



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 242696**

### **Client Details**

<b>Client</b>	Vital Chemical Pty Ltd
<b>Attention</b>	Letiscia Xavier
<b>Address</b>	Suite 1, Level 1, 225 Brisbane Terrace, Goodna, QLD, 4300

### **Sample Details**

<b>Your Reference</b>	<b><u>Vital Chemical - Vital Bon-matt PFAS Analysis</u></b>
<b>Number of Samples</b>	4 Liquid
<b>Date samples received</b>	12/05/2020
<b>Date completed instructions received</b>	12/05/2020

### **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**

<b>Date results requested by</b>	01/06/2020
<b>Date of Issue</b>	18/05/2020

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#### **Results Approved By**

Fiona Tan, LC Supervisor

#### **Authorised By**

Nancy Zhang, Laboratory Manager

**Client Reference: Vital Chemical - Vital Bon-matt PFAS Analysis**

<b>PFAS in Waters Short</b>					
Our Reference		242696-1	242696-2	242696-3	242696-4
Your Reference	UNITS	Vital Bon-Matt P47-VR1 (IGD)	Vital Bon-Matt Stonewall (Natural)	Vital Bon-Matt Stonewall (IGD)	Vital Bon-Matt HR
Date Sampled		06/03/2020	06/03/2020	06/03/2020	06/03/2020
Type of sample		Liquid	Liquid	Liquid	Liquid
Date prepared	-	13/05/2020	13/05/2020	13/05/2020	13/05/2020
Date analysed	-	14/05/2020	14/05/2020	14/05/2020	14/05/2020
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<10	<10	<10	<10
Perfluorooctanesulfonic acid PFOS	µg/kg	<10	<10	<10	<10
Perfluorooctanoic acid PFOA	µg/kg	<10	<10	<10	<10
6:2 FTS	µg/kg	<10	<10	<10	<10
8:2 FTS	µg/kg	<20	<20	<20	<20
Surrogate <sup>13</sup> C <sub>8</sub> PFOS	%	104	98	103	105
Surrogate <sup>13</sup> C <sub>2</sub> PFOA	%	94	98	93	95
Extracted ISTD <sup>18</sup> O <sub>2</sub> PFHxS	%	107	111	115	114
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOS	%	98	104	105	106
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOA	%	119	125	128	129
Extracted ISTD <sup>13</sup> C <sub>2</sub> 6:2FTS	%	160	166	187	#
Extracted ISTD <sup>13</sup> C <sub>2</sub> 8:2FTS	%	129	141	125	114
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01	<0.01	<0.01

## Client Reference: Vital Chemical - Vital Bon-matt PFAS Analysis

Method ID	Methodology Summary
<b>Org-029</b>	<p>Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS.</p> <p>PFAS results include the sum of branched and linear isomers where applicable.</p> <p>Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.3 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.</p> <p>Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.</p>

Client Reference: Vital Chemical - Vital Bon-matt PFAS Analysis

QUALITY CONTROL: PFAS in Waters Short					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			13/05/2020	1	13/05/2020	13/05/2020		13/05/2020	[NT]
Date analysed	-			14/05/2020	1	14/05/2020	14/05/2020		14/05/2020	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.01	Org-029	<0.01	1	<10	<10	0	94	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.01	Org-029	<0.01	1	<10	<10	0	86	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.01	Org-029	<0.01	1	<10	<10	0	93	[NT]
6:2 FTS	µg/kg	0.01	Org-029	<0.01	1	<10	<10	0	93	[NT]
8:2 FTS	µg/kg	0.02	Org-029	<0.02	1	<20	<20	0	90	[NT]
Surrogate <sup>13</sup> C <sub>8</sub> PFOS	%		Org-029	101	1	104	102	2	96	[NT]
Surrogate <sup>13</sup> C <sub>2</sub> PFOA	%		Org-029	104	1	94	99	5	97	[NT]
Extracted ISTD <sup>18</sup> O <sub>2</sub> PFHxS	%		Org-029	108	1	107	110	3	107	[NT]
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOS	%		Org-029	103	1	98	101	3	111	[NT]
Extracted ISTD <sup>13</sup> C <sub>4</sub> PFOA	%		Org-029	102	1	119	122	2	107	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> 6:2FTS	%		Org-029	100	1	160	158	1	104	[NT]
Extracted ISTD <sup>13</sup> C <sub>2</sub> 8:2FTS	%		Org-029	100	1	129	133	3	121	[NT]

## Result Definitions

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

## Quality Control Definitions

<b>Blank</b>	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.
<b>Duplicate</b>	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.
<b>Matrix Spike</b>	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.
<b>LCS (Laboratory Control Sample)</b>	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.
<b>Surrogate Spike</b>	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.

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).

PQLs raised as the sample matrix required dilution.