BIO

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Education

PhD, Analytical Chemistry,
University of Waterloo, Canada

10+ years of extensive experience in research & development, analytical method development and validation, project management and laboratory management in environmental, pharmaceutical and food industries

Knowledgeable in operation and optimization of analytical techniques applied in environmental testing laboratories: GC, GC-MS, GC-MS/MS, comprehensive two-dimensional gas chromatograph (GCxGC), HPLC, UPLC, LC-MS and LC-MS/MS

Canadian PFAS Specialist Laboratory

LC-MS/MS analysis of PFAS at ALS Environmental, Waterloo

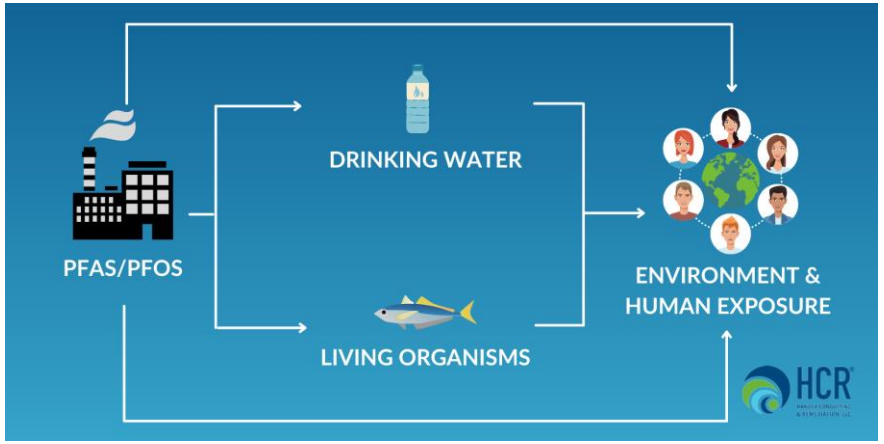
Aqueous samples, soils, tissue samples

Turnaround Time

Direct Aqueous Injection
7 days Regular Samples
2 days Rush Samples

Waters and Soils
10 days Regular Samples
4 days Rush Samples

Waters – EPA 1633
15 days Regular Samples
10 days Rush Samples



LC-MS/MS analysis of PFAS at ALS Environmental, Waterloo

Analytes reported by ALS:

Analyte Class	Target Analyte Name	Abbreviation
Perfluoroalkyl carboxylic acids	Perfluorobutanoic acid	PFBA
	Perfluoropentanoic acid	PFPeA
	Perfluorohexanoic acid	PFHxA
	Perfluoroheptanoic acid	PFHpA
	Perfluorooctanoic acid	PFOA
	Perfluorononanoic acid	PFNA
	Perfluorodecanoic acid	PFDA
	Perfluoroundecanoic acid	PFUnA
	Perfluorododecanoic acid	PFDoA
	Perfluorotridecanoic acid	PFTrDA
	Perfluorotetradecanoic acid	PFTeDA
Perfluoroalkyl sulfonic acids, Acid form	Perfluorobutanesulfonic acid	PFBS
	Perfluoropentansulfonic acid	PFPeS
	Perfluorohexanesulfonic acid	PFHxS
	Perfluoroheptanesulfonic acid	PFHpS
	Perfluorooctanesulfonic acid	PFOS
	Perfluorononanesulfonic acid	PFNS
	Perfluorodecanesulfonic acid	PFDS
	Perfluorododecanesulfonic acid	PFDoS
Fluorotelomer sulfonic acids	1H,1H, 2H, 2H-Perfluorohexane sulfonic acid	4:2FTS
	1H,1H, 2H, 2H-Perfluorooctane sulfonic acid	6:2FTS
	1H,1H, 2H, 2H-Perfluorodecane sulfonic acid	8:2FTS
Perfluorooctane sulfonamides	Perfluorooctanesulfonamide	PFOSA
	N-methyl perfluorooctanesulfonamide	NMeFOSA
	N-ethyl perfluorooctanesulfonamide	NEtFOSA
Perfluorooctane sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA
	N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA

LC-MS/MS analysis of PFAS at ALS Environmental, Waterloo

Analytes reported by ALS:

Analyte Class	Target Analyte Name	Abbreviation
Perfluorooctane sulfonamide ethanols	N-methyl perfluorooctanesulfonamidoethanol	NMeFOSE
	N-ethyl perfluorooctanesulfonamidoethanol	NEtFOSE
Per- and Polyfluoroether carboxylic acids	Hexafluoropropylene oxide dimer acid	HFPO-DA
	4,8-Dioxa-3H-perfluorononanoic acid	ADONA
	Perfluoro-3-methoxypropanoic acid	PFMPA
	Perfluoro-4-methoxybutanoic acid	PFMBA
	Nonafluoro-3,6-dioxaheptanoic acid	NFDHA
Ether sulfonic acids	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS
	Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA
Fluorotelomer carboxylic acids	3-Perfluoropropyl propanoic acid	3:3FTCA
	2H,2H,3H,3H-Perfluorooctanoic acid	5:3FTCA
	3-Perfluoroheptyl propanoic acid	7:3FTCA
Miscellaneous PFAS; Additional compounds reported by ALS		**FDEA 10 2FTCA**
		FDUEA 10 2FTUCA
		FHEA 6 2FTCA
		FHUEA 6 2FTUCA
		FOEA 8 2FTCA
		FOUEA 8 2FTUCA
		PFTrDS
		PFUdS
		PFECHS
		PFHxDA
		PFODA
		10:2FTS

Future objectives and perspective

Development of high-throughput assays – laboratory automation, high throughput LC-MS/MS/multiplexing

4th Draft Method1633 - Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS

- Accreditation (DoD and ISO 17025) approval stage for aqueous samples (wastewater, surface water, and groundwater)
- Finalization of method validation for soil samples

Expanding PFAS analysis beyond environmental matrices ?

EnviroMail™ / Canada

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Extended PFAS Analyte Reporting and Trace-Level Water Testing by EPA Method 1633

After first offering testing of waters and soils for an extended suite of up to 51 Perfluorinated Alkyl Substances (PFAS) in Oct 2021, ALS Canada now also offers trace-level testing of surface waters, groundwaters, and wastewaters by US EPA Method 1633 for a further-expanded PFAS list, which now includes 12 additional PFAS analytes beyond the standard 40 analyte list from Method 1633.

ALS Canada's Extended PFAS Testing Suites

ALS has been testing for complex suites of PFAS analytes globally under accredited methods since the late 2000s, supporting global trends to monitor and restrict these persistent chemicals in the environment. What started out as testing for PFOS and PFOA has steadily grown to include dozens of new compounds of interest as PFAS regulation and knowledge of their precursors and degradation processes increases. The ALS global network of expert PFAS scientists are constantly developing new capabilities to meet local and global testing needs. This includes global reviews of emerging analytes, including those becoming increasingly regulated or requested by our global customers. The availability of testing for expanded parameter lists reduces the risk of underestimating cumulative PFAS. The ALS extended parameter suites include analysis of PFECHS, found in aviation hydraulic oils, as well as fluorotelomer carboxylic acids 6:2 FTCA, 8:2 FTCA, and 10:2 FTCA, which are major components in legacy landfill leachates. All 40 PFAS analytes from Method 1633 are included in the ALS extended suites, plus up to 12 additional analytes, as shown in Table 2.

PFAS in July 2022 under the Atlantic Canada RBCA Environmental Quality Standards. In January 2023, Alberta added PFOS and PFOA to their Tier 1 Soil and Groundwater Remediation Guidelines. And on April 12, 2023, Health Canada released a draft new Objective for Canadian Drinking Water Quality, which proposes to address Total PFAS as a class (targeted PFAS list not yet finalized). The proactive ALS expansion of analytical capabilities helps to prepare stakeholders for increased regulatory requirements expected in the near future.

New Water Testing by EPA Method 1633

ALS Waterloo, our Canadian PFAS specialist laboratory, is pleased to announce new testing capabilities for an extended PFAS parameter suite of 52 analytes in