Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 374808

Client Details

Client	NSW Health
Attention	Kwendy Cavanagh
Address	Locked Bag 2030, ST LEONARDS, NSW, 1590

Sample Details

Your Reference	**Narrabri Shire Council - Namoi Reservoir**
Number of Samples	3 Water
Date samples received	06/03/2025
Date completed instructions received	06/03/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	07/03/2025
Date of Issue	12/03/2025
Reissue Details	This report replaces R00 created on 07/03/2025 due to: Sample ID Amended (Client Request)

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Amanda Chui, LC/Air Toxics Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

PFAS in Water LOW LEVEL Short		
Our Reference		374808-1
Your Reference	UNITS	Namoi Reservoir A25NA0100016
Barcode		A25NA0100016
Sample Site Code		N27
Date Sampled		24/02/2025
Type of sample		Water
Date prepared	-	07/03/2025
Date analysed	-	07/03/2025
Perfluorobutanesulfonic acid	µg/L	<0.001
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.005
Perfluorooctanesulfonic acid PFOS	µg/L	0.008
Perfluorooctanoic acid PFOA	µg/L	<0.001
6:2 FTS	µg/L	<0.001
8:2 FTS	µg/L	<0.002
Surrogate $^{13}C_8$ *PFOS*	%	103
Surrogate $^{13}C_2$ *PFOA*	%	99
Extracted ISTD $^{13}C_3$ *PFBS*	%	105
Extracted ISTD $^{18}O_2$ *PFHxS*	%	123
Extracted ISTD $^{13}C_4$ *PFOS*	%	121
Extracted ISTD $^{13}C_4$ *PFOA*	%	138
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	166
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	186
Total Positive PFHxS & PFOS	µg/L	0.013
Total Positive PFOA & PFOS	µg/L	0.008
Total Positive PFAS	µg/L	0.013

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: PFAS in Water LOW LEVEL Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			07/03/2025	1	07/03/2025	07/03/2025		07/03/2025	[NT]
Date analysed	-			07/03/2025	1	07/03/2025	07/03/2025		07/03/2025	[NT]
Perfluorobutanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	108	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.001	Org-029	<0.001	1	0.005	0.005	0	109	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	Org-029	<0.001	1	0.008	0.007	13	104	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	100	[NT]
6:2 FTS	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	100	[NT]
8:2 FTS	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	97	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	101	1	103	102	1	104	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	108	1	99	108	9	107	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	104	1	105	106	1	96	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	119	1	123	124	1	109	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	123	1	121	127	5	115	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	124	1	138	133	4	126	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	155	1	166	167	1	146	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	178	1	186	#		174	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 374811

Client Details

Client	NSW Health
Attention	Kwendy Cavanagh
Address	Locked Bag 2030, ST LEONARDS, NSW, 1590

Sample Details

Your Reference	**Narrabri Shire Council - Elizabeth Bore**
Number of Samples	3 Water
Date samples received	06/03/2025
Date completed instructions received	06/03/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	07/03/2025
Date of Issue	12/03/2025
Reissue Details	This report replaces R00 created on 07/03/2025 due to: Sample ID Amended (Client Request)

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Amanda Chui, LC/Air Toxics Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

PFAS in Water LOW LEVEL Short				
Our Reference		374811-1	374811-2	374811-3
Your Reference	UNITS	Elizabeth Bore A25NA0100015	Elizabeth Bore Duplicate	Elizabeth Bore Field Blank
Barcode		A25NA0100015	-	-
Sample Site Code		N30	N30	N30
Date Sampled		5/03/2025	5/03/2025	5/03/2025
Type of sample		Water	Water	Water
Date prepared	-	07/03/2025	07/03/2025	07/03/2025
Date analysed	-	07/03/2025	07/03/2025	07/03/2025
Perfluorobutanesulfonic acid	µg/L	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.001	<0.001	<0.001
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	0.001	<0.001
Perfluorooctanoic acid PFOA	µg/L	<0.001	<0.001	<0.001
6:2 FTS	µg/L	<0.001	<0.001	<0.001
8:2 FTS	µg/L	<0.002	<0.002	<0.002
Surrogate $^{13}C_8$ *PFOS*	%	102	102	103
Surrogate $^{13}C_2$ *PFOA*	%	110	107	107
Extracted ISTD $^{13}C_3$ *PFBS*	%	109	108	108
Extracted ISTD $^{18}O_2$ *PFHxS*	%	124	127	125
Extracted ISTD $^{13}C_4$ *PFOS*	%	122	121	123
Extracted ISTD $^{13}C_4$ *PFOA*	%	129	128	128
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	184	170	164
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	#	195	#
Total Positive PFHxS & PFOS	µg/L	0.001	0.001	<0.001
Total Positive PFOA & PFOS	µg/L	0.001	0.001	<0.001
Total Positive PFAS	µg/L	0.001	0.001	<0.001

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: PFAS in Water LOW LEVEL Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			07/03/2025	[NT]	[NT]	[NT]	[NT]	07/03/2025	[NT]
Date analysed	-			07/03/2025	[NT]	[NT]	[NT]	[NT]	07/03/2025	[NT]
Perfluorobutanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
6:2 FTS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
8:2 FTS	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	119	[NT]	[NT]	[NT]	[NT]	109	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	123	[NT]	[NT]	[NT]	[NT]	115	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	124	[NT]	[NT]	[NT]	[NT]	126	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	155	[NT]	[NT]	[NT]	[NT]	146	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	178	[NT]	[NT]	[NT]	[NT]	174	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 374809

Client Details

Client	NSW Health
Attention	Kwendy Cavanagh
Address	Locked Bag 2030, ST LEONARDS, NSW, 1590

Sample Details

Your Reference	**Narrabri Shire Council - Killarney Bore**
Number of Samples	3 Water
Date samples received	06/03/2025
Date completed instructions received	06/03/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	07/03/2025
Date of Issue	12/03/2025
Reissue Details	This report replaces R00 created on 07/03/2025 due to: Sample ID Amended (Client Request)

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Amanda Chui, LC/Air Toxics Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

PFAS in Water LOW LEVEL Short		
Our Reference		374809-1
Your Reference	UNITS	Killarney Bore A25NA0100013
Barcode		A25NA0100013
Sample Site Code		N29
Date Sampled		24/02/2025
Type of sample		Water
Date prepared	-	07/03/2025
Date analysed	-	07/03/2025
Perfluorobutanesulfonic acid	µg/L	0.006
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.032
Perfluorooctanesulfonic acid PFOS	µg/L	0.036
Perfluorooctanoic acid PFOA	µg/L	0.002
6:2 FTS	µg/L	<0.001
8:2 FTS	µg/L	<0.002
Surrogate $^{13}C_8$ *PFOS*	%	103
Surrogate $^{13}C_2$ *PFOA*	%	105
Extracted ISTD $^{13}C_3$ *PFBS*	%	104
Extracted ISTD $^{18}O_2$ *PFHxS*	%	127
Extracted ISTD $^{13}C_4$ *PFOS*	%	121
Extracted ISTD $^{13}C_4$ *PFOA*	%	139
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	190
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	191
Total Positive PFHxS & PFOS	µg/L	0.068
Total Positive PFOA & PFOS	µg/L	0.038
Total Positive PFAS	µg/L	0.077

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: PFAS in Water LOW LEVEL Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	374809-1
Date prepared	-			07/03/2025	[NT]	[NT]	[NT]	[NT]	07/03/2025	07/03/2025
Date analysed	-			07/03/2025	[NT]	[NT]	[NT]	[NT]	07/03/2025	07/03/2025
Perfluorobutanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	108	103
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	109	96
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	104	93
Perfluorooctanoic acid PFOA	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	99
6:2 FTS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	108
8:2 FTS	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	97	92
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	104	100
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	107	112
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	96	105
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	119	[NT]	[NT]	[NT]	[NT]	109	133
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	123	[NT]	[NT]	[NT]	[NT]	115	128
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	124	[NT]	[NT]	[NT]	[NT]	126	136
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	155	[NT]	[NT]	[NT]	[NT]	146	181
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	178	[NT]	[NT]	[NT]	[NT]	174	#

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 374810

Client Details

Client	NSW Health
Attention	Kwendy Cavanagh
Address	Locked Bag 2030, ST LEONARDS, NSW, 1590

Sample Details

Your Reference	**Narrabri Shire Council - Tibberena Bore**
Number of Samples	3 Water
Date samples received	06/03/2025
Date completed instructions received	06/03/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	07/03/2025
Date of Issue	12/03/2025
Reissue Details	This report replaces R00 created on 07/03/2025 due to: Sample ID Amended (Client Request)

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Amanda Chui, LC/Air Toxics Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

PFAS in Water LOW LEVEL Short		
Our Reference		374810-1
Your Reference	UNITS	Tibberena Bore A25NA0100014
Barcode		A25NA0100014
Sample Site Code		N28
Date Sampled		5/03/2025
Type of sample		Water
Date prepared	-	07/03/2025
Date analysed	-	07/03/2025
Perfluorobutanesulfonic acid	µg/L	0.001
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.006
Perfluorooctanesulfonic acid PFOS	µg/L	0.011
Perfluorooctanoic acid PFOA	µg/L	<0.001
6:2 FTS	µg/L	<0.001
8:2 FTS	µg/L	<0.002
Surrogate $^{13}C_8$ *PFOS*	%	105
Surrogate $^{13}C_2$ *PFOA*	%	115
Extracted ISTD $^{13}C_3$ *PFBS*	%	101
Extracted ISTD $^{18}O_2$ *PFHxS*	%	128
Extracted ISTD $^{13}C_4$ *PFOS*	%	118
Extracted ISTD $^{13}C_4$ *PFOA*	%	127
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	174
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	181
Total Positive PFHxS & PFOS	µg/L	0.017
Total Positive PFOA & PFOS	µg/L	0.011
Total Positive PFAS	µg/L	0.018

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: PFAS in Water LOW LEVEL Short					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			07/03/2025	[NT]	[NT]	[NT]	[NT]	07/03/2025	[NT]
Date analysed	-			07/03/2025	[NT]	[NT]	[NT]	[NT]	07/03/2025	[NT]
Perfluorobutanesulfonic acid	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
6:2 FTS	µg/L	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
8:2 FTS	µg/L	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	108	[NT]	[NT]	[NT]	[NT]	107	[NT]
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	119	[NT]	[NT]	[NT]	[NT]	109	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	123	[NT]	[NT]	[NT]	[NT]	115	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	124	[NT]	[NT]	[NT]	[NT]	126	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	151	[NT]	[NT]	[NT]	[NT]	146	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	178	[NT]	[NT]	[NT]	[NT]	174	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).