# CERTIFICATE OF ANALYSIS 384697

## Client Details

| | |
|---|---|
| **Client** | NSW Health |
| **Attention** | Fernan Reyes |
| **Address** | Locked Bag 2030, ST LEONARDS, NSW, 1590 |

## Sample Details

| | |
|---|---|
| **Your Reference** | **Narrabri Shire - Namoi Reservoir N27** |
| **Number of Samples** | 3 Water |
| **Date samples received** | 01/07/2025 |
| **Date completed instructions received** | 01/07/2025 |

## 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

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| **Date results requested by** | 02/07/2025 |
| **Date of Issue** | 02/07/2025 |

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**Results Approved By**
Sean McAlary, Senior Chemist

**Authorised By**
Nancy Zhang, Laboratory Manager

| PFAS in Water LOW LEVEL Short | | |
|---|---|---|
| Our Reference | | 384697-1 |
| Your Reference | UNITS | Namoi Reservoir A25NA0100041 |
| Barcode | | A25NA0100041 |
| Sample Site Code | | N27 |
| Date Sampled | | 30/06/2025 |
| Type of sample | | Water |
| Date prepared | - | 02/07/2025 |
| Date analysed | - | 02/07/2025 |
| Perfluorobutanesulfonic acid | µg/L | <0.001 |
| Perfluorohexanesulfonic acid - PFHxS | µg/L | 0.006 |
| Perfluorooctanesulfonic acid PFOS | µg/L | 0.009 |
| 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* | % | 96 |
| *Surrogate* $^{13}C_2$ *PFOA* | % | 109 |
| *Extracted ISTD* $^{13}C_3$ *PFBS* | % | 89 |
| *Extracted ISTD* $^{18}O_2$ *PFHxS* | % | 88 |
| *Extracted ISTD* $^{13}C_4$ *PFOS* | % | 86 |
| *Extracted ISTD* $^{13}C_4$ *PFOA* | % | 82 |
| *Extracted ISTD* $^{13}C_2$ *6:2FTS* | % | 88 |
| *Extracted ISTD* $^{13}C_2$ *8:2FTS* | % | 81 |
| Total Positive PFHxS & PFOS | µg/L | 0.015 |
| Total Positive PFOA & PFOS | µg/L | 0.009 |
| Total Positive PFAS | µg/L | 0.015 |

| 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 | - | | | 02/07/2025 | [NT] | [NT] | [NT] | [NT] | 02/07/2025 | [NT] |
| Date analysed | - | | | 02/07/2025 | [NT] | [NT] | [NT] | [NT] | 02/07/2025 | [NT] |
| Perfluorobutanesulfonic acid | µg/L | 0.001 | Org-029 | <0.001 | [NT] | [NT] | [NT] | [NT] | 95 | [NT] |
| Perfluorohexanesulfonic acid - PFHxS | µg/L | 0.001 | Org-029 | <0.001 | [NT] | [NT] | [NT] | [NT] | 111 | [NT] |
| Perfluorooctanesulfonic acid PFOS | µg/L | 0.001 | Org-029 | <0.001 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Perfluorooctanoic acid PFOA | µg/L | 0.001 | Org-029 | <0.001 | [NT] | [NT] | [NT] | [NT] | 96 | [NT] |
| 6:2 FTS | µg/L | 0.001 | Org-029 | <0.001 | [NT] | [NT] | [NT] | [NT] | 109 | [NT] |
| 8:2 FTS | µg/L | 0.002 | Org-029 | <0.002 | [NT] | [NT] | [NT] | [NT] | 102 | [NT] |
| Surrogate $^{13}C_8$ PFOS | % | | Org-029 | 103 | [NT] | [NT] | [NT] | [NT] | 99 | [NT] |
| Surrogate $^{13}C_2$ PFOA | % | | Org-029 | 103 | [NT] | [NT] | [NT] | [NT] | 97 | [NT] |
| Extracted ISTD $^{13}C_3$ PFBS | % | | Org-029 | 85 | [NT] | [NT] | [NT] | [NT] | 54 | [NT] |
| Extracted ISTD $^{18}O_2$ PFHxS | % | | Org-029 | 83 | [NT] | [NT] | [NT] | [NT] | 49 | [NT] |
| Extracted ISTD $^{13}C_4$ PFOS | % | | Org-029 | 80 | [NT] | [NT] | [NT] | [NT] | 52 | [NT] |
| Extracted ISTD $^{13}C_4$ PFOA | % | | Org-029 | 86 | [NT] | [NT] | [NT] | [NT] | 54 | [NT] |
| Extracted ISTD $^{13}C_2$ 6:2FTS | % | | Org-029 | 85 | [NT] | [NT] | [NT] | [NT] | 51 | [NT] |
| Extracted ISTD $^{13}C_2$ 8:2FTS | % | | Org-029 | 88 | [NT] | [NT] | [NT] | [NT] | 52 | [NT] |

## Result Definitions

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|---|---|
| **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. |

## 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.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

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.

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.

For Dust Deposit Gauge (DDG) analysis the sampling, sampling period and funnel exposure area do not fall under Envirolab's NATA accreditation (unless the Newcastle laboratory where responsible for the sampling), hence the annotation on the DDG units of reporting.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

## 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).