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Aclarity: PFAS Destruction

Breakthrough **PFAS destruction system**
for wastewater

Founded 2017– **University of
Massachusetts**

In market today with paid field
installations and strong customer pipeline

Focus in PFAS **waste streams, landfill
leachate, and AFFF**

Strong industry customers and first-
mover advantage



Julie Bliss Mullen
CEO & Co-Founder

PhD ABD, UMass
EPA
Forbes 30 Under 30, NEWIN/NEWEA Innovator of the Year



Orren Schneider
Chief Science Officer

PhD, UMass
American Water, Haze, Black & Veatch



Ray Galgano
VP of Finance

MBA, UMass
Yankee Candle, WR Grace, Dow, Welch's



Jose Alvarez
Director of Operations

PhD, WPI
Wright-Pierce, City of Framingham MA, Aquas De Cartagena



Market is looking for a PFAS destruction solution

Bottom-up public pressure



Action today at all levels

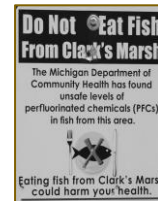


Dwindling disposal options

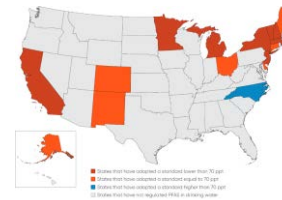
Common Items with PFAS

- FOOD PACKAGING:** microwave popcorn bags, sandwich wrappers, takeout containers, fast food wrappers
- HOUSEHOLD ITEMS:** makeup, floor, waxes, paints, stains
- STAIN-RESISTANT:** carpets, rugs, and furniture
- NONSTICK COOKWARE**
- OUTDOOR GEAR:** with a "durable water repellent" coating
- FIREFIGHTING FOAM**

Local



State



Federal

- Biden Admin restricted DoD to incinerate PFAS
- PFOA and PFOS hazardous under CERCLA by 2023
- Infrastructure law: \$10B for monitoring and remediation

Industry

- \$1B in RFPs already outstanding
- 40% CAGR

Corporate

DuPont, Chemours, Corteva to pay Delaware millions over damage from PFAS or 'forever chemicals'

Jeff Neiburg Delaware News Journal
Published 4:22 p.m. ET July 13, 2021 | Updated 7:02 p.m. ET July 13, 2021



Landfill

Raising fees, refusing loads



Wastewater Treatment Plant

Raising fees, refusing loads



Incinerator

Expensive, risk of being disallowed

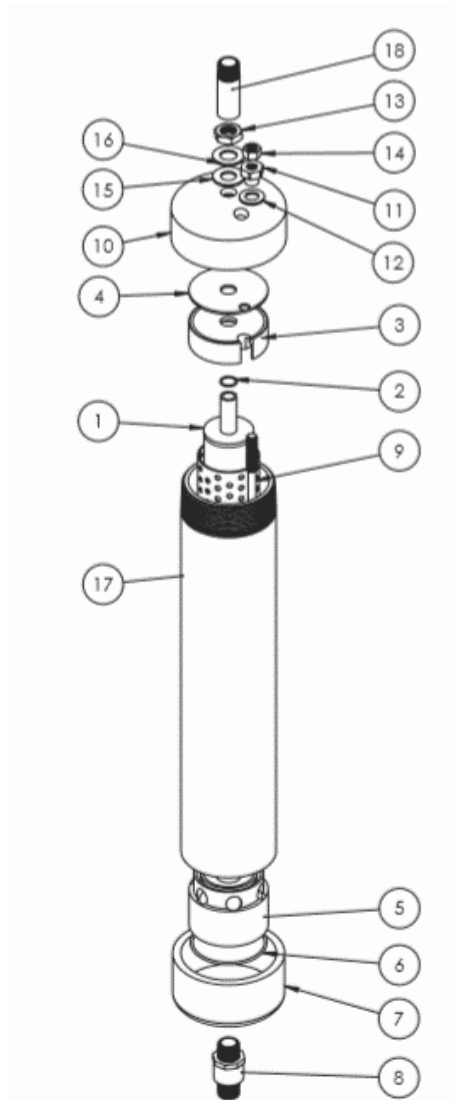


Other destruction technologies

Still in the lab or not economic



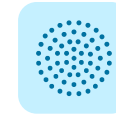
Aclarity destroys PFAS in wastewater



Electrochemical oxidation system



Free electrons **break C-F bonds** resulting in CO_2 , HF, F^-



Treats **broad range of difficult contaminants** at lower cost than current technologies

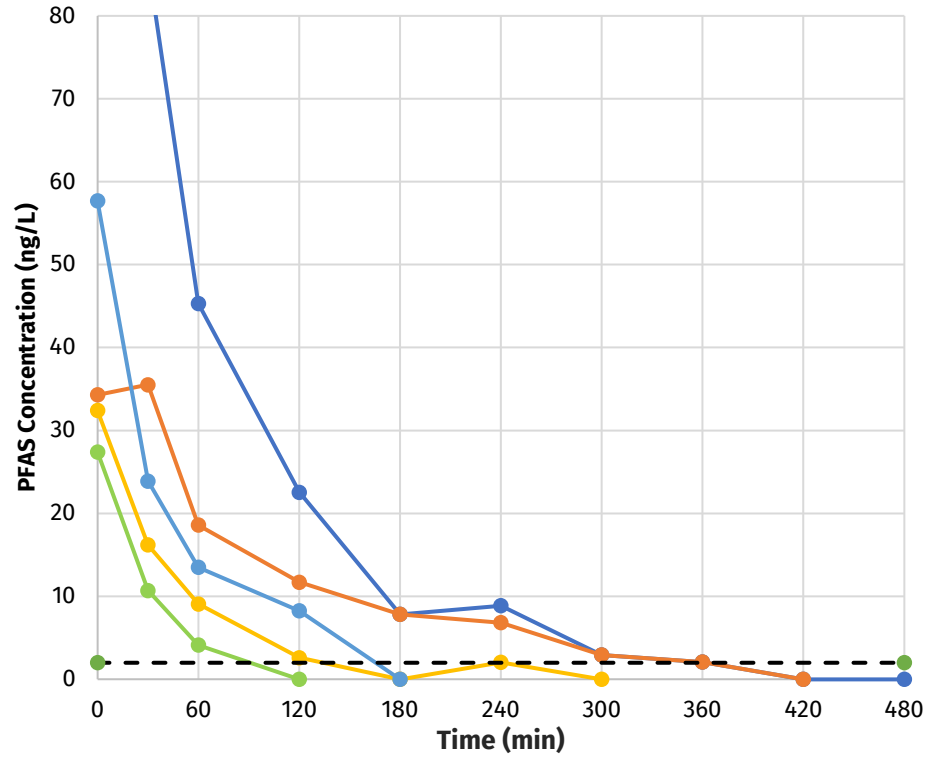


Simple and rugged enough to deploy on-site

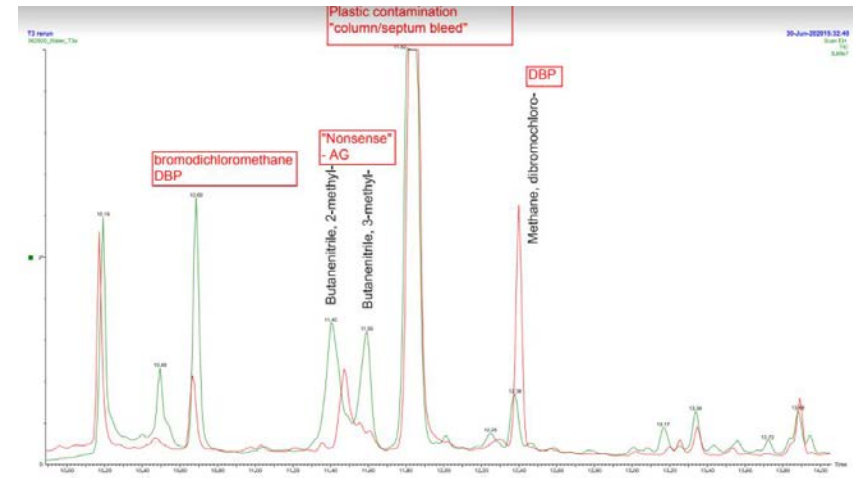


PFAS is solved permanently

Degrades PFAS to ND



Byproducts are not harmful



- No organic fluorine formed
- Largest peak is from column bleed
- Disinfection byproducts formed at low levels

Source: Alpha Analytical (report 5/4/20 with Aclarity samples); Bryan Cave Leighton Paisner, "State-by-State Regulation of Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water" (July 2019)
 Note: EPA and MA levels are the sum of individual levels, shown here as the average allowed for each; median used if state has different limits for individual chemicals



Proven in the field

Technical advantage

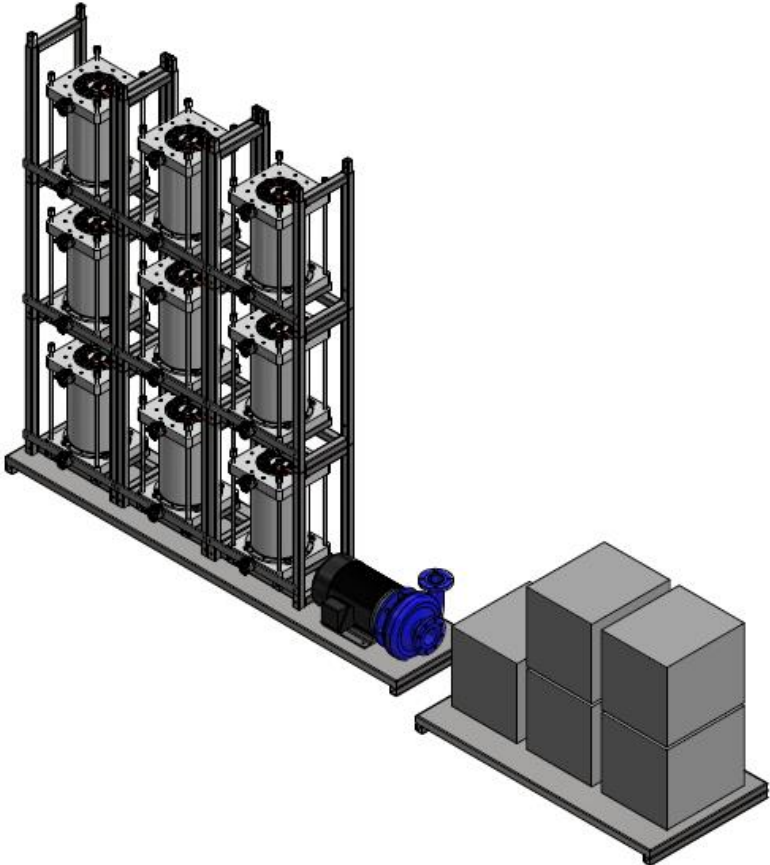
- 1/10th cost anode competitors
- Low energy (<0.5 kWh/gal)
- Long-lasting electrodes (years)

Low maintenance

- Remote operation
- Tap water flushing
- Periodic acid/CLR rinse



On-site Mobile Bench System testing for full-scale sizing



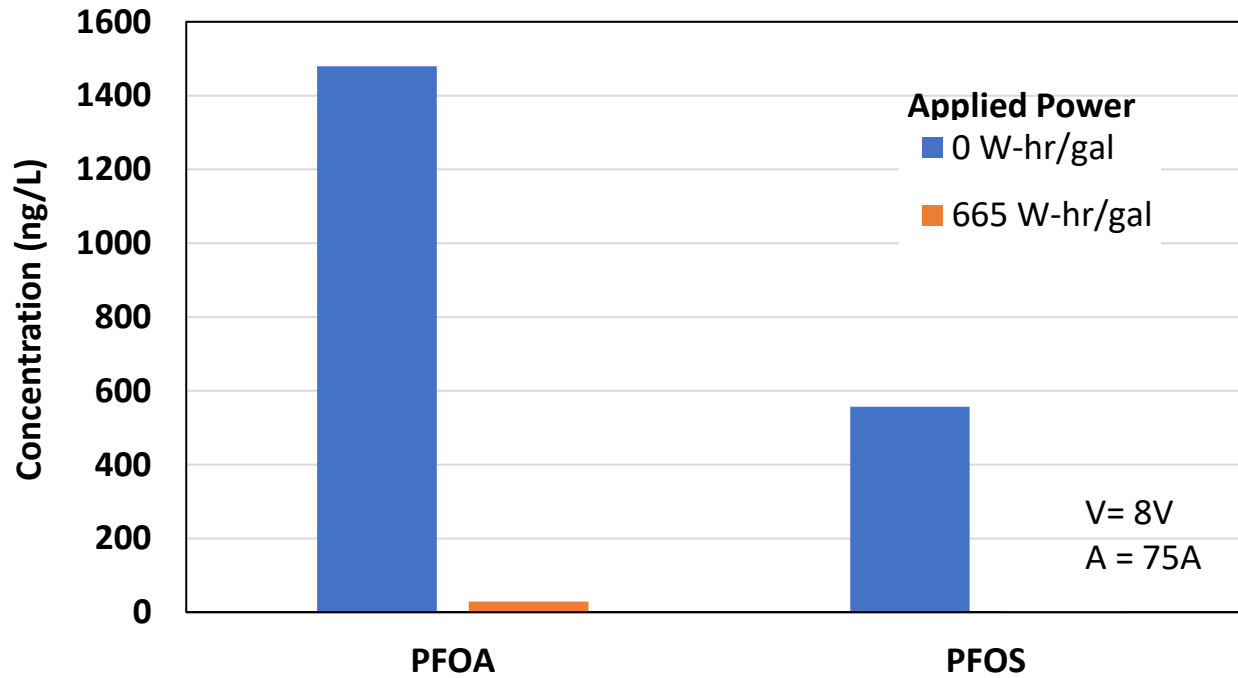
1,4-Dioxane and PFAS in Groundwater

Time min	1,4-Dioxane		PFOA ng/L	PFNA ng/L	PFOS ng/L	1,2- Dichloroethane μg/L
	μg/L	% Removal				
0	8.72	0%	28.9	2.04	18.5	1.1 J
60	8.10	7%				
120	6.77	22%				
180	5.41	38%				
240	4.21	52%	1.88	<0.282	<0.456	<2



PFAS in Landfill Leachate

Initial concentration of PFAS: ~2 µg/L
 Target concentration of PFOS: 60 ng/L
 Target concentration of PFOA: 2,300 ng/L



Case	Initial C (ng/L)	Target C (ng/L)	Flow (GPD)	# SR10s	CAPEX (\$MM)	OPEX (\$/kgal)
PFOS (ng/L)	557	60	180000	67	1.4	6.06
PFOS (ng/L)	557	60	43200	17	0.37	6.48





THANK YOU!

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