

Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS Analysis

Northern Lake Service

400 N. Lake Ave.

Crandon, WI 54520

800-278-1254

www.nlslab.com

Northern Lake Service



Northern Lake Service, Inc.

Founded in 1974

Wisconsin based / Family owned and operated

Over 450 years combined experience

>50% of municipalities have SDWA samples analyzed by NLS, either directly or by subcontract



Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS Analysis – Crandon, WI???

Unregulated Contaminant Monitoring Rule (UCMR)

- Currently about 100 SDWA targets
- Monitors for 20-30 currently unregulated compounds on a cyclical basis
- All municipalities over 10,000 and 800 small systems
- UCMR 1 2001 – 2003
- UCMR 2 2008 – 2010
- UCMR 3 2013 – 2015
- UCMR 4 2018 – 2020

Northern Lake Service



Northern Lake Service, Inc.

UCMR

- Laboratory pre-qualified by EPA
- Combination of method development, PT samples, and on-site audits
- No other lab has fully participated in all 4 UCMRs
- Chosen to perform small-system analyses directly for EPA

Northern Lake Service



Northern Lake Service, Inc.

UCMR 3

- 6 Perfluorinated compounds included in UCMR3
- Expectation that these compounds could be found in Drinking Water due to their widespread use (4 of 6 compounds were found)
- For the first time, a UCMR analysis wasn't mothballed at the conclusion of a study

How low is low?



Northern Lake Service, Inc.

Just to put some of these levels into terms that are easier to picture...

1 ppm = 1 second in about 11.5 days [think BOD]

1 ppb = 1 second in about 31.7 years [think VOCs]

1 ppt = 1 second in about 31,700 years! [PFOA/PFOS]

Northern Lake Service



Northern Lake Service, Inc.

UCMR 3

6 compounds included in UCMR3

Perfluorobutanesulfonic acid (PFBS)

Perfluoroheptanoic acid (PFHpA)

Perfluorohexanesulfonic acid (PFHxS)

Perfluorooctanoic acid (PFOA)

Perfluorononanoic acid (PFNA)

Perfluorooctanesulfonic acid (PFOS)

2 of these weren't even found in UCMR 3

2 of these were rarely found

PFOA and PFOS were found most frequently

Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS post UCMR 3

More compounds added

Perfluorohexanoic acid (PFHxA)

Perfluorodecanoic acid (PFDA)

Perfluoroundecanoic acid (PFUnA)

Perfluorododecanoic acid (PFDoA)

Perfluorotridecanoic acid (PFTrDA)

Perfluorotetradecanoic acid (PFTA)

Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS post UCMR 3

And even MORE compounds added

Perfluoro-2-propoxypropanoic acid (GenX)

N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)

N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)

1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2FTS)

1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2FTS)

We are looking at 29 compounds as our likely list by years-end

Can be a 4 week process to validate an additional analyte

Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS - Methods

- Analysis by Method 537.1, Version 1.0
- LC/MS/MS
- Approved method for Drinking Water
- ASTM has written methods for soil and for 'other matrices'
- SW846 has draft methods written, 8327 and 8328, for non-potable water and for solids, respectively

Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS - Briefly

- Very water soluble
- Very mobile in water
- Unlike most Synthetic Organic Compounds (SOCs)
- Found in manufacturing locations
- Small communities have had contamination, not just large plants
- Fire retardant foam / military bases

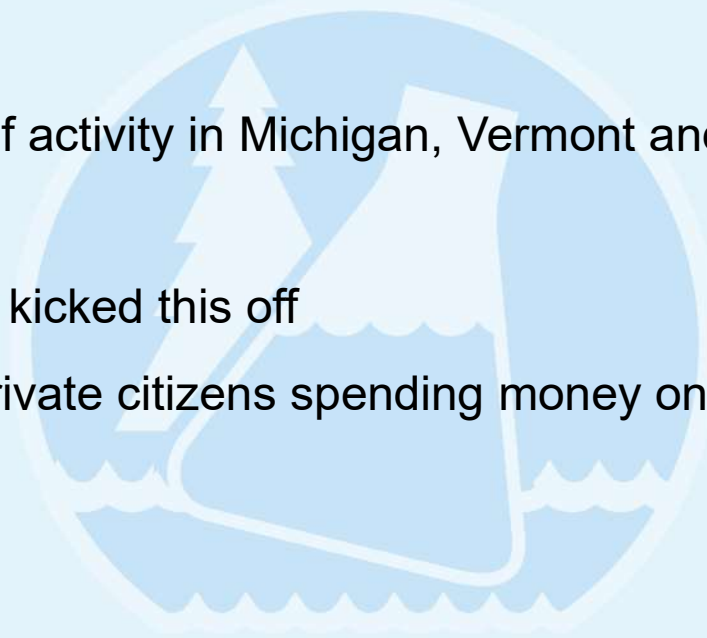
Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS - Now

- There's been a LOT of activity in Michigan, Vermont and New York regarding PFOA/PFOS
- Private citizen activity kicked this off
- We're seeing many private citizens spending money on this



Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS - Now

- Push for certification
- By what method and at what levels?
- Who would run all of those samples?



Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS – What level?

State	Compound	Level (ppt)
Connecticut	Sum of PFOA, PFOS, PFNA, PFHxS, PFHpA	70
Maine	Sum of PFOA and PFOS	70
Minnesota	PFOA	35
	PFOS	27
	PFHxS	27
New Hampshire	Sum of PFOA and PFOS	70
New Jersey	PFNA	13
	PFOA	14
North Carolina	GenX	140
Vermont	Sum of PFOA and PFOS	20
West Virginia	Sum of PFOA and PFOS	70

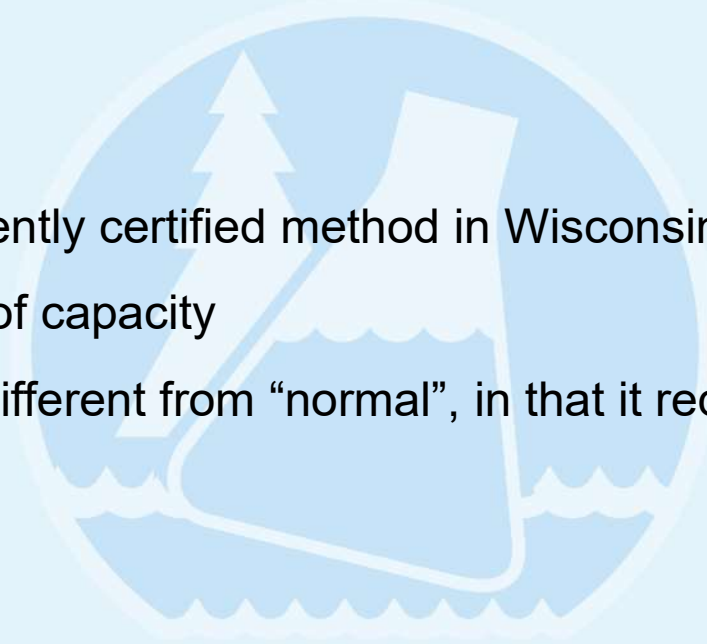
Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS – What method?

- LC/MS/MS
- Not used for any currently certified method in Wisconsin
- Presumably not a lot of capacity
- Sample collection is different from “normal”, in that it requires a field blank with each sample



Northern Lake Service



Northern Lake Service, Inc.

PFOA / PFOS – Issues

- Standard availability
- Solvent compatibility
 - Solvent ratios
 - Solvent quality
- Contamination concerns
- Method development
 - Finding a standard source
 - Seeing how the compound reacts/extracts
 - Where does it show itself in relation to other compounds



Northern Lake Service



Northern Lake Service, Inc.

Paul Junio
Northern Lake Service
400 N. Lake Ave.
Crandon, WI 54520
715-478-6052

2420 N. Grandview Blvd.
Waukesha, WI 53188
262-547-3406

paulj@nlslab.com