Water Level (m RL)
34.5
34.0
33.5
33.0
32.5
32.0
31.5
GW112.1
GW112.2
27/10/2021
16/12/2021
4/02/2022
26/03/2022
15/05/2022
4/07/2022
23/08/2022
12/10/2022
1/12/2022
20/01/2023
11/03/2023
30/04/2023
19/06/2023
8/08/2023
27/09/2023
16/11/2023
5/01/2024

Appendix C: Field Sheets

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

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: NZDF

Address: Access of Fager Road

Weather: Sunny

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) GWKZV Mighty Gripper

Job Number: ~~A02684802~~ A02744124

Sample Code (Name): SW4

Date and time: 08/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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)

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

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	—	—	—	13.2	7.3	814	93.4	6.52	—	7.98
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	NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes	☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA			

* = 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: Tangi Moana Road

Weather: Cloudy

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: SWLAA ~~SWA~~

Trip Blank: –

Field Blank: SWKZZ ~~SWB~~

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~~ A0274424

Sample Code (Name): SW6

Date and time: 07/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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	4.21	–	15.0	6.93	371.8	14.2	0.15	–	6.30
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

- No trip blank included with samples
- Lots of weed, low flow

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 NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes ☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA		

* = 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: Sunny

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~~ A02744125

Sample Code (Name): SW33

Date and time: 08/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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 None

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	—	—	—	17.0	7.88	590	-10.8	11.65	—	3.15
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 NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes ☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA		

* = 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: Champion Road Quarry

Weather: Sunny

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~~ A02744125

Sample Code (Name): SW36

Date and time: 08/11/23

Coordinates (NZTM): E

N

Sampled By: Myra (Clean hands)

Bryn (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 None

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	–	–	–	15.1	7.66	7.82	100.9	7.42	–	10.75
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: Collect from centre of 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 NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes ☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA		

* = 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: On-Base

Weather: Overcast

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: peristaltic 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~~ A027441 24

Sample Code (Name): MW4

Date and time: 07/11/23

Coordinates (NZTM): E

N

Sampled By: Bryn (Clean hands)

Myra (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 NA

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)	mV pH	EC ((µS/cm)	ORP (mV)	Dissolved Oxygen (mg/L)	Water Level (m)*	Turbidity (NTU) / Water Appearance†
Before	0	10:41	Cell	15.1	11.2	682	-19.8	1.16	5.91	6.03
During	5	10.46	0.7	14.7	12.1	674	-16.7	0.41	5.91	8.95
During	8	10.49	1.2	14.7	17.1	674	-14.9	0.33	5.91	8.80
During	13	10:54	1.8	14.7	14.6**	674	-22.7	0.27	5.91	13.40
During	19	11:00	2.4	14.6	13.5***	674	-24.6	0.23	5.91	14.17
During	22	11:03	3	14.6	14.8****	674	-24.1	0.22	5.91	14.15
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

11 x 30 + 250 = 580 ÷ 0.6

Comments

DTW: 5.90
DTB: 9.90
TOC: 0.07

Recorded ~~pH~~ mV by accident:
actual pH * 6.74
** 6.76
*** 6.74

Tubing in well. On airfield, between shed and abandoned plane. Climb over fence. Electric fence is on be aware!!! Well is situated within wooden fencing.

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	NA
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

~~Route Monitoring~~

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

Location: Ohakea / Woodbourne (circle as appropriate)

Land owner: NZDF

Address: On-base

Weather: Rain

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: peristaltic 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~~ A027744124

Sample Code (Name): MW6

Date and time: 07/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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 None

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

$4.46 \times 30 + 250 = 0.4L$

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	11:46	Cell	14.8	6.80	354.8	131.4	7.84	3.36	6.00
During	4	11.50	0.7	14.8	6.78	354	146.5	7.73	3.38	3.34
During	7	11.53	1.2	14.9	6.78	356.7	–	7.69	3.40	2.68
During	10	11.56	1.6	15.0	6.78	360.1	–	7.69	3.45	2.14
During	14	12:00	2.0	15.0	6.78	360.7	–	7.69	3.42	1.78
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

DTW: 3.32
DTB: 4.43
TOC: 0.03

Well located down hill within bunded area.
Slow recharge!!!

Analyses Required: PFAS suite

Serial number of water quality sensor unit: NA

Shake test – foam produced? ☐ Yes ☑ No Some air bubbles no foam

COC form completed and checked? ☑ Yes

Location field sheet completed? ☐ Yes ☑ N/A

Stabilisation criteria field sheet completed? ☑ Yes

Letter given to landowner? ☐ Yes NA

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: NZDF

Address: On-Base

Weather: Rain

Sample point: tap / (well) / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: peristaltic 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~~ A027444124

Sample Code (Name): MW9

Date and time: 07/11/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

MB (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 None

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

$30 \times 4.42 + 250 = 0.4$

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	14:03	Cell	14.2	6.39	462.2	-	2.28	1.57	63.5
During	4	14:07	0.4	14.6	6.37	469.7	-	0.66	1.63	110
During	8	14:11	0.8	14.6	6.37	448.8	-	0.39	1.65	64.5
During	11	14:14	1.3	14.5	6.38	447.8	-	0.34	1.7	42.2
During	14	14:17	1.8	14.5	6.40	452.7	-	0.32	1.71	20.33
During										
During										
During										
During										
During										
During										

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

Comments water cloudy

DTW 1.49
DTB 4.53
TOC 0.05

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

Drive to the sportsfield - Sign in at the office. Well is next to the pumpshed

Analyses Required: PFAS suite

Serial number of water quality sensor unit:

Shake test – foam produced?	☐ Yes	☑ No	Some air bubbles no foam		
COC form completed and checked?	☑ Yes		Letter given to landowner?	☐ Yes	NA
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: Tangimoana Road

Weather: Sunny

Sample point: tap / well / surface water (GW6)

Description of sample point: ('GW6A tap adjacent to dwelling / open well)

Distance of sample point from bore: — (m)

Sampling equipment: transfer bottle (GW6A) peristaltic pump (GW6)

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~~ ~~GW6~~ A02744124

Sample Code (Name): GW6

Date and time: 09/11/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

MB (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)

$6 \times 30 + 250 = 333 \approx 0.4$.

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

GW6A	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~~	—	—	—	16.3	7.61	578	137.9	9.22	—	1556?.47
~~During~~ Before GW6	0	13:15	Cell	14.3	7.19	608	-116.0	1.04	4.46	15.30
During	2	13:17	0.5	13.9	7.15	603	-121.0	0.58	4.46	14.44
During	3	13:18	1.0	13.8	7.15	603	-126	0.34	4.46	14.95
During	6	13.21	1.8	13.7	7.14	603	-128.3	0.27	4.46	16.05
During	9	13.24	2.6	13.7	7.14	603	-131.3	0.21	4.46	27.25
During	15	13.30	4.0	13.7	7.13	604	-135.2	0.16	4.46	15.97
During	18	13:33	5.0	13.7	7.13	604	-136.1	0.14	4.46	15.83
During	23	13:38	6.0	13.7	7.14	603	-139.0	0.12	4.46	15.19
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 : 4.46

DTB : 7.90 - Bring tubing + weights

- Lots of tubing in pfas container

- Water is blackish, with brakish smell

- Farmer told us that tap next to garage is ~~same~~ receiving water from same source as well. Sampled tap (GW6A) to confirm this.

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	N/A
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: Sunny

Sample point: tap / well / surface water

Description of sample point: Water tank behind milking shed

Distance of sample point from bore: (m)

Sampling equipment: transfer bottle

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): GW31

Date and time: 09/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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	—	—	—	15.6	6.71	660	-30.9	3.62	—	2688
During										
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	NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes	☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA			

* = 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: Sunny

Sample point: (tap) / well / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: Mighty

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~~ A0274425

Sample Code (Name): QW~~A~~T53

Date and time: 08/11/23

Coordinates (NZTM): E

N

Sampled By: MB (Clean hands)

RST (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 None

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	—	—	—	14.6	7.03	907	-52	3.60	—	421.55
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

Location field sheet completed? ☐ Yes ☑ N/A

Stabilisation criteria field sheet completed? ☑ Yes

Letter given to landowner? ☐ Yes N/A

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: Soldier Road

Weather: Overcast

Sample point: (tap) / well / surface water

Description of sample point: water tank

Distance of sample point from bore: — (m)

Sampling equipment: transfer bottle

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~~ A02744125

Sample Code (Name): GW65

Date and time: 09/11/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

MB (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 None

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	—	—	—	14.5	7.53	1266	-109	3.85	—	75562
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments

S&F Diaries

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 NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes ☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA		

* = 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: 3330 SH1

Weather: Overcast

Sample point: tap / well / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: peristaltic 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~~ A02744125

Sample Code (Name): GW67

Date and time: 09/11/23

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)

$4 \times 30 + 250 = 370 \approx 0.4$

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	11:09	Cell	14.8	6.82	1804	112.7	3.59	2.40	14.09
During	3	11:13	0.5	14.4	6.81	1808	122.2	0.71	2.40	15.66
During	5	11.15	1.0	14.4	6.81	1801	124.7	0.48	2.40	14.85
During	7	11.17	1.5	14.4	6.81	1808	126.2	0.40	2.40	15.09
During	9	11.19	2.0	14.4	6.81	1808	127.5	0.36	2.40	15.38
During	12	11.22	2.5	14.4	6.81	1808	128.3	0.33	2.40	13.31
During	15	11.25	3.0	14.4	6.81	1807	128.8	0.29	2.40	16.46
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: 2.40

DTB: 6.30

Diameter: 116 mm

- Well is to the right of the garage, along the fence

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 ☑ NA
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: Taylor Road

Address: ↓

Weather: Sunny

Sample point: tap / (well) / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: peristaltic 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~~ A0274412 5

Sample Code (Name): GW106

Date and time: 09/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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 None

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

~ 0.5L

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	9:31	Coll	15.1	6.59	941	39.2	2.91	2.14	13.41
During	2	9:33	0.5	14.6	6.53	942	75.3	0.74	2.14	12.30
During	5	9:36	1.0	14.5	6.54	943	92.3	0.43	2.14	10.82
During	8	9:38	1.5	14.5	6.54	942	103.7	0.38	2.14	14.97
During	10	9:40	2.0	14.5	6.54	941	107.3	0.29	2.14	12.79
During	12	9:42	2.5	14.4	6.55	941	114.7	0.23	2.14	12.80
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

DTW: 2.13

DTB: 6.80

- On grassed surface adjacent to 249 Taylor Road

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	NA
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: Taylor Road

Weather: Overcast

Sample point: tap / well / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: peristaltic 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~~ A0274425

Sample Code (Name): GW 108

Date and time: 09/11/23

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 None

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

1 ~ 0.5L

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	~~8:33~~	Cell	13.5	6.55	663	-3.0	3.19	1.40	115.09
During	2	8:35	0.5	13.3	6.55	677	-4.3	0.92	1.41	77.69
During	4	8:37	1.0	13.3	6.54	673	-2.7	0.54	1.42	68.5
During	6	8:39	1.5	13.3	6.54	673	-3.1	0.39	1.43	52.49
During	7	8:40	2.0	13.3	6.55	673	-4.0	0.34	1.44	46.93
During	8	8:41	2.5	13.3	6.55	670	-4.6	0.29	1.45	39.56
During	10	8:43	3.0	13.3	6.55	667	-4.8	0.26	1.45	34.65
During	12	8:45	3.5	13.4	6.56	662	-5.1	0.25	1.45	25.81
During	14	8:47	4.0	13.4	6.56	656	-4.0	0.27	1.45	23.69
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 1.34
DTB 3.88 - Good Recharge - Orangeish water
- Past the Yakka on the left hand side

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	N/A
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes	☐ N/A
Stabilisation criteria field sheet completed?	☑ Yes	4			

* = 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 Road

Weather: Overcast

Sample point: tap / well / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: peristaltic 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~~ A02744125

Sample Code (Name): GW107

Date and time: 09/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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 None

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

$6 \times 30 + 250 = 430 \sim 0.5$

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	0	7:35	Cell	14.8	7.08	207.8	93.2	2.40	2.83	8.66
During	2	7:37	0.5	14.7	6.68	145.6	91.9	0.94	2.83	8.50
During	4	7:39	1.0	14.8	6.75	210.8	41.5	0.64	2.83	8.44
During	5	7:40	1.5	14.8	6.96	440.2	-24.6	0.50	2.83	13.95
During	7	7:42	2.0	14.8	7.14	768	-69.8	0.39	2.83	19.44
During	9	7:44	2.5	14.8	7.18	821	-81.1	0.32	2.83	20.45
During	12	7:47	3.0	14.8	7.20	830	-86.2	0.27	2.83	22.18
During	13	7:48	3.5	14.7	7.21	834	-88.5	0.24	2.83	21.60
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 2.83
DTB 10.71

- Good Recharge

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	N/A
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: Sunny

Sample point: tap / (well) / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: peristaltic 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~~ A027744125

Sample Code (Name): GW109

Date and time: 09/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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 ~~Horse~~

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

~0.5

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	0	14:24	Cell	15.1	6.45	504	46.7	1.30	4.33	27.72
During	2	14:26	0.5	15.0	6.41	508	57.7	0.57	4.32	24.27
During	3	14:27	1.0	15.1	6.40	504	57.9	0.39	4.33	14.13
During	4	14:28	1.5	15.1	6.39	502	57.6	0.31	4.33	17.50
During	6	14:30	2.0	15.1	6.39	501	55.8	0.26	4.33	16.58
During	7	14:31	2.5	15.1	6.39	500	56.2	0.24	4.33	21.78
During	9	14:33	3.0	15.2	6.39	501	54.1	0.21	4.33	20.74
During	11	14:35	3.5	15.2	6.39	499.5	52.7	0.19	4.33	29.87
During	13	14:37	4.0	15.2	6.39	500	52.3	0.18	4.33	38.31
During										
During										

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

Comments

DTW 4.315

DTB: 7.82

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

- Adjacent to ZMR Aggregates sign
- Well is located just behind the farm gate

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: Bayley Road

Weather: Overcast

Sample point: tap / well / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: peristaltic pump

QA/QA Sample Codes:

Duplicate: GWKZW

Trip Blank: GWKZY

Field Blank: GWKZX

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~~ A0274124

Sample Code (Name): GW111.1

Date and time: 10/11/23

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 None

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

~ 0.6

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	10:01	Gal	14.6	6.60	398.2	82.7	3.57	6.45	5.79
During	4	10:05	0.6	14.8	6.45	375.5	128.4	1.69	6.45	8.46
During	6	10:07	1.2	14.8	6.46	375.8	141.3	1.55	6.45	8.10
During	8	10:10	1.8	14.7	6.45	373.6	154.8	1.47	6.45	8.61
During	9	10:11	2.4	14.8	6.43	371.0	159.8	1.44	6.45	8.63
During	12	10:14	3.0	15.2	6.43	372.6	163.7	1.41	6.45	8.79
During	14	10:16	3.6	15.3	6.42	372.5	168.8	1.36	6.45	9.09
During	18	10.20	4.2	15.0	6.42	372.1	177.8	1.35	6.44	4.18
During										
During										
During										

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

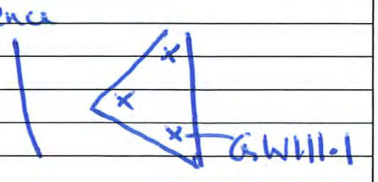
Sample Train Volume Calculation (L)
(length of sample tube x 3.141 x d^2 / 4000) + flow through cell volume.
Where d = internal diameter of sample tube in **mm**

Water sample internal ø = 6mm ≈ 30mL per meter

Comments

DTW 6.45

DTB 11.48



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: Bayley Road

Weather: Sunny

Sample point: tap / well / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: peristaltic 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~~ A0274424

Sample Code (Name): GW111.2

Date and time: 10/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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 None

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

~~1.4~~ 1.4L

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	9.30	Cell	13.7	6.68	1001	-26.1	0.62	8.27	16.59
During	5	9.35	~~5.5~~	13.6	6.49	983	-18.4	0.25	8.27	12.47
During	6	9:36	7	13.6	6.48	977	-13.5	0.19	8.27	11.33
During	8	9:38	8.5	13.6	6.44	970	-10.9	0.16	8.27	10.28
During	9	9:39	10	13.6	6.25	975	-6.5	0.16	8.27	10.50
During	12	9:42	11.5	13.6	6.91	966	-48.2	0.12	8.27	9.19
During	14	9:44	13	13.7	6.70	961	-43.5	0.11	8.27	11.41
During	16	9:46	14.5	13.6	6.73	956	-39.5	0.9	8.27	15.13
During	18	9:48	16.0	13.6	6.73	949	-35.5	0.09	8.27	15.25
During										
During										

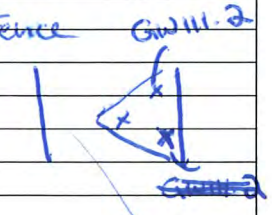
† CL=clear, CO=cloudy, TU=turbid, SI=silty, SA=sandy

Comments

DTW: 8.27
DTB: 38

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	NA
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: Bayley Road

Weather: Sunny

Sample point: tap / (well) / surface water

Description of sample point: –

Distance of sample point from bore: – (m)

Sampling equipment: Bladder 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~~ A0 2744124

Sample Code (Name): GWIII.3

Date and time: 10/10/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

MB (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 None

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

≈ 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	0	8:30	Coll	14.0	9.9	694	-380	1.71	5.40	11.43
During	10	8:40	2.5	13.9	7.96	959	-502	0.22	5.40	4.75
During	20	8:50	5	13.8	7.94	963	-495.2	0.14	5.40	1.92
During	28	8:58	7.5	13.6	7.93	969	-522.5	0.09	5.40	1.59
During	35	9:05	10	13.7	7.92	976	-554.4	0.08	5.40	1.84
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**

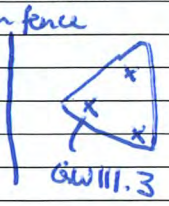
Water sample internal ø = 6mm ≈ 30mL per meter

Comments

DTW: 5.40

Do not measure DTB

DTB: 81.00



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 NA
Location field sheet completed?	☑ Yes	☑ N/A	Well field sheet completed?	☑ Yes ☐ N/A
Stabilisation criteria field sheet completed?	☑ Yes	NA		

* = 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: Sunny

Sample point: tap / well / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: peristaltic pump

QA/QA Sample Codes:

Duplicate: GWKZR ✓

Trip Blank: GWKZS ✓

Field Blank: GWKZT

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

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

Job Number: ~~A02684802~~ A0274125

Sample Code (Name): GW112.1

Date and time: 08/11/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

MB (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)

11 x 30 + 250 = 580 ~ 0.6

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	10.19	Cell	15.1	6.53	501	58.0	1.21	1.13	193.07
During	5	10.24	0.6	15.3	6.43	494.5	109.8	0.40	1.13	77.05
During	8	10.27	1.2	14.5	6.42	492.1	118.0	0.25	1.13	70.76
During	14	10.33	1.8	14.7	6.41	491.7	122.3	0.21	1.13	53.5
During	18	10.37	2.4	14.6	6.41	489.3	125.0	0.18	1.13	48.51
During	24	10.43	3.0	14.4	6.41	486.9	130.5	0.16	1.13	55.89
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

DTW: 1.13

DTB: 10.30 – Water is reddish

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 NA
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: partly sunny

Sample point: tap / well / surface water

Description of sample point: —

Distance of sample point from bore: — (m)

Sampling equipment: bladder 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~~ A0274425

Sample Code (Name): GW112

Date and time: 08/11/23

Coordinates (NZTM): E

N

Sampled By: BT (Clean hands)

MB (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)

= 2L

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	09:31	0	Coll	14.6	7.29	1238	-141.7	1.42	0.3	39.83
During	09.34	3	2	13.9	7.16	1178	-135.5	0.36	—	10.36
During	8	09.39	4	14.1	7.17	1138	-135.1	0.25	—	1.35
During	13	09.44	6	14.1	7.18	1133	-131.0	0.22	—	1.08
During	18	09.49	8	14.0	7.19	1131	-132.2	0.20	—	1.01
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

DTW = 0.3

- Remember to collect electric control unit + batteries

Drive: 10

Vent: 3

- Bring extra tubing
- Higher well is GW112.1
- Bring spans 8" - 200mm

- Download Logger

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	NA
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:

Weather: Sunny

Sample point: (tap) / well / surface water

Description of sample point: Pump shed

Distance of sample point from bore: — (m)

Sampling equipment: Transfer bottle

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~~ A0274424

Sample Code (Name): WS1

Date and time: 09/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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 None

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	—	—	—	15.8	7.37	561	-39.6	6.65	—	66660.05
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

- Open lever on pump & let it run for a couple of minutes

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 NA
Location field sheet completed?	☐ Yes	☑ N/A	Well field sheet completed?	☑ Yes ☐ N/A
Stabilisation criteria field sheet completed?	☐ Yes	NA		

* = 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: Quarry

Weather: Sunny

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~~ A027744124

Sample Code (Name): WSQ

Date and time: 08/11/23

Coordinates (NZTM): E

N

Sampled By: MB (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 None

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	—	11:35	—	14.9	7.0	667	-0.9	5.62	—	25801.7
During										
During										
During										
During										
During										
During										
During										
During										
During										
During										

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

Comments

- Open tap on hose
- Let hose running for a little bit
- Fill up bucket & then put in ProDSS
- Then fill up transfer bottle with hose

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	NA
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 D: QA/QC Results

Table D-1: QA/QC Water Sampling Results - Duplicates - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

Sample Location	GW112.1	GW112.1	**%RPD (GW112.1 and KZR)**	GW111.1	GW111.1	**%RPD (GW111.1 and KZW)**
Sample Name	OHA_GW112.1_081123	OHA_KZR_081123		OHA_GW111.1_101123	OHA_KZW_101123	
Laboratory Reference	3519873	3519873		3521624	3521624	
Monitoring Zone	Off base	Off base		On Base	On Base	
Sampled Date	8/11/2023	8/11/2023		10/11/2023	10/11/2023	
PFPrS	<0.025	<0.025	0	0.0017	0.0018	6
PFBS	0.027	0.028	4	0.0068	0.0067	1
PFPeS	0.028	0.028	0	0.0062	0.0071	14
di-PFHxS	<0.025	<0.025	0	<0.0010	<0.0010	0
Mono-PFHxS	0.043	0.046	7	0.014	0.013	7
L-PFHxS	0.23	0.23	0	0.078	0.077	1
Total PFHxS	0.27	0.28	4	0.092	0.090	2
PFHpS	<0.025	<0.025	0	0.0018	0.0020	11
di-PFOS	<0.025	<0.025	0	0.0043	0.0041	5
Mono-PFOS	0.10	0.11	10	0.059	0.064	8
L-PFOS	0.14	0.15	7	0.081	0.090	11
Total PFOS	0.24	0.26	8	0.14	0.16	13
Sum of PFHxS and PFOS	0.51	0.54	6	0.23	0.25	8
PFBA	0.11	0.12	9	0.082	0.080	2
PFPeA	0.42	0.42	0	0.28	0.28	0
PFHxA	0.35	0.36	3	0.19	0.18	5
PFHpA	0.15	0.16	6	0.099	0.098	1
PFOA	0.085	0.086	1	0.069	0.066	4
PFNA	0.034	0.029	16	0.015	0.015	0
PFDA	<0.025	<0.025	0	<0.0010	<0.0010	0
PFUnDA	<0.025	<0.025	0	<0.0010	<0.0010	0
PFTeDA	<0.10	<0.10	0	<0.0010	<0.0010	0
PFDoDA	<0.10	<0.10	0	<0.0010	<0.0010	0
FOSA	<0.025	<0.025	0	<0.0010	<0.0010	0
MeFOSA	<0.10	<0.10	0	-	<0.0010	-
MeFOSAA	<0.025	<0.025	0	<0.0010	<0.0010	0
EtFOSAA	<0.025	<0.025	0	<0.0010	<0.0010	0
4:2 FTS	<0.025	<0.025	0	<0.0010	<0.0010	0
6:2 FTS	0.096	0.10	4	0.0087	0.0090	3
8:2 FTS	<0.10	<0.10	0	<0.0010	<0.0010	0
10:2 FTS	<0.025	<0.025	0	-	-	-
FPrPA	<0.10	<0.10	0	<0.0010	<0.0010	0
EtFOSA	<0.10	<0.10	0	-	<0.0010	-
EtFOSE	<0.10	<0.10	0	-	-	-
FPePA	<0.025	<0.025	0	<0.0010	<0.0010	0
F-53B minor	<0.050	<0.050	0	<0.0010	<0.0010	0
HFPO-DA*	<0.050	<0.050	0	<0.0010	<0.0010	0
Sum F-53B	<0.10	<0.10	0	<0.0010	<0.0010	0
ADONA	<0.025	<0.025	0	<0.0010	<0.0010	0
P37DMOA	<0.050	<0.050	0	<0.0010	<0.0010	0
F-53B major	<0.10	<0.10	0	<0.0010	<0.0010	0

Notes:

1. Results in µg/L.

-	No value available
<0.001	Below the limit of reporting
%RPD	Relative Percent Difference

Table D-2: QA/QC Water Sampling Results - Blanks - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

Sample Location	Ohakea - on base			Ohakea - off base		
Sample Name	OHA_KZX_101123	OHA_KZV_081123	OHA_KZY_101123	OHA_KZT_081123	OHA_KZU_081123	OHA_KZS_081123
Lab Report Number	3521624	3519870	3521624	3519873	3519873	3519873
Sample Type	Field Blank	Rinsate	Trip Blank	Field Blank	Rinsate	Trip Blank
Sample Date	10/11/2023	8/11/2023	10/11/2023	8/11/2023	8/11/2023	8/11/2023
PFPrS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFBS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFPeS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
di-PFHxS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Mono-PFHxS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
L-PFHxS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total PFHxS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFHpS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
di-PFOS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Mono-PFOS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
L-PFOS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total PFOS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sum of PFHxS and PFOS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFECHS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFBA	<0.0010	-	<0.0010	-	-	-
PFPeA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFHxA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFHpA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFOA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFNA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFDA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFUnDA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFTrDA	<0.0020	<0.0050	<0.0020	-	<0.0050	<0.0050
PFTeDA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
PFDoDA	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010
FOSA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MeFOSA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MeFOSAA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
EtFOSAA	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010
4:2 FTS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
6:2 FTS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
8:2 FTS	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
10:2 FTS	-	<0.0010	-	-	<0.0010	<0.0010
FPrPA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
EtFOSA	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
EtFOSE	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
FPePA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
FHpPA	<0.0010	-	<0.0010	-	-	-
F-53B minor	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010
HFPO-DA*	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sum F-53B	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
ADONA	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
P37DMOA	<0.0010	-	<0.0010	-	-	-
F-53B major	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Notes:

1. Results in µg/L.

-	Not Reported
<0.001	Below the limit of reporting

Appendix E: Sample Results Tables

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

	PFAS in Groundwater							Guidelines		
Sample Name	MW4-1	MW4	MW4	MW4	OHA_FTA_MW4_5_300920	OHA_FTA_MW4_6_190321	OHA_FTA_MW4_7_271021			
Location	MW4	MW4	MW4	MW4	MW4	MW4	MW4			
Sample Date	9/07/2015	1/08/2017	31/10/2017	5/07/2018	30/09/2020	19/03/2021	27/10/2021	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	ES1526105	841470	937355	1186580	2132127	2314824	2590573			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results										
PFPrS	-	0.0072	0.011	0.011	<0.025	<0.025	<0.025	-	-	-
PFBS	0.05	0.032	0.043	0.034	0.025	0.034	0.033	-	-	-
PFPeS	-	0.022	0.065	0.051	0.029	0.046	0.048	-	-	-
di-PFHxS	-	<0.001	0.0017	0.0011	<0.025	<0.025	<0.025	-	-	-
Mono-PFHxS	-	0.1	0.14	0.081	0.061	0.083	0.091	-	-	-
L-PFHxS	-	0.54	0.76	0.49	0.35	0.46	0.6	-	-	-
Total PFHxS[4]	1.35	0.64	0.9	0.57	0.41	0.54	0.69	-	-	-
PFHpS	-	0.032	0.059	0.032	<0.025	<0.025	<0.025	-	-	-
di-PFOS	-	0.025	0.066	0.027	<0.025	0.029	0.032	-	-	-
Mono-PFOS	-	0.45	1.1	0.5	0.33	0.46	0.68	-	-	-
L-PFOS	-	1	2.1	1	0.69	0.91	1.2	-	-	-
Total PFOS[4]	**3.02**	**1.5**	**3.3**	**1.5**	**1**	**1.4**	**1.9**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	-	-	-	2.1	1.4	1.9	2.6	0.07	-	-
PFECHS	-	-	-	-	-	<0.025	<0.025	-	-	-
PFBA	-	0.21	0.29	0.2	0.17	0.17	0.27	-	-	-
PFPeA	-	1	1.7	1	0.65	0.79	1.1	-	-	-
PFHxA	2.09	0.99	0.96	0.74	0.41	0.51	0.73	-	-	-
PFHpA	0.71	0.34	0.43	0.32	0.22	0.26	0.37	-	-	-
PFOA	0.54	0.26	0.48	0.3	0.19	0.25	0.38	0.56	19	220
PFNA	0.32	0.16	0.35	0.18	0.1	0.13	0.24	-	-	-
PFDA	-	0.0021	0.0053	0.0048	<0.025	<0.025	<0.025	-	-	-
PFUnDA	<0.05	<0.005	0.003	-	<0.025	<0.025	<0.025	-	-	-
PFTrDA	<0.05	-	-	-	<0.1	<0.1	<0.1	-	-	-
PFTeDA	<0.5	-	-	-	<0.1	<0.1	<0.1	-	-	-
PFDoDA	<0.05	<0.005	<0.001	-	<0.1	<0.1	<0.1	-	-	-
FOSA	<0.02	<0.001	0.0032	0.004	<0.025	<0.025	<0.025	-	-	-
MeFOSA	<0.5	<0.005	<0.005	-	<0.1	<0.1	<0.1	-	-	-
MeFOSAA	-	<0.005	<0.005	-	<0.025	<0.025	<0.025	-	-	-
EtFOSAA	-	<0.005	<0.005	-	<0.025	<0.025	<0.025	-	-	-
4:2 FTS	-	<0.005	0.0054	0.0031	<0.025	<0.025	<0.025	-	-	-
6:2 FTS	5.6	0.88	1.6	0.86	0.45	0.45	1.1	-	-	-
8:2 FTS	<0.1	0.036	0.077	0.066	<0.1	<0.1	<0.1	-	-	-
10:2 FTS	-	-	-	-	-	<0.025	<0.025	-	-	-
FPrPA	-	-	-	-	-	<0.1	<0.1	-	-	-
EtFOSA	<0.05	<0.005	<0.005	-	<0.1	<0.1	<0.1	-	-	-
EtFOSE	<0.5	<0.005	<0.005	-	<0.1	<0.1	<0.1	-	-	-
FPePA	-	-	-	-	-	<0.025	<0.025	-	-	-
FHpPA	-	-	-	-	-	<0.025	<0.025	-	-	-
F-53B minor	-	-	-	-	-	<0.05	<0.05	-	-	-
HFPO-DA	-	-	-	-	-	<0.05	<0.05	-	-	-
Sum F-53B	-	-	-	-	-	<0.1	<0.1	-	-	-
ADONA	-	-	-	-	-	<0.025	<0.025	-	-	-
P37DMOA	-	-	-	-	-	<0.05	<0.05	-	-	-
F-53B major	-		-	-	-	<0.1	<0.1	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater							Guidelines		
Sample Name	OHA_FTA_MW4_8_300322	OHA_FTA_MW4_9_270922	OHA_MW4_030423	OHA_MW4_071123	MW6	MW6	MW6	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	MW4	MW4	MW4	MW4	MW6	MW6	MW6			
Sample Date	30/03/2022	27/09/2022	3/04/2023	7/11/2023	20/04/2017	1/08/2017	31/10/2017			
Lab Report Number	2788510	3008321	3276254	3518235	1327497	841470	937355			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results										
PFPrS	<0.025	<0.025	<0.025	<0.025	0.11	0.21	0.66	-	-	-
PFBS	0.035	0.032	0.032	0.025	0.56	0.76	1.8	-	-	-
PFPeS	0.046	0.045	0.036	0.038	0.81	0.81	2.3	-	-	-
di-PFHxS	<0.025	<0.025	<0.025	<0.025	0.014	0.02	0.052	-	-	-
Mono-PFHxS	0.098	0.11	0.077	0.077	1.1	1.9	4.1	-	-	-
L-PFHxS	0.6	0.62	0.54	0.43	5.3	8.1	22	-	-	-
Total PFHxS[4]	0.7	0.73	0.62	0.51	6.4	10	26	-	-	-
PFHpS	<0.025	<0.025	<0.025	<0.025	0.34	0.6	0.49	-	-	-
di-PFOS	0.026	0.026	0.03	<0.025	0.31	0.23	0.27	-	-	-
Mono-PFOS	0.49	0.72	0.59	0.58	4.9	2.8	2.4	-	-	-
L-PFOS	0.9	1.3	1.3	1.3	6.6	5.9	3	-	-	-
Total PFOS[4]	**1.4**	**2**	**1.9**	**1.9**	**12**	**8.9**	**5.7**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	2.1	2.7	2.5	2.4	18	-	-	0.07	-	-
PFECHS	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-
PFBA	0.21	0.24	0.17	0.20	1.1	1.1	1.3	-	-	-
PFPeA	0.87	0.95	0.66	0.78	3.6	4	6.8	-	-	-
PFHxA	0.6	0.61	0.44	0.51	2.8	4.4	7	-	-	-
PFHpA	0.33	0.36	0.24	0.26	0.9	1.5	2.5	-	-	-
PFOA	0.29	0.37	0.3	0.26	1.3	1.8	1.7	0.56	19	220
PFNA	0.17	0.23	0.17	0.17	0.75	0.86	0.37	-	-	-
PFDA	<0.025	<0.025	<0.025	<0.025	0.016	0.029	0.013	-	-	-
PFUnDA	<0.025	<0.025	<0.025	<0.025	-	0.0057	0.0043	-	-	-
PFTrDA	<0.1	<0.1	<0.1	<0.10	-	-	-	-	-	-
PFTeDA	<0.1	<0.1	<0.1	<0.10	-	-	-	-	-	-
PFDoDA	<0.1	<0.1	<0.1	<0.10	-	<0.005	<0.001	-	-	-
FOSA	<0.025	<0.025	<0.025	<0.025	0.0014	<0.001	<0.001	-	-	-
MeFOSA	<0.1	<0.1	<0.1	<0.10	-	<0.005	<0.005	-	-	-
MeFOSAA	<0.025	<0.025	<0.025	<0.025	-	<0.005	<0.005	-	-	-
EtFOSAA	<0.025	<0.025	<0.025	<0.025	-	<0.005	<0.005	-	-	-
4:2 FTS	<0.025	<0.025	<0.025	<0.025	<0.001	<0.005	<0.005	-	-	-
6:2 FTS	0.53	0.73	0.4	0.46	0.53	0.74	0.33	-	-	-
8:2 FTS	<0.1	<0.1	<0.1	<0.10	0.0089	0.0064	<0.005	-	-	-
10:2 FTS	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-
FPrPA	<0.1	<0.1	<0.1	<0.10	-	-	-	-	-	-
EtFOSA	<0.1	<0.1	<0.1	<0.10	-	<0.005	<0.005	-	-	-
EtFOSE	<0.1	<0.1	<0.1	<0.10	-	<0.005	<0.005	-	-	-
FPePA	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-
FHpPA	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-
F-53B minor	<0.05	<0.05	<0.05	<0.050	-	-	-	-	-	-
HFPO-DA	<0.05	<0.05	<0.05	<0.050	-	-	-	-	-	-
Sum F-53B	<0.1	<0.1	<0.1	<0.10	-	-	-	-	-	-
ADONA	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-
P37DMOA	<0.05	<0.05	<0.05	<0.050	-	-	-	-	-	-
F-53B major	<0.1	<0.1	<0.1	<0.10	-	-	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_MW6	MW6	OHA_RUP_MW6_6_300920	OHA_RUP_MW6_7_170321	OHA_RUP_MW6_8_271021	OHA_RUP_MW6_9_300322	OHA_RUP_MW6_10_270922	OHA_MW6_030423			
Location	MW6	MW6	MW6	MW6	MW6	MW6	MW6	MW6			
Sample Date	22/02/2018	4/07/2018	30/09/2020	17/03/2021	27/10/2021	30/03/2022	27/09/2022	3/04/2023	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	1055089	1186580	2132127	2314824	2590573	2788509	3008307	3276245			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.17	0.22	0.063	0.028	0.1	0.053	0.16	0.03	-	-	-
PFBS	0.43	0.72	0.22	0.11	0.33	0.19	0.46	0.11	-	-	-
PFPeS	0.66	0.77	0.26	0.12	0.38	0.24	0.64	0.12	-	-	-
di-PFHxS	0.025	0.015	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
Mono-PFHxS	1.8	1.7	0.62	0.25	0.77	0.57	1.3	0.28	-	-	-
L-PFHxS	4.1	11	4.2	1.6	5.7	3.8	7.7	2	-	-	-
Total PFHxS[4]	5.9	13	4.8	1.8	6.5	4.4	9	2.3	-	-	-
PFHpS	0.38	0.34	0.15	0.06	0.24	0.15	0.24	0.087	-	-	-
di-PFOS	0.39	0.27	0.13	0.075	0.18	0.15	0.17	0.097	-	-	-
Mono-PFOS	3.3	4.5	2.9	1.1	2.7	2.5	2.3	1.7	-	-	-
L-PFOS	4.5	9.7	6.5	1.7	4.6	5.5	3.4	3.3	-	-	-
Total PFOS[4]	**8.2**	**14**	**9.5**	**2.9**	**7.5**	**8.2**	**5.9**	**5.1**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	14	27	14	4.7	14	13	15	7.4	0.07	-	-
PFECHS	-	-	-	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
PFBA	0.66	1.2	1.4	0.35	0.57	0.57	0.61	0.37	-	-	-
PFPeA	2.5	4.1	3.2	1.1	1.7	2	2.2	1.1	-	-	-
PFHxA	2	4	2.2	0.78	1.6	1.4	2.2	0.78	-	-	-
PFHpA	0.93	1.9	1	0.37	0.69	0.63	0.9	0.39	-	-	-
PFOA	0.89	2.2	1.1	0.35	0.97	0.68	1	0.45	0.56	19	220
PFNA	0.66	1.3	0.75	0.28	0.61	0.55	0.49	0.41	-	-	-
PFDA	0.012	0.045	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
PFUnDA	<0.005	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
PFTrDA	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
PFTeDA	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
PFDoDA	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
FOSA	0.0085	<0.001	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
MeFOSA	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
MeFOSAA	<0.005	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
EtFOSAA	<0.005	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
4:2 FTS	<0.005	<0.001	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
6:2 FTS	1.7	0.46	0.23	0.84	<1	0.78	0.32	0.32	-	-	-
8:2 FTS	0.04	0.0069	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
10:2 FTS	-	-	-	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
FPrPA	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
EtFOSA	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
EtFOSE	<0.025	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
FPePA	-	-	-	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
FHpPA	-	-	-	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
F-53B minor	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
HFPO-DA	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
Sum F-53B	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-
ADONA	-	-	-	<0.025	<0.025	<0.025	<0.025	<0.025	-	-	-
P37DMOA	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-
F-53B major	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_MW6_071123	OHA_BAI_GW111.1_1_170321	OHA_BAI_GW111.1_2_281021	OHA_BAI_GW111.1_3_300322	OHA_BAI_GW111.1_4_280922	OHA_GW111.1_040423	OHA_GW111.1_101123	OHA_BAI_GW111.2_1_040221			
Location	MW6	GW111.1	GW111.1	GW111.1	GW111.1	GW111.1	GW111.1	GW111.2			
Sample Date	7/11/2023	17/03/2021	28/10/2021	30/03/2022	28/09/2022	4/04/2023	10/11/2023	4/02/2021	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	3518293	2390370	2593741	2787340	3021350	3288820	3521624	2256089			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.065	<0.025	<0.025	0.0023	0.0031	0.0019	0.0017	<0.001	-	-	-
PFBS	0.25	<0.025	<0.025	0.0083	0.011	0.0073	0.0068	<0.001	-	-	-
PFPeS	0.30	<0.025	<0.025	0.0083	0.014	0.0068	0.0062	<0.001	-	-	-
di-PFHxS	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
Mono-PFHxS	0.69	<0.025	0.032	0.012	0.03	0.012	0.014	<0.001	-	-	-
L-PFHxS	4.6	0.083	0.2	0.076	0.14	0.072	0.078	<0.001	-	-	-
Total PFHxS[4]	5.3	0.083	0.23	0.088	0.17	0.084	0.092	<0.001	-	-	-
PFHpS	0.17	<0.025	<0.025	0.0022	0.0045	0.0018	0.0018	<0.001	-	-	-
di-PFOS	0.12	<0.025	<0.025	0.0036	0.0061	0.0032	0.0043	<0.001	-	-	-
Mono-PFOS	2.6	0.035	0.15	0.061	0.087	0.043	0.059	<0.001	-	-	-
L-PFOS	4.8	0.05	0.21	0.14	0.14	0.063	0.081	<0.001	-	-	-
Total PFOS[4]	**7.5**	**0.085**	**0.36**	**0.2**	**0.23**	**0.11**	**0.14**	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	13	0.17	0.59	0.29	0.4	0.19	0.23	<0.001	0.07	-	-
PFECHS	<0.025	<0.025	<0.025	<0.001	<0.001	-	<0.0010	<0.001	-	-	-
PFBA	0.53	0.11	0.15	0.079	0.11	0.07	0.082	<0.001	-	-	-
PFPeA	1.6	0.39	0.86	0.26	0.53	0.24	0.28	<0.001	-	-	-
PFHxA	1.4	0.28	0.47	0.2	0.33	0.16	0.19	<0.001	-	-	-
PFHpA	0.63	0.15	0.17	0.092	0.16	0.08	0.099	<0.001	-	-	-
PFOA	0.84	0.073	0.13	0.064	0.084	0.052	0.069	<0.001	0.56	19	220
PFNA	0.50	<0.025	0.048	0.017	0.044	0.015	0.015	<0.001	-	-	-
PFDA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
PFUnDA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
PFTrDA	<0.10	<0.1	<0.1	<0.001	-	-	<0.0020	-	-	-	-
PFTeDA	<0.10	<0.1	<0.1	-	<0.001	<0.001	<0.0010	-	-	-	-
PFDoDA	<0.10	<0.1	<0.1	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
FOSA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
MeFOSA	<0.10	<0.1	<0.1	<0.001	<0.001	<0.001	-	<0.001	-	-	-
MeFOSAA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
EtFOSAA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
4:2 FTS	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	-	-	-	-
6:2 FTS	0.28	<0.05	0.15	0.012	0.25	0.0035	0.0087	<0.001	-	-	-
8:2 FTS	<0.10	<0.1	<0.1	<0.001	0.0032	<0.001	<0.0010	<0.001	-	-	-
10:2 FTS	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	-	<0.001	-	-	-
FPrPA	<0.10	<0.1	<0.1	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
EtFOSA	<0.10	<0.1	<0.1	<0.001	<0.001	<0.001	-	<0.001	-	-	-
EtFOSE	<0.10	<0.1	<0.1	<0.001	<0.001	<0.001	-	<0.001	-	-	-
FPePA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
FHpPA	<0.025	<0.025	<0.025	<0.001	<0.001	-	<0.0010	<0.001	-	-	-
F-53B minor	<0.050	<0.05	<0.05	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
HFPO-DA	<0.050	<0.05	<0.05	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
Sum F-53B	<0.10	<0.1	<0.1	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
ADONA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
P37DMOA	<0.050	<0.05	<0.05	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-
F-53B major	<0.10	<0.1	<0.1	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_BAI_GW111.2_2_170321	OHA_BAI_GW111.2_3_281021	OHA_BAI_GW111.2_4_300322	OHA_BAI_GW111.2_5_270922	OHA_GW111.2_040423	OHA_GW111.2_101123	OHA_BAI_GW111.3_1_170321	OHA_BAI_GW111.3_2_281021	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW111.2	GW111.2	GW111.2	GW111.2	GW111.2	GW111.2	GW111.3	GW111.3			
Sample Date	17/03/2021	28/10/2021	30/03/2022	28/09/2022	4/04/2023	10/11/2023	17/03/2021	28/10/2021			
Lab Report Number	2390370	2593741	2787340	3021350	3288820	3521624	2390370	2593741			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
L-PFOS	<0.001	0.0012	<0.001	<0.001	<0.001	<0.0010	<0.001	0.0021	-	-	-
Total PFOS[4]	<0.001	0.0012	<0.001	<0.001	<0.001	<0.0010	<0.001	0.0021	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	0.0012	<0.001	<0.001	<0.001	<0.0010	<0.001	0.0021	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	<0.001	-	<0.0010	<0.001	<0.001	-	-	-
PFBA	<0.001	<0.001	-	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFPeA	<0.001	<0.001	<0.001	<0.001	<0.001	0.0021	<0.001	<0.001	-	-	-
PFHxA	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<0.001	<0.001	-	-	-
PFHpA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	0.56	19	220
PFNA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFTrDA	-	-	-	-	-	<0.0020	-	-	-	-	-
PFTeDA	-	-	<0.001	-	-	<0.0010	-	<0.001	-	-	-
PFDoDA	-	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
MeFOSA	-	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
6:2 FTS	<0.001	0.0024	<0.001	<0.001	<0.001	<0.0010	<0.001	0.0037	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
10:2 FTS	-	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
EtFOSA	-	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-
EtFOSE	-	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
FHpPA	<0.001	<0.001	<0.001	<0.001	-	<0.0010	<0.001	<0.001	-	-	-
F-53B minor	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

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-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_BAI_GW111.3_3_300322	OHA_BAI_GW111.3_4_270922	OHA_GW111.3_040423	OHA_GW111.3_101123	MW9	MW9	OHA_MW9	MW9			
Location	GW111.3	GW111.3	GW111.3	GW111.3	MW9	MW9	MW9	MW9			
Sample Date	30/03/2022	27/09/2022	4/04/2023	10/11/2023	20/04/2017	1/11/2017	20/02/2018	4/07/2018	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	2787340	3021350	3288820	3521624	1327497	937355	1055089	1186581			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.0010	0.019	0.018	0.031	0.0091	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.0010	0.12	0.072	0.093	0.028	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.0010	0.16	0.11	0.14	0.043	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.0010	0.003	0.0025	0.003	<0.001	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.0010	0.21	0.16	0.26	0.058	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.0010	1.5	1.1	1.3	0.42	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	<0.0010	1.7	1.3	1.6	0.48	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.0010	0.072	0.06	0.071	0.021	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.0010	0.055	0.057	0.078	0.013	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	<0.0010	0.62	0.46	0.72	0.18	-	-	-
L-PFOS	0.0027	<0.001	<0.001	<0.0010	0.52	0.31	0.58	0.19	-	-	-
Total PFOS[4]	0.0027	<0.001	<0.001	<0.0010	**1.2**	**0.83**	**1.4**	**0.38**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.0027	<0.001	<0.001	<0.0010	2.9	-	3	0.86	0.07	-	-
PFECHS	<0.001	<0.001	-	<0.0010	-	-	-	-	-	-	-
PFBA	-	<0.001	<0.001	<0.0010	0.69	0.57	0.54	0.45	-	-	-
PFPeA	<0.001	<0.001	<0.001	<0.0010	3.5	2.9	2.6	1.7	-	-	-
PFHxA	<0.001	<0.001	<0.001	<0.0010	1.8	1.5	1.5	0.92	-	-	-
PFHpA	<0.001	<0.001	<0.001	<0.0010	1	0.57	0.68	0.44	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.0010	0.67	0.52	0.67	0.36	0.56	19	220
PFNA	<0.001	<0.001	<0.001	<0.0010	0.36	0.34	0.41	0.23	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.0010	0.0014	<0.001	<0.001	0.0011	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.005	<0.001	-	-	-
PFTrDA	-	-	-	-	-	-	-	<0.025	-	-	-
PFTeDA	<0.001	<0.001	<0.001	<0.0010	-	-	-	<0.1	-	-	-
PFDoDA	<0.001	<0.001	<0.001	-	-	<0.001	-	<0.025	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	-	-	<0.005	-	<0.005	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.0010	-	<0.005	<0.005	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.0010	-	<0.005	<0.005	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.0010	0.012	0.0095	0.011	0.004	-	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.0010	1.9	3.6	1.7	1.5	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.0010	0.0035	<0.005	<0.005	0.0022	-	-	-
10:2 FTS	<0.001	<0.001	<0.001	-	-	-	-	-	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-	-
EtFOSA	<0.001	<0.001	<0.001	-	-	<0.005	-	<0.005	-	-	-
EtFOSE	<0.001	<0.001	<0.001	-	-	<0.005	<0.025	<0.005	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-	-
FHpPA	<0.001	<0.001	-	<0.0010	-	-	-	-	-	-	-
F-53B minor	<0.001	<0.001	<0.001	-	-	-	-	-	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_DTK_MW9_5_300920	OHA_DTK_MW9_6_180321	OHA_DTK_MW9_7_271021	OHA_DTK_MW9_8_300322	OHA_DTK_MW9_9_270922	OHA_MW9_030423	OHA_MW9_071123	OHA_WS1	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	MW9	MW9	MW9	MW9	MW9	MW9	MW9	WS1			
Sample Date	30/09/2020	18/03/2021	27/10/2021	30/03/2022	27/09/2022	3/04/2023	7/11/2023	19/02/2018			
Lab Report Number	2132127	2314824	2590573	2786745	3019529	3276265	3518232	1055089			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	<0.025	<0.025	<0.025	0.022	0.0094	<0.025	<0.025	0.01	-	-	-
PFBS	0.034	0.064	0.046	0.049	0.02	0.045	0.036	0.022	-	-	-
PFPeS	0.038	0.069	0.057	0.074	0.029	0.048	0.034	0.02	-	-	-
di-PFHxS	<0.025	<0.025	<0.025	0.0015	<0.001	<0.025	<0.025	<0.001	-	-	-
Mono-PFHxS	0.071	0.14	0.1	0.14	0.053	0.09	0.077	0.027	-	-	-
L-PFHxS	0.47	0.91	0.79	0.89	0.42	0.72	0.50	0.11	-	-	-
Total PFHxS[4]	0.54	1	0.89	1	0.47	0.81	0.58	0.14	-	-	-
PFHpS	<0.025	0.034	0.029	0.042	0.02	0.03	<0.025	0.0022	-	-	-
di-PFOS	<0.025	0.045	0.042	0.049	0.023	0.039	<0.025	0.0029	-	-	-
Mono-PFOS	0.19	0.52	0.46	0.55	0.32	0.45	0.33	0.02	-	-	-
L-PFOS	0.24	0.46	0.53	0.59	0.34	0.56	0.39	0.0077	-	-	-
Total PFOS[4]	**0.43**	**1**	**1**	**1.2**	**0.68**	**1**	**0.72**	**0.031**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.97	2	1.9	2.2	1.2	1.8	1.3	0.17	0.07	-	-
PFECHS	-	<0.025	<0.025	<0.001	<0.001	<0.025	<0.025	-	-	-	-
PFBA	0.57	0.51	0.52	0.59	0.39	0.4	0.40	0.019	-	-	-
PFPeA	2.1	2.3	2	2.1	1	1.5	1.3	0.11	-	-	-
PFHxA	1	1.3	1	1.1	0.49	0.85	0.68	0.09	-	-	-
PFHpA	0.43	0.56	0.49	0.56	0.29	0.45	0.34	0.028	-	-	-
PFOA	0.33	0.48	0.47	0.51	0.3	0.45	0.33	0.02	0.56	19	220
PFNA	0.13	0.26	0.26	0.28	0.21	0.27	0.20	0.0064	-	-	-
PFDA	<0.025	<0.025	<0.025	0.0015	0.0013	<0.025	<0.025	<0.001	-	-	-
PFUnDA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.025	<0.025	<0.001	-	-	-
PFTrDA	<0.1	<0.1	<0.1	<0.001	-	<0.1	<0.10	-	-	-	-
PFTeDA	<0.1	<0.1	<0.1	<0.001	-	<0.1	<0.10	-	-	-	-
PFDoDA	<0.1	<0.1	<0.1	<0.001	<0.001	<0.1	<0.10	-	-	-	-
FOSA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.025	<0.025	<0.001	-	-	-
MeFOSA	<0.1	<0.1	<0.1	<0.001	<0.001	<0.1	<0.10	<0.005	-	-	-
MeFOSAA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.025	<0.025	<0.005	-	-	-
EtFOSAA	<0.025	<0.025	<0.025	<0.001	<0.001	<0.025	<0.025	<0.005	-	-	-
4:2 FTS	<0.025	<0.025	<0.025	0.0018	-	<0.025	<0.025	<0.005	-	-	-
6:2 FTS	1.1	3.2	2.3	2.6	0.98	1.7	1.2	0.12	-	-	-
8:2 FTS	<0.1	<0.1	<0.1	0.0043	0.0027	<0.1	<0.10	<0.005	-	-	-
10:2 FTS	-	<0.025	<0.025	<0.001	<0.001	<0.025	<0.025	-	-	-	-
FPrPA	-	<0.1	<0.1	<0.001	<0.001	<0.1	<0.10	-	-	-	-
EtFOSA	<0.1	<0.1	<0.1	<0.001	<0.001	<0.1	<0.10	<0.005	-	-	-
EtFOSE	<0.1	<0.1	<0.1	<0.001	<0.001	<0.1	<0.10	<0.005	-	-	-
FPePA	-	<0.025	<0.025	0.0032	0.0029	<0.025	<0.025	-	-	-	-
FHpPA	-	<0.025	<0.025	<0.001	<0.001	<0.025	<0.025	-	-	-	-
F-53B minor	-	<0.05	<0.05	<0.001	<0.001	<0.05	<0.050	-	-	-	-
HFPO-DA	-	<0.05	<0.05	<0.001	<0.001	<0.05	<0.050	-	-	-	-
Sum F-53B	-	<0.1	<0.1	<0.001	<0.001	<0.1	<0.10	-	-	-	-
ADONA	-	<0.025	<0.025	<0.001	<0.001	<0.025	<0.025	-	-	-	-
P37DMOA	-	<0.05	<0.05	<0.001	<0.001	<0.05	<0.050	-	-	-	-
F-53B major	-	<0.1	<0.1	<0.001	<0.001	<0.1	<0.10	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	WS01	WS1	OHA_FTA_WS1_4_290920	OHA_FTA_WS1_5_170321	OHA_FTA_WS1_6_271021	OHA_FTA_WS1_7_290322	OHA_FTA_WS1_8_270922	OHA_WS1_040423			
Location	WS1	WS1	WS1	WS1	WS1	WS1	WS1	WS1			
Sample Date	3/07/2018	21/07/2018	29/09/2020	17/03/2021	27/10/2021	29/03/2022	27/09/2022	4/04/2023	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	1186578	1326866	2096316	2318531	2590573	2775976	3009068	3277679			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.0098	0.0097	0.012	0.013	<0.025	0.014	0.014	0.014	-	-	-
PFBS	0.024	0.023	0.026	0.026	0.026	0.027	0.026	0.027	-	-	-
PFPeS	0.021	0.023	0.023	0.024	0.026	0.028	0.026	0.028	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	0.029	0.03	0.035	0.033	0.037	0.034	0.034	0.036	-	-	-
L-PFHxS	0.12	0.12	0.12	0.13	0.14	0.14	0.14	0.15	-	-	-
Total PFHxS[4]	0.15	0.15	0.16	0.16	0.18	0.17	0.17	0.19	-	-	-
PFHpS	0.0026	0.0034	0.0023	0.0018	<0.025	0.003	0.0028	0.0028	-	-	-
di-PFOS	0.0031	0.0024	0.0041	0.0029	<0.025	0.0032	0.0034	0.0041	-	-	-
Mono-PFOS	0.022	0.013	0.021	0.019	<0.025	0.025	0.031	0.03	-	-	-
L-PFOS	0.011	0.0071	0.0073	0.011	<0.025	0.013	0.017	0.0075	-	-	-
Total PFOS[4]	**0.036**	**0.022**	**0.032**	**0.033**	<0.025	**0.041**	**0.051**	**0.042**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.19	0.17	0.19	0.19	0.18	0.21	0.22	0.23	0.07	-	-
PFECHS	-	-	-	<0.001	<0.025	<0.001	<0.001	-	-	-	-
PFBA	0.018	0.018	0.018	0.018	<0.1	0.023	0.023	0.026	-	-	-
PFPeA	0.1	0.1	0.093	0.089	0.11	0.11	0.12	0.14	-	-	-
PFHxA	0.092	0.097	0.088	0.082	0.093	0.098	0.097	0.11	-	-	-
PFHpA	0.027	0.025	0.029	0.03	0.036	0.035	0.035	0.04	-	-	-
PFOA	0.022	0.018	0.021	0.024	0.029	0.028	0.029	0.031	0.56	19	220
PFNA	0.0078	0.0056	0.0062	0.0065	<0.025	0.0084	0.0097	0.0082	-	-	-
PFDA	<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	<0.025	-	-	-	<0.1	-	-	-	-	-	-
PFTeDA	<0.1	-	-	-	<0.1	<0.001	-	-	-	-	-
PFDoDA	<0.025	<0.005	<0.001	<0.001	<0.1	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
MeFOSA	-	<0.005	<0.001	-	<0.1	<0.001	<0.001	<0.001	-	-	-
MeFOSAA	<0.001	<0.005	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.005	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.025	0.0012	0.0012	0.0013	-	-	-
6:2 FTS	0.11	0.12	0.089	0.1	<1	0.13	0.13	0.097	-	-	-
8:2 FTS	<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	<0.001	-	-	-
FPrPA	-	-	-	<0.001	<0.1	<0.001	<0.001	<0.001	-	-	-
EtFOSA	-	<0.005	<0.001	-	<0.1	<0.001	<0.001	<0.001	-	-	-
EtFOSE	-	<0.005	<0.001	-	<0.1	<0.001	<0.001	<0.001	-	-	-
FPePA	-	-	-	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
FHpPA	-	-	-	<0.001	<0.025	<0.001	<0.001	-	-	-	-
F-53B minor	-	-	-	<0.001	<0.05	<0.001	<0.001	-	-	-	-
HFPO-DA	-	-	-	<0.001	<0.05	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	-	-	-	<0.001	<0.1	<0.001	<0.001	-	-	-	-
ADONA	-	-	-	<0.001	<0.025	<0.001	<0.001	<0.001	-	-	-
P37DMOA	-	-	-	<0.001	<0.05	<0.001	<0.001	-	-	-	-
F-53B major	-	-	-	<0.001	<0.1	<0.001	<0.001	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

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-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_WS1_091123	WS2-1	WS2	OHA_WS2	WS02	OHA_QRY_WS2_5_221119	OHA_QRY_WS2_6_020620	OHA_QRY_WS2_7_290920			
Location	WS1	WS2	WS2	WS2	WS2	WS2	WS2	WS2			
Sample Date	9/11/2023	24/07/2015	21/07/2017	21/02/2018	3/07/2018	22/11/2019	2/06/2020	29/09/2020	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	3521601	ES1526917	1326866	1055089	1186581	1740590	1983524	2096325			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	0.012	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	0.028	<0.02	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	-	-	-
PFPeS	0.025	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFHxS	<0.0010	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	0.042	-	<0.001	<0.001	0.0011	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	0.15	-	0.0038	0.0033	0.0053	0.0031	0.0021	0.0024	-	-	-
Total PFHxS[4]	0.19	<0.02	0.0038	0.0033	0.0064	0.0031	0.0021	0.0024	-	-	-
PFHpS	0.0030	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFOS	0.0027	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	0.035	-	<0.001	0.001	0.0016	<0.001	<0.001	<0.001	-	-	-
L-PFOS	0.017	-	<0.001	<0.001	0.0025	<0.001	0.0011	0.0016	-	-	-
Total PFOS[4]	**0.055**	<0.02	<0.001	0.001	0.0041	<0.001	0.0011	0.0016	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.24	-	0.0038	0.0043	0.01	0.0031	0.0032	0.004	0.07	-	-
PFECHS	<0.0020	-	-	-	-	-	-	-	-	-	-
PFBA	0.026	-	<0.005	<0.005	<0.005	0.0033	<0.005	0.0029	-	-	-
PFPeA	0.14	-	0.0072	0.0049	0.0076	0.0043	0.0027	0.0025	-	-	-
PFHxA	0.11	<0.02	0.004	0.0031	0.0055	0.0031	0.0017	0.0016	-	-	-
PFHpA	0.038	<0.02	0.002	0.0017	0.0028	0.0016	0.0011	<0.001	-	-	-
PFOA	0.031	<0.02	0.0018	0.0014	0.0024	0.0012	0.0036	<0.001	0.56	19	220
PFNA	0.0097	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFDA	<0.0010	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFUnDA	<0.0010	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	-	<0.05	-	-	-	<0.001	<0.001	-	-	-	-
PFTeDA	<0.0010	<0.5	-	-	-	<0.001	<0.001	-	-	-	-
PFDoDA	<0.0010	<0.05	<0.005	-	-	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.0010	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.0010	<0.5	<0.005	<0.005	-	<0.001	<0.001	-	-	-	-
MeFOSAA	<0.0010	-	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.0010	-	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	0.0013	-	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	0.13	<0.1	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.0010	<0.1	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	<0.0010	-	-	-	-	-	-	-	-	-	-
FPrPA	<0.0010	-	-	-	-	-	-	-	-	-	-
EtFOSA	<0.0010	<0.05	<0.005	<0.005	-	<0.001	<0.001	-	-	-	-
EtFOSE	<0.0010	<0.5	<0.005	<0.005	<0.005	<0.001	<0.001	-	-	-	-
FPePA	<0.0010	-	-	-	-	-	-	-	-	-	-
FHpPA	<0.0010	-	-	-	-	-	-	-	-	-	-
F-53B minor	<0.0010	-	-	-	-	-	-	-	-	-	-
HFPO-DA	<0.0010	-	-	-	-	-	-	-	-	-	-
Sum F-53B	<0.0020	-	-	-	-	-	-	-	-	-	-
ADONA	<0.0010	-	-	-	-	-	-	-	-	-	-
P37DMOA	-	-	-	-	-	-	-	-	-	-	-
F-53B major	<0.0020	-	-	-	-	-	-	-	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_QRY_WS2_8_181120	OHA_QRY_WS2_9_180321	OHA_QRY_WS2_10_220621	OHA_QRY_WS2_11_281021	OHA_QRY_WS2_12_300322	OHA_QRY_WS2_14_280922	OHA_WS2_040423	OHA_WS2_081123			
Location	WS2	WS2	WS2	WS2	WS2	WS2	WS2	WS2			
Sample Date	18/11/2020	18/03/2021	22/06/2021	28/10/2021	30/03/2022	28/09/2022	4/04/2023	8/11/2023	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	2172205	2327922	2434042	2593734	2786751	3019773	3277677	3519860			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
L-PFHxS	0.0041	0.0029	0.0027	0.0044	0.0037	0.0036	0.0032	0.0032	-	-	-
Total PFHxS[4]	0.0041	0.0029	0.0027	0.0044	0.0037	0.0036	0.0032	0.0032	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	0.0011	0.0013	0.0016	0.0012	0.0013	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.001	0.002	0.0017	0.0018	0.0017	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	0.0011	0.0033	0.0033	0.003	0.0030	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.0041	0.0029	0.0027	0.0055	0.007	0.0069	0.0062	0.0062	0.07	-	-
PFECHS	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-
PFBA	0.0035	0.0034	<0.005	0.0039	0.0048	0.0037	0.0035	-	-	-	-
PFPeA	0.0041	0.004	0.0032	0.0048	0.0052	0.0039	0.0038	0.0031	-	-	-
PFHxA	0.003	0.0026	0.002	0.0034	0.0036	0.0027	0.0023	0.0022	-	-	-
PFHpA	0.0019	0.0015	0.0014	0.0017	0.0019	0.0017	0.0016	0.0013	-	-	-
PFOA	0.0015	0.0012	0.0013	0.0016	0.0017	0.0015	0.0015	0.0014	0.56	19	220
PFNA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
PFUnDA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
PFTrDA	-	-	<0.001	-	<0.001	-	-	<0.0050	-	-	-
PFTeDA	-	-	-	<0.001	<0.001	<0.001	-	<0.0010	-	-	-
PFDoDA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
MeFOSA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
8:2 FTS	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
10:2 FTS	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
FPrPA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
EtFOSA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
EtFOSE	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
FPePA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
FHpPA	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
F-53B minor	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-
HFPO-DA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
Sum F-53B	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-
ADONA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
P37DMOA	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
F-53B major	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW106_1_160321	OHA_ADJ_GW106_2_291021	OHA_ADJ_GW106_3_290322	OHA_ADJ_GW106_4_290922	OHA_GW106_050423	OHA_GW106_091123	OHA_ADJ_GW107_1_011020	OHA_ADJ_GW107_2_291021			
Location	GW106	GW106	GW106	GW106	GW106	GW106	GW107	GW107			
Sample Date	16/03/2021	29/10/2021	29/03/2022	29/09/2022	5/04/2023	9/11/2023	1/10/2020	29/10/2021	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	2316433	2590583	2780982	3011677	3288825	3521619	2096735	2590579			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	<0.001	-	-	-
PFBA	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFPeA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFHxA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFHpA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	0.56	19	220
PFNA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
PFTrDA	-	<0.001	<0.001	-	-	<0.0020	-	<0.001	-	-	-
PFTeDA	-	<0.001	-	-	-	<0.0010	-	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
10:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
EtFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
EtFOSE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
FHpPA	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	<0.001	-	-	-
F-53B minor	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

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5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

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-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW107_3_300322	OHA_ADJ_GW107_4_300922	OHA_GW107_050423	OHA_GW107_091123	OHA_ADJ_GW108_1_011020	OHA_ADJ_GW108_2_150321	OHA_ADJ_GW108_3_291021	OHA_ADJ_GW108_4_290322			
Location	GW107	GW107	GW107	GW107	GW108	GW108	GW108	GW108			
Sample Date	30/03/2022	30/09/2022	5/04/2023	9/11/2023	1/10/2020	15/03/2021	29/10/2021	29/03/2022	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	2786744	3020439	3283490	3521604	2096735	2313652	2590569	2780972			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	<0.0020	-	<0.001	<0.001	<0.001	-	-	-
PFBA	<0.001	<0.001	<0.001	<0.0010	<0.001	0.0011	<0.001	0.002	-	-	-
PFPeA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHxA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	0.56	19	220
PFNA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
PFUnDA	<0.001	-	<0.001	<0.0010	-	<0.001	<0.001	<0.001	-	-	-
PFTrDA	<0.001	-	-	-	-	-	<0.001	<0.001	-	-	-
PFTeDA	<0.001	-	-	<0.0010	-	-	<0.001	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.0010	-	-	<0.001	-	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	-	-	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	<0.001	<0.001	<0.001	<0.0010	-	-	<0.001	<0.001	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	-	-	-
EtFOSA	<0.001	<0.001	<0.001	<0.0010	-	-	<0.001	-	-	-	-
EtFOSE	<0.001	<0.001	<0.001	<0.0010	<0.001	-	<0.001	<0.001	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	-	-	-
FHpPA	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	-	-	-
F-53B minor	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.0020	-	<0.001	<0.001	<0.001	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	-	-	-
P37DMOA	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW108_5_290922	OHA_GW108_050423	OHA_GW108_091123	OHA_ADJ_GW109_1_011020	OHA_ADJ_GW109_2_150321	OHA_ADJ_GW109_3_291021	OHA_ADJ_GW109_4_290322	OHA_ADJ_GW109_5_280922			
Location	GW108	GW108	GW108	GW109	GW109	GW109	GW109	GW109			
Sample Date	29/09/2022	5/04/2023	9/11/2023	1/10/2020	15/03/2021	29/10/2021	29/03/2022	28/09/2022	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	3011674	3288826	3521589	2096735	2313643	2593930	2780975	3007288			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFHxS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFOS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
L-PFOS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	<0.001	-	<0.0020	-	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBA	<0.001	<0.001	0.0015	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFPeA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHxA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFOA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	0.56	19	220
PFNA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFDA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFUnDA	-	<0.001	<0.0010	-	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	-	-	-	-	-	-	<0.001	-	-	-	-
PFTeDA	-	-	<0.0010	-	-	<0.001	-	<0.001	-	-	-
PFDoDA	-	<0.001	<0.0010	-	-	<0.001	<0.001	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.0010	-	-	<0.001	<0.001	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
6:2 FTS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	-	<0.001	<0.0010	-	-	<0.001	<0.001	<0.001	-	-	-
FPrPA	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSA	<0.001	<0.001	<0.0010	-	-	<0.001	<0.001	<0.001	-	-	-
EtFOSE	<0.001	<0.001	<0.0010	<0.001	-	<0.001	<0.001	<0.001	-	-	-
FPePA	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	<0.001	-	-	-
FHpPA	<0.001	-	<0.0010	-	<0.001	<0.001	<0.001	<0.001	-	-	-
F-53B minor	-	<0.001	<0.0010	-	<0.001	<0.001	<0.001	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	<0.001	<0.001	<0.0020	-	<0.001	<0.001	<0.001	<0.001	-	-	-
ADONA	<0.001	<0.001	<0.0010	-	<0.001	<0.001	<0.001	<0.001	-	-	-
P37DMOA	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
F-53B major	<0.001	<0.001	<0.0020	-	<0.001	<0.001	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_GW109_030423	OHA_GW109_091123	OHA_ADJ_GW112.1_1_180321	OHA_ADJ_GW112.1_2_281021	OHA_ADJ_GW112.1_3_290322	OHA_ADJ_GW112.1_4_280922	OHA_GW112.1_040423	OHA_GW112.1_081123			
Location	GW109	GW109	GW112.1	GW112.1	GW112.1	GW112.1	GW112.1	GW112.1			
Sample Date	3/04/2023	9/11/2023	18/03/2021	28/10/2021	29/03/2022	28/09/2022	4/04/2023	8/11/2023	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	3277682	3521598	2335132	2593744	2785103	3020548	3277686	3519873			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<0.0010	<0.001	0.012	<0.025	<0.025	<0.025	<0.025	-	-	-
PFBS	<0.001	<0.0010	<0.001	0.028	0.028	0.031	0.027	0.027	-	-	-
PFPeS	<0.001	<0.0010	<0.001	0.033	0.028	0.028	<0.025	0.028	-	-	-
di-PFHxS	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
Mono-PFHxS	<0.001	<0.0010	<0.001	0.052	0.045	0.043	0.041	0.043	-	-	-
L-PFHxS	<0.001	<0.0010	<0.001	0.25	0.25	0.24	0.27	0.23	-	-	-
Total PFHxS[4]	<0.001	<0.0010	<0.001	0.3	0.3	0.28	0.31	0.27	-	-	-
PFHpS	<0.001	<0.0010	<0.001	0.0076	<0.025	<0.025	<0.025	<0.025	-	-	-
di-PFOS	<0.001	<0.0010	<0.001	0.011	<0.025	<0.025	<0.025	<0.025	-	-	-
Mono-PFOS	<0.001	<0.0010	<0.001	0.14	0.088	0.093	0.095	0.10	-	-	-
L-PFOS	<0.001	<0.0010	<0.001	0.21	0.094	0.1	0.14	0.14	-	-	-
Total PFOS[4]	<0.001	<0.0010	<0.001	**0.36**	**0.18**	**0.19**	**0.24**	**0.24**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.0010	<0.001	0.66	0.48	0.47	0.55	0.51	0.07	-	-
PFECHS	-	<0.0020	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
PFBA	<0.001	<0.0010	<0.001	0.11	<0.2	0.12	0.12	0.11	-	-	-
PFPeA	<0.001	<0.0010	<0.001	0.42	0.42	0.44	0.42	0.42	-	-	-
PFHxA	<0.001	<0.0010	<0.001	0.33	0.34	0.34	0.39	0.35	-	-	-
PFHpA	<0.001	<0.0010	<0.001	0.17	0.16	0.16	0.17	0.15	-	-	-
PFOA	<0.001	<0.0010	<0.001	0.094	0.093	0.086	0.089	0.085	0.56	19	220
PFNA	<0.001	<0.0010	<0.001	0.037	0.026	0.03	0.031	0.034	-	-	-
PFDA	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
PFUnDA	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
PFTrDA	-	-	-	-	<0.1	<0.1	<0.1	<0.10	-	-	-
PFTeDA	-	-	-	-	<0.1	<0.1	<0.1	<0.10	-	-	-
PFDoDA	<0.001	<0.0010	-	<0.001	<0.1	<0.1	<0.1	<0.10	-	-	-
FOSA	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
MeFOSA	<0.001	<0.0010	-	<0.001	<0.1	<0.1	<0.1	<0.10	-	-	-
MeFOSAA	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
EtFOSAA	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
4:2 FTS	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
6:2 FTS	<0.001	<0.0010	<0.001	0.1	0.11	0.12	0.11	0.096	-	-	-
8:2 FTS	<0.001	<0.0010	<0.001	<0.001	<0.1	<0.1	<0.1	<0.10	-	-	-
10:2 FTS	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
FPrPA	<0.001	<0.0010	<0.001	<0.001	<0.1	<0.1	<0.1	<0.10	-	-	-
EtFOSA	<0.001	<0.0010	-	<0.001	<0.1	<0.1	<0.1	<0.10	-	-	-
EtFOSE	<0.001	<0.0010	-	<0.001	<0.1	<0.1	<0.1	<0.10	-	-	-
FPePA	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
FHpPA	-	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
F-53B minor	-	<0.0010	<0.001	<0.001	<0.05	<0.05	<0.05	<0.050	-	-	-
HFPO-DA	<0.001	<0.0010	<0.001	<0.001	<0.05	<0.05	<0.05	<0.050	-	-	-
Sum F-53B	-	<0.0020	<0.001	<0.001	<0.1	<0.1	<0.1	<0.10	-	-	-
ADONA	<0.001	<0.0010	<0.001	<0.001	<0.025	<0.025	<0.025	<0.025	-	-	-
P37DMOA	-	-	<0.001	<0.001	<0.05	<0.05	<0.05	<0.050	-	-	-
F-53B major	-	<0.0020	<0.001	<0.001	<0.1	<0.1	<0.1	<0.10	-	-	-

Notes:

1. Results in µg/L.

2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.

3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.

4. 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.

5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.

6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW112.2_1_180321	OHA_ADJ_GW112.2_2_281021	OHA_ADJ_GW112.2_3_280322	OHA_ADJ_GW112.2_4_280922	OHA_GW112.2_040423	OHA_GW112.2_081123	OHA_ADJ_GW31_1_120218	OHA_ADJ_GW31_2_230518			
Location	GW112.2	GW112.2	GW112.2	GW112.2	GW112.2	GW112.2	GW31	GW31			
Sample Date	18/03/2021	28/10/2021	28/03/2022	28/09/2022	4/04/2023	8/11/2023	12/02/2018	23/05/2018	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	2335132	2593744	2785781	3020548	3277686	3519873	1032528	1153593			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	0.012	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0033	0.0038	-	-	-
PFBS	0.03	<0.001	<0.001	<0.001	<0.001	<0.0010	0.011	0.01	-	-	-
PFPeS	0.035	<0.001	<0.001	<0.001	<0.001	<0.0010	0.014	0.0089	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
Mono-PFHxS	0.056	<0.001	<0.001	<0.001	<0.001	<0.0010	0.016	0.013	-	-	-
L-PFHxS	0.29	<0.001	<0.001	<0.001	<0.001	<0.0010	0.064	0.055	-	-	-
Total PFHxS[4]	0.35	<0.001	<0.001	<0.001	<0.001	<0.0010	0.08	0.068	-	-	-
PFHpS	0.0075	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0014	0.0011	-	-	-
di-PFOS	0.012	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0042	0.002	-	-	-
Mono-PFOS	0.16	<0.001	<0.001	<0.001	<0.001	<0.0010	0.033	0.016	-	-	-
L-PFOS	0.21	<0.001	<0.001	<0.001	<0.001	<0.0010	0.023	0.0079	-	-	-
Total PFOS[4]	**0.38**	<0.001	<0.001	<0.001	<0.001	<0.0010	**0.06**	**0.026**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.73	<0.001	<0.001	<0.001	<0.001	<0.0010	0.14	0.094	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-	-	-
PFBA	0.11	<0.001	<0.001	<0.001	<0.001	-	0.055	0.035	-	-	-
PFPeA	0.4	<0.001	<0.001	<0.001	<0.001	<0.0010	0.21	0.097	-	-	-
PFHxA	0.34	<0.001	<0.001	<0.001	<0.001	<0.0010	0.14	0.074	-	-	-
PFHpA	0.17	<0.001	<0.001	<0.001	<0.001	<0.0010	0.053	0.027	-	-	-
PFOA	0.092	<0.001	<0.001	<0.001	<0.001	<0.0010	0.024	0.013	0.56	19	220
PFNA	0.041	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0059	0.0021	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
PFTrDA	-	-	<0.001	-	-	<0.0050	-	<0.025	-	-	-
PFTeDA	-	-	-	-	-	<0.0010	-	<0.1	-	-	-
PFDoDA	-	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.025	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.025	<0.005	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.005	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	<0.001	-	-	-
6:2 FTS	0.066	0.0052	<0.001	<0.001	<0.001	<0.0010	0.036	0.0092	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	<0.001	-	-	-
10:2 FTS	-	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-
EtFOSA	-	<0.001	-	<0.001	<0.001	<0.0010	<0.025	<0.001	-	-	-
EtFOSE	-	<0.001	<0.001	<0.001	<0.001	-	<0.025	<0.005	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-
FHpPA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
F-53B minor	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW31_3_12918	OHA_ADJ_GW31_4_290920	OHA_ADJ_GW31_5_160321	OHA_ADJ_GW31_6_291021	OHA_ADJ_GW31_7_290322	OHA_ADJ_GW31_8_290922	OHA_GW31_040423	OHA_GW31_091123	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW31	GW31	GW31	GW31	GW31	GW31	GW31	GW31			
Sample Date	12/09/2018	29/09/2020	16/03/2021	29/10/2021	29/03/2022	29/09/2022	4/04/2023	9/11/2023			
Lab Report Number	1252502	2096319	2316425	2593739	2786750	3007286	3277680	3521587			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	0.0058	0.0045	0.0042	0.0054	0.0046	<0.001	0.0042	0.0031	-	-	-
PFBS	0.0095	0.01	0.011	0.009	0.0095	<0.001	0.0081	0.0088	-	-	-
PFPeS	0.0084	0.0085	0.0096	0.0083	0.0085	<0.001	0.0075	0.0065	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
Mono-PFHxS	0.014	0.016	0.017	0.013	0.013	<0.001	0.011	0.014	-	-	-
L-PFHxS	0.056	0.063	0.073	0.059	0.058	<0.001	0.048	0.050	-	-	-
Total PFHxS[4]	0.07	0.079	0.09	0.072	0.071	<0.001	0.059	0.064	-	-	-
PFHpS	0.0011	0.0015	0.0016	0.0013	0.0013	<0.001	0.0011	<0.0010	-	-	-
di-PFOS	<0.001	0.0034	0.0034	0.0026	0.0025	<0.001	0.002	0.0020	-	-	-
Mono-PFOS	0.016	0.028	0.037	0.025	0.024	<0.001	0.018	0.022	-	-	-
L-PFOS	0.0058	0.013	0.028	0.011	0.015	<0.001	0.0085	0.0078	-	-	-
Total PFOS[4]	**0.022**	**0.044**	**0.068**	**0.039**	**0.042**	<0.001	**0.028**	**0.032**	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.092	0.12	0.16	0.11	0.11	<0.001	0.087	0.096	0.07	-	-
PFECHS	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.0020	-	-	-
PFBA	0.035	0.047	0.06	0.042	0.047	<0.001	0.04	0.040	-	-	-
PFPeA	0.083	0.15	0.25	0.13	0.15	<0.001	0.11	0.11	-	-	-
PFHxA	0.067	0.12	0.17	0.083	0.1	<0.001	0.072	0.077	-	-	-
PFHpA	0.024	0.042	0.063	0.031	0.036	<0.001	0.027	0.029	-	-	-
PFOA	0.011	0.019	0.025	0.016	0.017	<0.001	0.012	0.013	0.56	19	220
PFNA	0.0014	0.0039	0.0076	0.0029	0.0041	<0.001	0.0026	0.0026	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
PFTrDA	<0.005	-	-	-	<0.001	-	-	-	-	-	-
PFTeDA	<0.005	-	-	<0.001	-	<0.001	-	<0.0010	-	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
6:2 FTS	0.0052	0.0049	0.0052	0.0036	0.0038	<0.001	0.0033	0.0032	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
10:2 FTS	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
FPrPA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
EtFOSA	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.0010	-	-	-
EtFOSE	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.0010	-	-	-
FPePA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
FHpPA	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-
F-53B minor	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-
HFPO-DA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
Sum F-53B	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.0020	-	-	-
ADONA	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
P37DMOA	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
F-53B major	-	-	<0.001	<0.001	<0.001	<0.001	-	<0.0020	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
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_GW53_6_291021	OHA_ADJ_GW53_7_290322	OHA_ADJ_GW53_8_290922			
Location	GW53	GW53	GW53	GW53	GW53	GW53	GW53	GW53			
Sample Date	15/02/2018	15/05/2018	10/09/2018	30/09/2020	16/03/2021	29/10/2021	29/03/2022	29/09/2022			
Lab Report Number	1040534	1139707	1244388	2096317	2316429	2593735	2780973	3011675			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	<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	-	-	-
di-PFHxS	<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	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFHpS	<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	-	-	-
Mono-PFOS	<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	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBA	<0.005	<0.005	<0.005	<0.001	<0.002	<0.001	<0.001	<0.001	-	-	-
PFPeA	<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	-	-	-
PFHpA	<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	0.56	19	220
PFNA	<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	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFTrDA	<0.025	<0.025	-	-	-	-	-	-	-	-	-
PFTeDA	-	-	-	-	-	<0.001	-	<0.001	-	-	-
PFDoDA	<0.025	<0.025	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.025	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<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	<0.001	<0.001	-	-	-
6:2 FTS	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
10:2 FTS	-	-	-	-	<0.001	<0.001	-	<0.001	-	-	-
FPrPA	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSE	<0.025	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
FPePA	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
FHpPA	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
F-53B minor	-	-	-	-	<0.001	<0.001	-	<0.001	-	-	-
HFPO-DA	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
Sum F-53B	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
ADONA	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
P37DMOA	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-
F-53B major	-	-	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_GW53_040423	OHA_GW53_081123	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			
Location	GW53	GW53	GW6	GW6	GW6	GW6	GW6	GW6			
Sample Date	4/04/2023	8/11/2023	11/12/2017	13/02/2018	14/05/2018	13/09/2018	29/09/2020	16/03/2021	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	3277675	3519871	989127	1032179	1133549	1260155	2096315	2313648			
Monitoring Zone	Off-base	Off-base	On-base	On-base	On-base	On-base	On-base	On-base			
Sample Results											
PFPrS	<0.001	<0.001	0.0022	0.0034	-	0.004	0.0025	0.0016	-	-	-
PFBS	<0.001	<0.001	0.0067	0.0065	0.0022	0.0038	0.0027	0.0023	-	-	-
PFPeS	<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	-	-	-
Mono-PFHxS	<0.001	<0.001	0.011	0.0097	0.002	0.0026	0.0023	0.0035	-	-	-
L-PFHxS	<0.001	<0.001	0.066	0.054	0.014	0.014	0.014	0.014	-	-	-
Total PFHxS[4]	<0.001	<0.001	0.077	0.064	0.016	0.017	0.016	0.018	-	-	-
PFHpS	<0.001	<0.001	0.0018	0.0023	<0.001	<0.001	<0.001	<0.001	-	-	-
di-PFOS	<0.001	<0.001	0.0027	0.0022	<0.001	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	<0.001	<0.001	0.026	0.025	0.0089	0.003	0.0044	0.0038	-	-	-
L-PFOS	<0.001	<0.001	0.023	0.023	0.0092	0.0014	0.0042	0.0043	-	-	-
Total PFOS[4]	<0.001	<0.001	**0.052**	**0.05**	**0.018**	0.0044	0.0086	0.0081	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	0.13	0.11	0.034	0.021	0.025	0.026	0.07	-	-
PFECHS	-	<0.001	-	-	-	-	-	<0.001	-	-	-
PFBA	<0.001	-	0.025	0.02	-	<0.01	-	0.011	-	-	-
PFPeA	<0.001	<0.001	0.057	0.044	0.0035	0.0037	0.003	<0.001	-	-	-
PFHxA	<0.001	<0.001	0.044	0.038	0.0039	0.0053	0.0038	0.0072	-	-	-
PFHpA	<0.001	<0.001	0.02	0.016	0.0018	0.0021	0.0024	0.003	-	-	-
PFOA	<0.001	<0.001	0.014	0.014	0.0022	0.0018	0.0019	0.0031	0.56	19	220
PFNA	<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	-	-	-
PFUnDA	<0.001	-	<0.005	<0.001	<0.001	<0.001	<0.001	-	-	-	-
PFTrDA	-	-	-	-	<0.025	<0.005	-	-	-	-	-
PFTeDA	-	-	-	-	<0.025	<0.005	-	-	-	-	-
PFDoDA	<0.001	-	-	<0.001	<0.025	<0.001	-	-	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	-	-	<0.005	<0.001	<0.001	-	-	-	-
MeFOSAA	<0.001	<0.001	<0.005	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.005	<0.025	<0.001	<0.001	<0.001	<0.001	-	-	-
4:2 FTS	<0.001	<0.001	<0.005	<0.001	<0.001	-	-	-	-	-	-
6:2 FTS	<0.001	<0.001	0.023	0.0032	<0.01	0.001	-	-	-	-	-
8:2 FTS	<0.001	<0.001	<0.005	<0.001	<0.001	<0.001	-	<0.001	-	-	-
10:2 FTS	<0.001	-	-	-	-	-	-	-	-	-	-
FPrPA	<0.001	<0.001	-	-	-	-	-	<0.001	-	-	-
EtFOSA	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	-	-	-	-
EtFOSE	<0.001	<0.001	-	<0.025	<0.005	<0.001	<0.001	-	-	-	-
FPePA	<0.001	<0.001	-	-	-	-	-	<0.001	-	-	-
FHpPA	-	-	-	-	-	-	-	<0.001	-	-	-
F-53B minor	-	-	-	-	-	-	-	<0.001	-	-	-
HFPO-DA	<0.001	<0.001	-	-	-	-	-	<0.001	-	-	-
Sum F-53B	-	<0.001	-	-	-	-	-	<0.001	-	-	-
ADONA	<0.001	<0.001	-	-	-	-	-	<0.001	-	-	-
P37DMOA	-	-	-	-	-	-	-	<0.001	-	-	-
F-53B major	-	<0.001	-	-	-	-	-	<0.001	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW6_7_281021	OHA_ADJ_GW6_8_290322	OHA_ADJ_GW6_9_280922	OHA_GW6_040423	OHA_GW6_091123	OHA_ADJ_GW65_1_210218	OHA_ADJ_GW65_2_170518	OHA_ADJ_GW65_3_11918	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Location	GW6	GW6	GW6	GW6	GW6	GW65	GW65	GW65			
Sample Date	28/10/2021	29/03/2022	28/09/2022	4/04/2023	9/11/2023	21/02/2018	17/05/2018	11/09/2018			
Lab Report Number	2590577	2780968	3007292	3277674	3521816	1047797	1142284	1244707			
Monitoring Zone	On-base	On-base	On-base	On-base	On-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	0.0025	-	0.0019	0.0028	0.0018	<0.001	<0.001	<0.001	-	-	-
PFBS	0.0028	0.0021	0.0026	0.0038	0.0026	<0.001	<0.001	<0.001	-	-	-
PFPeS	0.0033	0.0042	0.003	0.0081	0.0034	<0.001	<0.001	<0.001	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	-	-	-
Mono-PFHxS	0.0026	0.004	0.0035	0.0072	0.0032	<0.001	<0.001	<0.001	-	-	-
L-PFHxS	0.013	0.027	0.02	0.047	0.017	<0.001	<0.001	<0.001	-	-	-
Total PFHxS[4]	0.016	0.031	0.024	0.054	0.020	<0.001	<0.001	<0.001	-	-	-
PFHpS	<0.001	0.0014	<0.001	0.0022	<0.0010	<0.001	<0.001	<0.001	-	-	-
di-PFOS	<0.001	<0.001	<0.001	0.0027	<0.0010	<0.001	<0.001	<0.001	-	-	-
Mono-PFOS	0.0051	0.014	0.011	0.035	0.0075	<0.001	<0.001	<0.001	-	-	-
L-PFOS	0.009	0.017	0.0041	0.041	0.0069	<0.001	<0.001	<0.001	-	-	-
Total PFOS[4]	**0.014**	**0.031**	**0.015**	**0.079**	**0.014**	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.03	0.062	0.039	0.13	0.034	<0.001	<0.001	<0.001	0.07	-	-
PFECHS	<0.001	<0.001	<0.001	-	<0.0020	-	-	-	-	-	-
PFBA	0.0053	-	0.0061	0.019	0.0063	<0.005	<0.01	<0.005	-	-	-
PFPeA	0.0068	0.018	0.009	0.039	0.0050	<0.001	<0.001	<0.001	-	-	-
PFHxA	0.0078	0.017	0.01	0.032	0.0055	<0.001	<0.001	<0.001	-	-	-
PFHpA	0.0033	0.0091	0.0047	0.016	0.0033	<0.001	<0.001	<0.001	-	-	-
PFOA	0.0019	0.0088	0.003	0.014	0.0027	<0.001	<0.001	<0.001	0.56	19	220
PFNA	<0.001	0.0033	<0.001	0.0058	<0.0010	<0.001	<0.001	<0.001	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	-	-	-
PFTrDA	<0.001	<0.001	-	-	-	-	<0.025	<0.001	-	-	-
PFTeDA	-	-	-	-	-	-	-	<0.005	-	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.025	<0.001	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.005	<0.005	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	<0.001	<0.001	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	<0.001	<0.001	-	-	-
4:2 FTS	-	-	-	<0.001	<0.0010	<0.005	<0.001	<0.001	-	-	-
6:2 FTS	0.0013	<0.001	<0.001	0.0013	<0.0010	<0.005	<0.001	<0.001	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	<0.001	<0.001	-	-	-
10:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-
EtFOSA	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.001	<0.005	-	-	-
EtFOSE	<0.001	<0.001	<0.001	<0.001	<0.0010	-	<0.005	<0.001	-	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-
FHpPA	<0.001	<0.001	<0.001	-	<0.0010	-	-	-	-	-	-
F-53B minor	<0.001	<0.001	<0.001	-	<0.0010	-	-	-	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	-	<0.0020	-	-	-	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-	-	-	-
P37DMOA	<0.001	<0.001	<0.001	-	-	-	-	-	-	-	-
F-53B major	<0.001	<0.001	<0.001	-	<0.0020	-	-	-	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW65_4_290920	OHA_ADJ_GW65_5_150321	OHA_ADJ_GW65_6_291021	OHA_ADJ_GW65_7_290322	OHA_ADJ_GW65_8_290922	OHA_GW65_050423	OHA_GW65_091123	OHA_ADJ_GW67_1_210218			
Location	GW65	GW65	GW65	GW65	GW65	GW65	GW65	GW67			
Sample Date	29/09/2020	15/03/2021	29/10/2021	29/03/2022	29/09/2022	5/04/2023	9/11/2023	21/02/2018	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Lab Report Number	2096328	2313647	2593738	2780969	3011675	3283483	3521600	1047809			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base			
Sample Results											
PFPrS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
PFBS	<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	-	-	-
di-PFHxS	<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	-	-	-
L-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0016	-	-	-
Total PFHxS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0016	-	-	-
PFHpS	<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	-	-	-
Mono-PFOS	<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	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0016	0.07	-	-
PFECHS	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
PFBA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
PFPeA	<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	-	-	-
PFHpA	<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	0.56	19	220
PFNA	<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	-	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	-	-
PFTrDA	-	-	-	<0.001	-	-	<0.002	-	-	-	-
PFTeDA	-	-	<0.001	-	-	<0.001	<0.001	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-
MeFOSA	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	-	-	-
4:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	-	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	-	-	-
10:2 FTS	-	-	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
FPrPA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
EtFOSA	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	-	-	-	-
EtFOSE	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
FPePA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
FHpPA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
F-53B minor	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
HFPO-DA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
Sum F-53B	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
ADONA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
P37DMOA	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
F-53B major	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

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

	PFAS in Groundwater								Guidelines		
Sample Name	OHA_ADJ_GW67_2_140518	OHA_ADJ_GW67_3_110918	OHA_ADJ_GW67_4_300920	OHA_ADJ_GW67_5_170321	OHA_ADJ_GW67_6_271021	OHA_ADJ_GW67_7_290322	OHA_ADJ_GW67_8_280922	OHA_GW67_091123			
Location	GW67	GW67	GW67	GW67	GW67	GW67	GW67	GW67			
Sample Date	14/05/2018	11/09/2018	30/09/2020	17/03/2021	27/10/2021	29/03/2022	28/09/2022	9/11/2023			
Lab Report Number	1134445	1244090	2096741	2317694	2618128	2780991	2999090	3521593			
Monitoring Zone	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	Off-base	NZ Drinking Water Standard, MoH 2022 [2]	ANZ WQG 99% Species Protection - Technical Draft Default Guideline Values [3]	ANZ WQG 95% Species Protection - Technical Draft Default Guideline Values [3]
Sample Results											
PFPrS	<0.001	-	<0.001	0.0013	<0.001	<0.001	<0.025	<0.0010	-	-	-
PFBS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
PFPeS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
Mono-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
L-PFHxS	0.0018	0.0012	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
Total PFHxS[4]	0.0018	0.0012	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
Mono-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
L-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
Total PFOS[4]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	0.0091 [6]	0.48 [6]
Sum of PFHxS and PFOS[5]	0.0018	0.0012	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	0.07	-	-
PFECHS	-	-	-	<0.001	<0.001	<0.001	<0.025	<0.0020	-	-	-
PFBA	-	-	<0.001	0.0072	-	0.0087	<0.1	0.011	-	-	-
PFPeA	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.1	<0.0010	-	-	-
PFHxA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
PFHpA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
PFOA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	0.56	19	220
PFNA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
PFUnDA	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
PFTrDA	<0.025	<0.005	-	-	-	<0.001	<0.1	-	-	-	-
PFTeDA	<0.025	<0.005	-	-	<0.001	-	<0.1	<0.0010	-	-	-
PFDoDA	<0.025	<0.001	-	<0.001	<0.001	<0.001	<0.1	<0.0010	-	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
MeFOSA	<0.005	<0.005	-	-	<0.001	<0.001	<0.1	<0.0010	-	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
4:2 FTS	<0.001	-	-	<0.001	<0.001	-	<0.025	<0.0010	-	-	-
6:2 FTS	<0.01	<0.001	<0.001	<0.001	-	<0.001	<0.05	<0.0010	-	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.1	<0.0010	-	-	-
10:2 FTS	-	-	-	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
FPrPA	-	-	-	<0.001	<0.001	<0.001	<0.1	<0.0010	-	-	-
EtFOSA	<0.001	<0.005	-	-	<0.001	<0.001	<0.1	<0.0010	-	-	-
EtFOSE	<0.005	<0.001	<0.001	-	<0.001	<0.001	<0.1	<0.0010	-	-	-
FPePA	-	-	-	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
FHpPA	-	-	-	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
F-53B minor	-	-	-	<0.001	<0.001	<0.001	<0.05	<0.0010	-	-	-
HFPO-DA	-	-	-	<0.001	<0.001	<0.001	<0.05	<0.0010	-	-	-
Sum F-53B	-	-	-	<0.001	<0.001	<0.001	<0.1	<0.0020	-	-	-
ADONA	-	-	-	<0.001	<0.001	<0.001	<0.025	<0.0010	-	-	-
P37DMOA	-	-	-	<0.001	<0.001	<0.001	<0.05	-	-	-	-
F-53B major	-	-	-	<0.001	<0.001	<0.001	<0.1	<0.0020	-	-	-

Notes:

1. Results in µg/L.
2. Ministry of Health (MoH, 2022) Water Services (Drinking Water Standards for New Zealand) Regulations 2022, PFOA, and sum of PFOS + PFHxS.
3. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – technical draft guideline values in PFAS National Environmental Management Plan 2.0 – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
4. 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.
5. Summations are made by adding compounds Total PFOS, Total PFHxS together. Where one compound is below detection, it is not included in the summation.
6. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.

-	Parameter not tested / no guideline value available.
0.3	Concentration exceeds 99% ecological guidelines.
1.2	Concentration exceeds 95% ecological guidelines.
3.6	Concentration exceeds drinking water standard.

Table E-2: Surface Water Sampling Results - Per- and Polv-Fluoroalkvl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_ADJ_SW33_1_190218	OHA_ADJ_SW33_2_220518	OHA_ADJ_SW33_3_12918	OHA_ADJ_SW33_4_290920	OHA_ADJ_SW33_5_160321	OHA_ADJ_SW33_6_291021	OHA_ADJ_SW33_7_280322	ANZ WQG for 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	SW33	SW33	SW33	SW33	SW33	SW33	SW33		
Sampled_Date_Time	19/02/2018	22/05/2018	12/09/2018	29/09/2020	16/03/2021	29/10/2021	28/03/2022		
Lab_Report_Number	1047510	1147417	1248198	2094714	2316431	2590572	2785715		
Sample Results									
PFPrS	0.0036	<0.001	0.0034	<0.025	0.002	0.0035	0.0018	-	-
PFBS	0.012	<0.001	0.0077	<0.025	0.0062	0.0072	0.0037	-	-
PFPeS	0.012	<0.001	0.0075	<0.025	0.0058	0.0077	0.004	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
Mono-PFHxS	0.019	<0.001	0.012	<0.025	0.0088	0.012	0.0058	-	-
L-PFHxS	0.11	0.0015	0.067	<0.025	0.049	0.074	0.033	-	-
Total PFHxS [4]	0.13	0.0015	0.079	<0.025	0.058	0.086	0.039	-	-
PFHpS	0.0033	<0.001	0.0017	<0.025	0.0013	0.002	<0.001	-	-
di-PFOS	0.0046	<0.001	0.0025	<0.025	0.0021	0.0028	0.0013	-	-
Mono-PFOS	0.06	<0.001	0.032	<0.025	0.036	0.041	0.019	-	-
L-PFOS	0.047	0.0013	0.024	<0.025	0.052	0.045	0.02	-	-
Total PFOS [4]	**0.11**	0.0013	**0.058**	<0.025	**0.09**	**0.089**	**0.04**	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.24	0.0028	0.14	<0.025	0.15	0.18	0.079	-	-
PFECHS	-	-	-	-	<0.001	<0.001	<0.001	-	-
PFBA	0.087	-	0.044	<0.2	0.043	0.061	0.025	-	-
PFPeA	0.4	0.0037	0.16	<0.1	0.17	0.27	0.085	-	-
PFHxA	0.29	0.0033	0.13	<0.025	0.13	0.18	0.061	-	-
PFHpA	0.11	0.0013	0.049	<0.025	0.054	0.074	0.024	-	-
PFOA	0.051	<0.001	0.021	<0.025	0.021	0.027	0.01	220	19
PFNA	0.018	<0.001	0.0055	<0.025	0.0092	0.0091	0.0033	-	-
PFDA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
PFTrDA	-	<0.005	-	<0.1	-	<0.001	<0.001	-	-
PFTeDA	-	<0.025	-	<0.1	-	<0.001	<0.001	-	-
PFDoDA	-	<0.005	-	<0.1	<0.001	<0.001	<0.001	-	-
FOSA	<0.001	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
MeFOSA	-	<0.001	<0.005	<0.1	<0.001	<0.001	<0.001	-	-
MeFOSAA	<0.005	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
EtFOSAA	<0.005	<0.001	<0.001	<0.025	<0.001	<0.001	<0.001	-	-
4:2 FTS	<0.005	<0.001	-	<0.025	<0.001	-	-	-	-
6:2 FTS	0.0051	0.0016	0.017	<0.05	<0.001	0.0051	0.0022	-	-
8:2 FTS	<0.005	<0.001	<0.001	<0.1	<0.001	<0.001	<0.001	-	-
10:2 FTS	-	-	-	-	<0.001	<0.001	<0.001	-	-
FPrPA	-	-	-	-	<0.001	<0.001	<0.001	-	-
EtFOSA	-	<0.001	<0.005	<0.1	<0.001	<0.001	<0.001	-	-
EtFOSE	<0.025	<0.005	<0.005	<0.1	<0.001	<0.001	<0.001	-	-
FPePA	-	-	-	-	<0.001	<0.001	<0.001	-	-
FHpPA	-	-	-	-	<0.001	<0.001	<0.001	-	-
F-53B minor	-	-	-	-	<0.001	<0.001	<0.001	-	-
HFPO-DA	-	-	-	-	<0.001	<0.001	<0.001	-	-
Sum F-53B	-	-	-	-	<0.001	<0.001	<0.001	-	-
ADONA	-	-	-	-	<0.001	<0.001	<0.001	-	-
P37DMOA	-	-	-	-	<0.001	<0.001	<0.001	-	-
F-53B major	-	-	-	-	<0.001	<0.001	<0.001	-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Polv-Fluoroalkvl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_ADJ_SW33_8_280922	OHA_SW33_050423	OHA_SW33_081123	OHA_ADJ_SW36_1_220218	OHA_ADJ_SW36_2_170518	OHA_ADJ_SW36_3_120918	OHA_ADJ_SW36_4_290920	ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	OHA_ADJ_SW33	OHA_ADJ_SW33	SW33	SW36	SW36	SW36	SW36		
Sampled_Date_Time	28/09/2022	5/04/2023	8/11/2023	22/02/2018	17/05/2018	12/09/2018	29/09/2020		
Lab_Report_Number	3019751	3283482	3519861	1047802	1142104	1251329	2094717		
Sample Results									
PFPrS	0.0022	0.0017	0.0017	<0.001	<0.001	<0.001	<0.025	-	-
PFBS	0.0051	0.0051	0.0059	<0.001	<0.001	<0.001	<0.025	-	-
PFPeS	0.0052	0.0048	0.0058	<0.001	<0.001	<0.001	<0.025	-	-
di-PFHxS	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.025	-	-
Mono-PFHxS	0.008	0.0076	0.010	<0.001	<0.001	<0.001	<0.025	-	-
L-PFHxS	0.044	0.049	0.056	<0.001	<0.001	<0.001	<0.025	-	-
Total PFHxS [4]	0.052	0.057	0.066	<0.001	<0.001	<0.001	<0.025	-	-
PFHpS	0.0012	0.0018	0.0022	<0.001	<0.001	<0.001	<0.025	-	-
di-PFOS	0.0016	0.0022	0.0025	<0.001	<0.001	<0.001	<0.025	-	-
Mono-PFOS	0.029	0.037	0.040	<0.001	<0.001	<0.001	<0.025	-	-
L-PFOS	0.017	0.06	0.066	<0.001	<0.001	<0.001	<0.025	-	-
Total PFOS[4]	**0.048**	**0.099**	**0.11**	<0.001	<0.001	<0.001	<0.025	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.1	0.16	0.18	<0.001	<0.001	<0.001	<0.025	-	-
PFECHS	<0.001	<0.001	<0.0010	-	-	-	-	-	-
PFBA	0.034	0.037	-	<0.005	<0.01	<0.005	<0.2	-	-
PFPeA	0.13	0.16	0.15	<0.001	<0.001	<0.001	<0.1	-	-
PFHxA	0.091	0.11	0.11	<0.001	<0.001	<0.001	<0.025	-	-
PFHpA	0.037	0.043	0.047	<0.001	<0.001	<0.001	<0.025	-	-
PFOA	0.015	0.023	0.022	<0.001	<0.001	<0.001	<0.025	220	19
PFNA	0.0044	0.0087	0.0086	<0.001	<0.001	<0.001	<0.025	-	-
PFDA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.025	-	-
PFUnDA	<0.001	<0.001	-	<0.001	<0.001	<0.005	<0.025	-	-
PFTrDA	-	-	-	-	<0.025	<0.005	<0.1	-	-
PFTeDA	-	<0.001	-	-	<0.1	-	<0.1	-	-
PFDoDA	<0.001	<0.001	-	-	<0.025	<0.005	<0.1	-	-
FOSA	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.025	-	-
MeFOSA	<0.001	<0.001	<0.0010	-	<0.005	<0.005	<0.1	-	-
MeFOSAA	<0.001	<0.001	-	<0.005	<0.001	<0.005	<0.025	-	-
EtFOSAA	<0.001	<0.001	-	<0.005	<0.001	<0.005	<0.025	-	-
4:2 FTS	-	<0.001	<0.0010	<0.005	<0.001	<0.001	<0.025	-	-
6:2 FTS	0.0034	<0.001	0.0024	<0.005	<0.001	<0.001	<0.05	-	-
8:2 FTS	<0.001	<0.001	<0.0010	<0.005	<0.001	<0.005	<0.1	-	-
10:2 FTS	<0.001	<0.001	-	-	-	-	-	-	-
FPrPA	<0.001	<0.001	<0.0010	-	-	-	-	-	-
EtFOSA	<0.001	<0.001	<0.0010	-	<0.001	<0.005	<0.1	-	-
EtFOSE	<0.001	<0.001	<0.0010	-	<0.005	<0.005	<0.1	-	-
FPePA	<0.001	<0.001	<0.0010	-	-	-	-	-	-
FHpPA	<0.001	<0.001	-	-	-	-	-	-	-
F-53B minor	<0.001	<0.001	-	-	-	-	-	-	-
HFPO-DA	<0.001	<0.001	<0.0010	-	-	-	-	-	-
Sum F-53B	<0.001	<0.001	<0.0010	-	-	-	-	-	-
ADONA	<0.001	<0.001	<0.0010	-	-	-	-	-	-
P37DMOA	<0.001	<0.001	-	-	-	-	-	-	-
F-53B major	<0.001	<0.001	<0.0010	-	-	-	-	-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_ADJ_SW36_5_160321	OHA_ADJ_SW36_7_291021	OHA_ADJ_SW36_8_280322	OHA_ADJ_SW36_9_290922	OHA_SW36_050423	OHA_SW36_081123	SW6	ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	SW36	SW36	SW36	OHA_ADJ_SW36	OHA_ADJ_SW36	SW36	SW6		
Sampled_Date_Time	16/03/2021	29/10/2021	28/03/2022	29/09/2022	5/04/2023	8/11/2023	4/08/2017		
Lab_Report_Number	2370192	2590570	2785749	3041553	3288819	3519864	841470		
Sample Results									
PFPrS	<0.001	0.0014	<0.001	0.0013	<0.001	<0.0010	0.023	-	-
PFBS	0.0017	0.0026	0.0016	0.0029	0.0027	0.0025	0.079	-	-
PFPeS	0.0019	0.0028	0.0015	0.003	0.0026	0.0025	0.083	-	-
di-PFHxS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.002	-	-
Mono-PFHxS	0.003	0.0039	0.0022	0.0047	0.0043	0.0045	0.3	-	-
L-PFHxS	0.018	0.023	0.012	0.027	0.022	0.025	1.6	-	-
Total PFHxS [4]	0.021	0.027	0.014	0.032	0.026	0.030	1.9	-	-
PFHpS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.066	-	-
di-PFOS	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	0.036	-	-
Mono-PFOS	0.017	0.011	0.0061	0.015	0.01	0.015	0.52	-	-
L-PFOS	0.016	0.0095	0.0058	0.0086	0.0075	0.016	0.86	-	-
Total PFOS[4]	**0.033**	**0.02**	**0.012**	**0.024**	**0.018**	**0.032**	**1.4**	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.054	0.047	0.026	0.056	0.044	0.062	-	-	-
PFECHS	<0.001	<0.001	<0.001	<0.001	-	<0.0010	-	-	-
PFBA	0.019	0.017	0.013	0.017	0.014	-	0.23	-	-
PFPeA	0.072	0.06	0.024	0.051	0.051	0.046	1.1	-	-
PFHxA	0.05	0.039	0.018	0.038	0.036	0.032	1	-	-
PFHpA	0.026	0.018	0.0073	0.018	0.016	0.014	0.32	-	-
PFOA	0.012	0.0079	0.0031	0.0079	0.0064	0.0088	0.61	220	19
PFNA	0.0048	0.0026	0.0011	0.0022	0.0029	0.0032	0.15	-	-
PFDA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0012	-	-
PFUnDA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.005	-	-
PFTrDA	-	<0.001	<0.001	-	-	-	-	-	-
PFTeDA	-	<0.001	<0.001	-	-	-	-	-	-
PFDoDA	<0.001	<0.001	<0.001	-	<0.001	-	<0.005	-	-
FOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	-	-
MeFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	-	-
MeFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.005	-	-
EtFOSAA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.005	-	-
4:2 FTS	<0.001	-	-	-	<0.001	<0.0010	0.0059	-	-
6:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.81	-	-
8:2 FTS	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	-	-
10:2 FTS	<0.001	<0.001	<0.001	-	<0.001	-	-	-	-
FPrPA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
EtFOSA	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.005	-	-
EtFOSE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.005	-	-
FPePA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
FHpPA	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-
F-53B minor	<0.001	<0.001	<0.001	-	<0.001	-	-	-	-
HFPO-DA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
Sum F-53B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
ADONA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	-	-	-
P37DMOA	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-
F-53B major	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010		-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	SW6	SW6	OHA_DPB_SW6_4_290920	OHA_DPB_SW6_6_291021	OHA_DPB_SW6_7_280322	OHA_DPB_SW6_8_280922	OHA_SW6_030423	ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	SW6	SW6	SW6	SW6	SW6	OHA_DPB_SW6	OHA_DPB_SW6		
Sampled_Date_Time	1/11/2017	3/07/2018	29/09/2020	29/10/2021	28/03/2022	28/09/2022	3/04/2023		
Lab_Report_Number	937355	1186578	2094713	2590926	2785776	3008365	3276244		
Sample Results									
PFPrS	0.042	0.013	<0.025	<0.025	0.029	0.026	<0.025	-	-
PFBS	0.12	0.037	<0.025	0.053	0.063	0.089	0.03	-	-
PFPeS	0.18	0.045	<0.025	0.057	0.092	0.12	0.034	-	-
di-PFHxS	0.0039	<0.001	<0.025	<0.025	0.0021	<0.025	<0.025	-	-
Mono-PFHxS	0.28	0.073	0.03	0.11	0.16	0.23	0.053	-	-
L-PFHxS	1.8	0.48	0.19	0.86	0.95	1.4	0.42	-	-
Total PFHxS [4]	2.1	0.55	0.22	0.97	1.1	1.6	0.47	-	-
PFHpS	0.13	0.027	<0.025	0.046	0.05	0.061	<0.025	-	-
di-PFOS	0.096	0.013	<0.025	0.039	0.051	0.059	<0.025	-	-
Mono-PFOS	0.82	0.15	0.093	0.58	0.64	0.89	0.38	-	-
L-PFOS	1	0.21	0.13	0.83	0.69	0.82	0.52	-	-
Total PFOS[4]	**1.9**	**0.37**	**0.22**	**1.4**	**1.4**	**1.8**	**0.9**	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	-	0.92	0.44	2.4	2.5	3.4	1.4	-	-
PFECHS	-	-	-	<0.025	<0.001	<0.025	<0.025	-	-
PFBA	0.32	0.11	<0.2	0.16	0.22	0.24	<0.1	-	-
PFPeA	1.5	0.44	0.22	0.62	0.86	0.9	0.34	-	-
PFHxA	0.96	0.32	0.14	0.39	0.62	0.68	0.24	-	-
PFHpA	0.47	0.16	0.073	0.23	0.31	0.38	0.15	-	-
PFOA	0.73	0.19	0.065	0.34	0.36	0.51	0.17	220	19
PFNA	0.32	0.092	0.029	0.18	0.17	0.22	0.12	-	-
PFDA	0.002	0.0011	<0.025	<0.025	0.0014	<0.025	<0.025	-	-
PFUnDA	0.0012	<0.001	<0.025	<0.025	0.0011	<0.025	<0.025	-	-
PFTrDA	-	<0.025	<0.1	<0.1	<0.001	<0.1	<0.1	-	-
PFTeDA	-	<0.1	<0.1	<0.1	<0.001	<0.1	<0.1	-	-
PFDoDA	<0.001	<0.025	<0.1	<0.1	<0.001	<0.1	<0.1	-	-
FOSA	0.0012	<0.001	<0.025	<0.025	<0.001	<0.025	<0.025	-	-
MeFOSA	<0.005	<0.005	<0.1	<0.1	<0.001	<0.1	<0.1	-	-
MeFOSAA	<0.005	<0.001	<0.025	<0.025	<0.001	<0.025	<0.025	-	-
EtFOSAA	<0.005	<0.001	<0.025	<0.025	<0.001	<0.025	<0.025	-	-
4:2 FTS	0.0053	<0.001	<0.025	<0.025	-	<0.025	<0.025	-	-
6:2 FTS	1.5	0.33	0.053	0.62	0.44	0.7	0.14	-	-
8:2 FTS	0.0054	<0.001	<0.1	<0.1	<0.001	<0.1	<0.1	-	-
10:2 FTS	-	-	-	<0.025	<0.001	<0.025	<0.025	-	-
FPrPA	-	-	-	<0.1	0.0022	<0.1	<0.1	-	-
EtFOSA	<0.005	<0.005	<0.1	<0.1	<0.001	<0.1	<0.1	-	-
EtFOSE	<0.005	<0.005	<0.1	<0.1	<0.001	<0.1	<0.1	-	-
FPePA	-	-	-	<0.025	0.005	<0.025	<0.025	-	-
FHpPA	-	-	-	<0.025	<0.001	<0.025	<0.025	-	-
F-53B minor	-	-	-	<0.05	<0.001	<0.05	<0.05	-	-
HFPO-DA	-	-	-	<0.05	<0.001	<0.05	<0.05	-	-
Sum F-53B	-	-	-	<0.1	<0.001	<0.1	<0.1	-	-
ADONA	-	-	-	<0.025	<0.001	<0.025	<0.025	-	-
P37DMOA	-	-	-	<0.05	<0.001	<0.05	<0.05	-	-
F-53B major	-		<0.001	<0.1	<0.1	<0.1	<0.1	-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Poly-Fluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_SW6_071123	SW4	OHA_SHW_SW4_2_021020	OHA_SHW_SW4_3_180321	OHA_SHW_SW4_4_271021	OHA_SHW_SW4_5_300322	OHA_SHW_SW4_6_280922	ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	SW6	SW4	SW4	SW4	SW4	SW4	OHA_SHW_SW4		
Sampled_Date_Time	7/11/2023	4/08/2017	2/10/2020	18/03/2021	27/10/2021	30/03/2022	28/09/2022		
Lab_Report_Number	3518234	841470	2094371	2327926	2576268	2786753	3009070		
Sample Results									
PFPrS	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
PFBS	0.069	<0.001	<0.001	0.0012	<0.001	<0.001	<0.001	-	-
PFPeS	0.077	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
di-PFHxS	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
Mono-PFHxS	0.16	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
L-PFHxS	0.92	<0.001	<0.001	0.005	<0.001	<0.001	<0.001	-	-
Total PFHxS [4]	1.1	<0.001	<0.001	0.005	<0.001	<0.001	<0.001	-	-
PFHpS	0.041	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
di-PFOS	0.027	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
Mono-PFOS	0.50	<0.001	<0.001	0.0029	<0.001	<0.001	<0.001	-	-
L-PFOS	0.69	<0.001	<0.001	0.0036	<0.001	<0.001	<0.001	-	-
Total PFOS[4]	**1.2**	<0.001	<0.001	0.0065	<0.001	<0.001	<0.001	0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	2.3	-	<0.001	0.012	<0.001	<0.001	<0.001	-	-
PFECHS	<0.025	-	-	<0.001	<0.001	<0.001	<0.001	-	-
PFBA	0.24	0.0054	0.0095	0.037	0.0085	0.0061	0.008	-	-
PFPeA	0.78	<0.001	<0.001	0.096	0.0035	0.0013	0.0018	-	-
PFHxA	0.57	<0.001	0.001	0.079	0.0016	<0.001	<0.001	-	-
PFHpA	0.28	<0.001	<0.001	0.048	0.0011	<0.001	<0.001	-	-
PFOA	0.34	<0.001	<0.001	0.013	<0.001	<0.001	<0.001	220	19
PFNA	0.14	<0.001	<0.001	0.0039	<0.001	<0.001	<0.001	-	-
PFDA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
PFUnDA	<0.025	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
PFTrDA	<0.10	-	<0.001	<0.005	-	<0.001	-	-	-
PFTeDA	<0.10	-	<0.001	-	-	<0.001	-	-	-
PFDoDA	<0.10	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001	-	-
FOSA	<0.025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
MeFOSA	<0.10	-	-	<0.005	<0.001	<0.001	<0.001	-	-
MeFOSAA	<0.025	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
EtFOSAA	<0.025	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
4:2 FTS	<0.025	<0.005	-	<0.001	-	-	-	-	-
6:2 FTS	0.35	<0.005	<0.001	0.0096	-	<0.001	<0.001	-	-
8:2 FTS	<0.10	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	-
10:2 FTS	<0.025	-	-	<0.001	<0.001	<0.001	<0.001	-	-
FPrPA	<0.10	-	-	<0.001	<0.001	<0.001	<0.001	-	-
EtFOSA	<0.10	-	-	<0.005	<0.001	<0.001	<0.001	-	-
EtFOSE	<0.10	<0.005	-	<0.005	<0.001	<0.001	<0.001	-	-
FPePA	<0.025	-	-	<0.001	<0.001	<0.001	<0.001	-	-
FHpPA	<0.025	-	-	<0.001	<0.001	<0.001	<0.001	-	-
F-53B minor	<0.050	-	-	<0.001	<0.001	<0.001	<0.001	-	-
HFPO-DA	<0.050	-	-	<0.001	<0.001	<0.001	<0.001	-	-
Sum F-53B	<0.10	-	-	<0.001	<0.001	<0.001	<0.001	-	-
ADONA	<0.025	-	-	<0.001	<0.001	<0.001	<0.001	-	-
P37DMOA	<0.050	-	-	<0.001	<0.001	<0.001	<0.001	-	-
F-53B major	<0.10	-	-	-	<0.001	<0.001	<0.001	-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.

Table E-2: Surface Water Sampling Results - Per- and Polyfluoroalkyl Substances (PFAS) [1]

	PFAS Samples in Surface Water							Guidelines	
Field_ID	OHA_SW4_050423	OHA_SW4_081123						ANZECC 95% Species Protection - Technical Draft Default Guideline Values [2]	ANZ WQG for 99% Species Protection - Technical Draft Default Guideline Values [2]
Location_Code	OHA_SHW_SW4	SW4							
Sampled_Date_Time	5/04/2023	8/11/2023							
Lab_Report_Number	3283471	3519870							
Sample Results									
PFPrS	<0.001	<0.0010						-	-
PFBS	<0.001	<0.0010						-	-
PFPeS	<0.001	<0.0010						-	-
di-PFHxS	<0.001	<0.0010						-	-
Mono-PFHxS	<0.001	<0.0010						-	-
L-PFHxS	0.0017	<0.0010						-	-
Total PFHxS [4]	0.0017	<0.0010						-	-
PFHpS	<0.001	<0.0010						-	-
di-PFOS	<0.001	<0.0010						-	-
Mono-PFOS	0.0015	<0.0010						-	-
L-PFOS	0.0024	<0.0010						-	-
Total PFOS [4]	0.0039	<0.0010						0.48 [3]	0.0091 [3]
Sum of PFHxS and PFOS [5]	0.0056	<0.0010						-	-
PFECHS	<0.001	<0.0010						-	-
PFBA	0.0091	-						-	-
PFPeA	0.014	<0.0010						-	-
PFHxA	0.0096	<0.0010						-	-
PFHpA	0.0054	<0.0010						-	-
PFOA	0.0022	<0.0010						220	19
PFNA	0.0014	<0.0010						-	-
PFDA	<0.001	<0.0010						-	-
PFUnDA	<0.001	-						-	-
PFTrDA	-	-						-	-
PFTeDA	-	-						-	-
PFDoDA	-	-						-	-
FOSA	<0.001	<0.0010						-	-
MeFOSA	<0.001	<0.0010						-	-
MeFOSAA	<0.001	-						-	-
EtFOSAA	<0.001	-						-	-
4:2 FTS	-	<0.0010						-	-
6:2 FTS	<0.001	<0.0010						-	-
8:2 FTS	<0.001	<0.0010						-	-
10:2 FTS	-	-						-	-
FPrPA	<0.001	<0.0010						-	-
EtFOSA	<0.001	<0.0010						-	-
EtFOSE	<0.001	<0.0010						-	-
FPePA	<0.001	<0.0010						-	-
FHpPA	<0.001	-						-	-
F-53B minor	-	-						-	-
HFPO-DA	<0.001	<0.0010						-	-
Sum F-53B	<0.001	<0.0010						-	-
ADONA	<0.001	<0.0010						-	-
P37DMOA	<0.001	-						-	-
F-53B major	<0.001	<0.0010						-	-

Notes:

1. Results in µg/L.
2. Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZ WQG) – technical draft guideline values in PFAS National Environmental Management Plan – Table 5. The Heads of EPAs Australia and New Zealand (HEPA), January 2020.
3. ANZG 2023, Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. CC BY 4.0. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia.
4. 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.
5. 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.
3.6	Concentration exceeds 99% ecological guidelines.