

ALS Now Tests PFOS to the Freshwater Species Protection Level of 99%

PFOS / PFAS Future LOR Requirements

With regulation in the early stages in Australia, PFAS LOR requirements are changing with time as industry experts look to both local and overseas guidance and regulation.

ALS has seven PFAS testing laboratories in Australia (2), North America (2) and Europe (3), and utilise this global network in assessing future market needs. Recent feedback in Europe is that the industry is seeking PFOS LORs down to 0.0001µg/L. These new trace levels present a new range of challenges primarily about managing background and keeping a pristine sampling and laboratory environment however, with good systems and control these limits are achievable.

This newest method developed and validated in Australia takes a further step in reducing the LORs while at the same time building in strong control to avoid carryover and potential false positives. This method is designed for marine water and surface or ground water samples that are not expected to contain PFOS/PFAS at levels above 0.1µg/L.

Other ALS EnviroMails on PFAS

ALS has produced a series of Technical EnviroMails on PFAS over the years with hyperlinks following:

[EnviroMail 38 – PFOS and PFOA – June 2009](#)

[EnviroMail 67 – Testing-of-Extended-PFCs - March 2013](#)

[EnviroMail 86 – PFCs in Landfill leachate - February 2015](#)

[EnviroMail 94 – PFOS PFOA and why do my laboratory results not agree- August 2015](#)

[EnviroMail 109 PFOS Trace Analysis to meet trace guideline requirements – August 2016](#)

[EnviroMail 117 – PFAS testing in Brisbane and TOP Assay challenges & developments - November 2017](#)

[EnviroMail 119 – PFAS in Biota now covered by ALS NATA Accreditation - February 2018](#)

ALS Method and LOR Information

ALS METHOD CODE

- » EP231-SUT (12 analytes)
- » EP231X-SUT (28 analytes)

LIMITS OF REPORTING (LOR)

- » 0.0002 (PFOS) to 0.001 µg/L (see overleaf)

METHOD REFERENCE

In house

CONTAINER REQUIREMENTS

- » 2 x 250mL unpreserved HDPE bottles per sample
- » For laboratory QA/QC an additional 250mL HDPE bottle is required for every 10 samples submitted for analysis

WA Interim Guidelines on the Assessment and Management of PFAS

In February 2016, the WA Department of Environment Regulation released an interim Contaminated Sites guideline on the Assessment and management of PFAS which included some very good guidance (see section 5.2 – link to the site follows).

[WA DER Interim Guideline of the Assessment and Management of PFAS](#)

The Screening levels for PFOS for Freshwater to a species protection level of 99% is 0.00023µg/L. This limit is extremely low and the new ALS LOR of 0.0002µg/L for PFOS, will meet and exceed this requirement.

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PFAS National Environmental Management Plan (NEMP)

In January 2018, the Heads of EPA Australia and New Zealand (HEPA) and the Australian Government Department of the Environment and Energy (DoEE) released the PFAS National Environmental Management Plan (NEMP). The aim being to consolidate current knowledge into a nationally consistent approach to the environmental management of PFAS.

The NEMP includes the ANZECC 99% species protection level for PFOS in freshwater of 0.00023µg/L and sets the same level as an interim guidance value for marine protection.

[PFAS NEMP – January 2018](#)

Other Australian Guidance

The Department of Defence in Australia issued an interim screening criteria in May 2015. The drinking water limits in this guidance are fairly typical at 0.2µg/L for PFOS and well above the low level or even standard ALS methods. The key in this guidance is that there are limits set at 0.65ng/L or 0.00065µg/L for PFOS. This water protection limit is not about drinking water but more about protection of human health via seafood consumption. The Maximum Permissible Concentration is not about direct toxicological effects but designed to be used where seafood is caught for consumption. The new ALS method provides a PFOS LOR at approximately one third of this limit.

Other EU Guidance


The EU Inland water quality standards have similar low limit of 0.65ng/L as an annual average. Other surface waters have an even lower limit of 0.13ng/L (0.00013µg/L) as an annual average to ensure the long term quality of the aquatic environment. If these sort of annual averages are the future in Australia then it is reasonable to assume that some samples will need to be tested down to limits of 0.0001 or even 0.00005µg/L otherwise an average result at these limits will not be possible.

Currently the lowest LOR available globally at ALS is 0.00009µg/L for PFOS in the EU, albeit additional chemicals are currently being added to this method. This provides a methodology and experience for ALS to further lower these LORs should this become a requirement in Australia.

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GROUP / ANALYTES	WATER Std. Level (µg/L)	WATER Low Level (µg/L)	⁵ WATER Super Trace (µg/L)	⁵ WATER Super Ultra Trace (µg/L)	SOIL (mg/kg)	BIOTA* (µg/kg)	PRODUCT (mg/kg)
Method Code	EP231X	EP231X-LL	EP231X-ST	EP231X-SUT	EP231X	EP231X	EP231X
Perfluoroalkane Sulfonic Acids							
Perfluorobutane sulfonic acid (PFBS) included in Short Suite	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluoropentane sulfonic acid (PFPeS)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluorohexane sulfonic acid (PFHxS) included in Short Suite	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluoroheptane sulfonic acid (PFHpS)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluorooctane sulfonic acid (PFOS) included in Short Suite	0.01	0.002	0.0003	0.0002	0.0002	1	0.01
Perfluorodecane sulfonic acid (PFDS)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluoroalkane Carboxylic Acids							
Perfluorobutanoic acid (PFBA) included in Short Suite	0.1	0.01	0.002	0.002	0.001	5	0.1
Perfluoropentanoic acid (PFPeA) included in Short Suite	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluorohexanoic acid (PFHxA) included in Short Suite	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluoroheptanoic acid (PFHpA) included in Short Suite	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluorooctanoic acid (PFOA) included in Short Suite	0.01	0.002	0.0005	0.0005	0.0002	1	0.01
Perfluorononanoic acid (PFNA)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluorodecanoic acid (PFDA)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluoroundecanoic acid (PFUnDA)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluorododecanoic acid (PFDoDA)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluorotridecanoic acid (PFTrDA)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
Perfluorotetradecanoic acid (PFTeDA)	0.05	0.005	0.0005	0.0005	0.0005	2	0.05
Perfluoroalkyl Sulfonamides							
Perfluorooctane sulfonamide (FOSA)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	0.05	0.005	0.001	0.001	0.0005	2	0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	0.05	0.005	0.001	0.001	0.0005	2	0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	0.05	0.005	0.001	0.001	0.0005	2	0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	0.05	0.005	0.001	0.001	0.0005	2	0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	0.02	0.002	0.0005	0.0005	0.0002	1	0.02
(n:2) Fluorotelomer Sulfonic Acids							
4:2 Fluorotelomer sulfonic acid (4:2 FTS) included in Short Suite	0.05	0.005	0.001	0.001	0.0005	2	0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS) included in Short Suite	0.05	0.005	0.001	0.001	0.0005	2	0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS) included in Short Suite	0.05	0.005	0.001	0.001	0.0005	2	0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS) included in Short Suite	0.05	0.005	0.001	0.001	0.0005	2	0.05
Sums							
Sum of PFAS	0.01	0.002	0.0003	0.0002	0.0002	-	-
¹ Sum of PFHxS and PFOS	0.01	0.002	0.0003	0.0002	0.0002	-	0.01
² Sum of PFAS (WA DER List)	0.01	0.002	0.0003	0.0002	0.0002	-	-
³ Sum of the total oxidisable precursors for C7 to C14 compounds (TOPA C7-C14) as fluorine	-	-	-	-	-	-	0.01
⁴ Sum of TOPA C4-C14 plus C4-C8 sulfonates	0.01	0.002	-	-	0.0002	-	0.01

¹ Sum required for enHealth drinking water guideline and QLD Foam Policy for short-chain fluorinated compounds.

² PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2-FTS and 8:2-FTS.

³ Queensland Operational Policy on Environmental Management of Firefighting Foam (6.2.1 and 6.2.2). Foams not meeting criteria must be withdrawn from service.


⁴ Queensland Operational Policy on Environmental Management of Firefighting Foam (6.4.2), guidance set for disposal of foam concentrates and waste waters. General analytical requirement for all matrices – see Fluorinated organic compound analyses in the definitions section.

⁵ Super trace method is not suitable for waste waters. These will not be accepted for this test.

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