



Addressing Emerging Contaminates at Groundwater Discharge Sites in the State of New Hampshire

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NH Groundwater Discharge Permit Rules

- Discharge to the ground or groundwater of *non-domestic wastewater* or *domestic wastewater* at volumes $>20,000$ GPD
- Distribution, discharge and (re)use of reclaimed wastewater
- Siting, testing, operation and monitoring of Aquifer Storage and Recovery (ASR) projects



Permit Requirements

- Hydrogeologic Study
- Infiltration/loading study
- Chemical transport study
- Sets effluent quality standards
- Establishes long term monitoring program

Groundwater Discharge Permit Standards

Discharge Methods

- Rapid Infiltration Basins
- Slow Rate Spray irrigation
- E-Snow Spray
- Overland Flow/Drip Irrigation
- Subsurface Weep Line
- Large Septic Systems

GeoFlo –
Weep Line



E-Snow



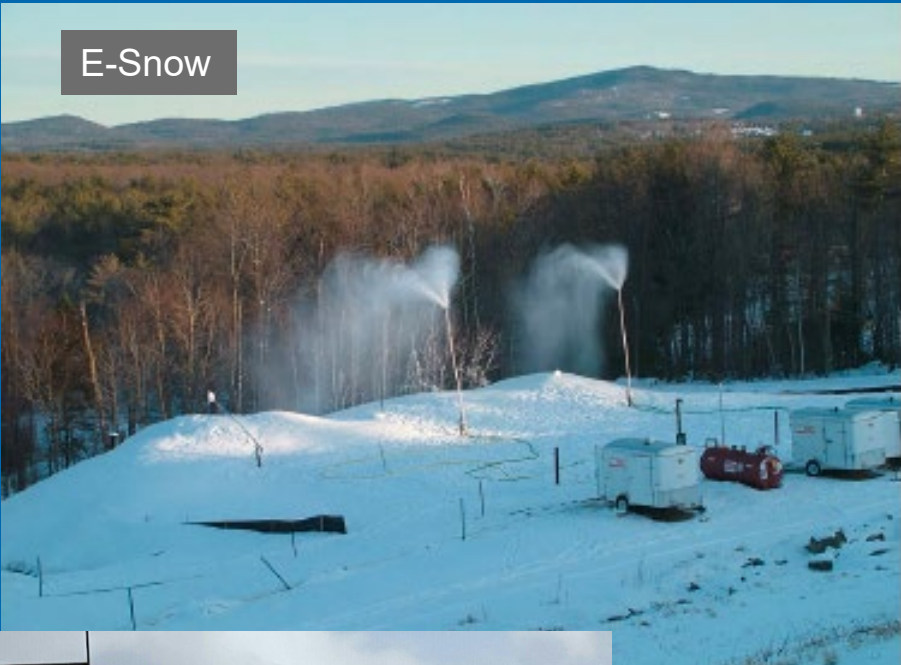
Rapid Infil Basins (RIBs)



Spray
Irrigation



E-Snow



Ag - Irrigation



Crushed
Aggregate Wash



Power
Production –
Boiler Water

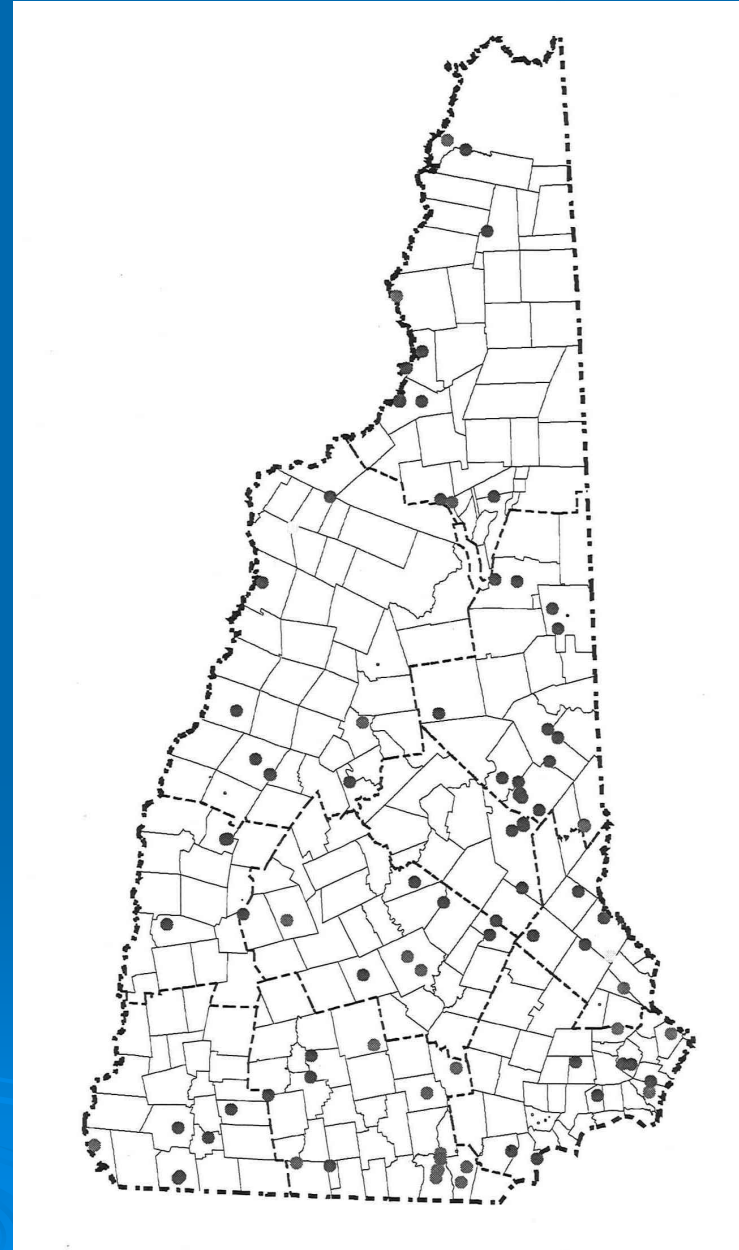


Groundwater Permit Sites

111 sites

- 39 Unlined Lagoon(s) sites
- 20 Rapid Infiltration Sites
- 9 Spray Irrigation sites
- 8 Septage Lagoons
- 3 Overland Flow / Drip Irr
- 2 Sludge Monofills
- 2 Aquifer Recharge

- 28 Large Septic & Industrial Septic Systems



Other Discharge Classifications

Registrations

SUBSURFACE DISPOSAL of NONDOMESTICWASTEWATER

- Storm Water Drainage Wells (Structures)
- Geothermal Wells
- Groundwater Recharge Fields
- Non-Domestic Wastewater
- (Industrial /Commercial wastewater to septic such as: Salons, Kennels, noncontact cooling water, Boiler Blow Down, Food processing, medical service & labs, drinking water treatment wastewater
- Large Septic Systems (flow >1,500 gpd)

Temporary Discharge Permit

Drinking Water Source Development

- Pump Testing
- Well Rehabilitation
- Tank Repair & Maintenance

Short Term Groundwater Remediation

- Groundwater Treatment at Oil and Hazardous Materials Spill Sites
- Injection of remedial compounds

Construction Dewatering



Response to Exceedances

- Within 10 days of receiving the test results that show the exceedance, notify the department of the exceedance;
- Within 21 days of receiving the test results that show the exceedance, test water for the regulated contaminant that exceeds the AGQS from each private or public drinking water supply well within 1,000 feet of the location where the exceedance occurred;
- Report the results of the testing required by (2), above, to the department within 45 days of collecting the samples;
- For exceedances of 1,4-dioxane, perfluorooctanoic acid, perfluorooctane sulfonic acid, perfluorononanoic acid, or perfluorohexane sulfonic acid, or any combination thereof, from a facility that discharges treated wastewater to groundwater, proceed as specified in Env-Wq 402.251.



Response to Exceedances

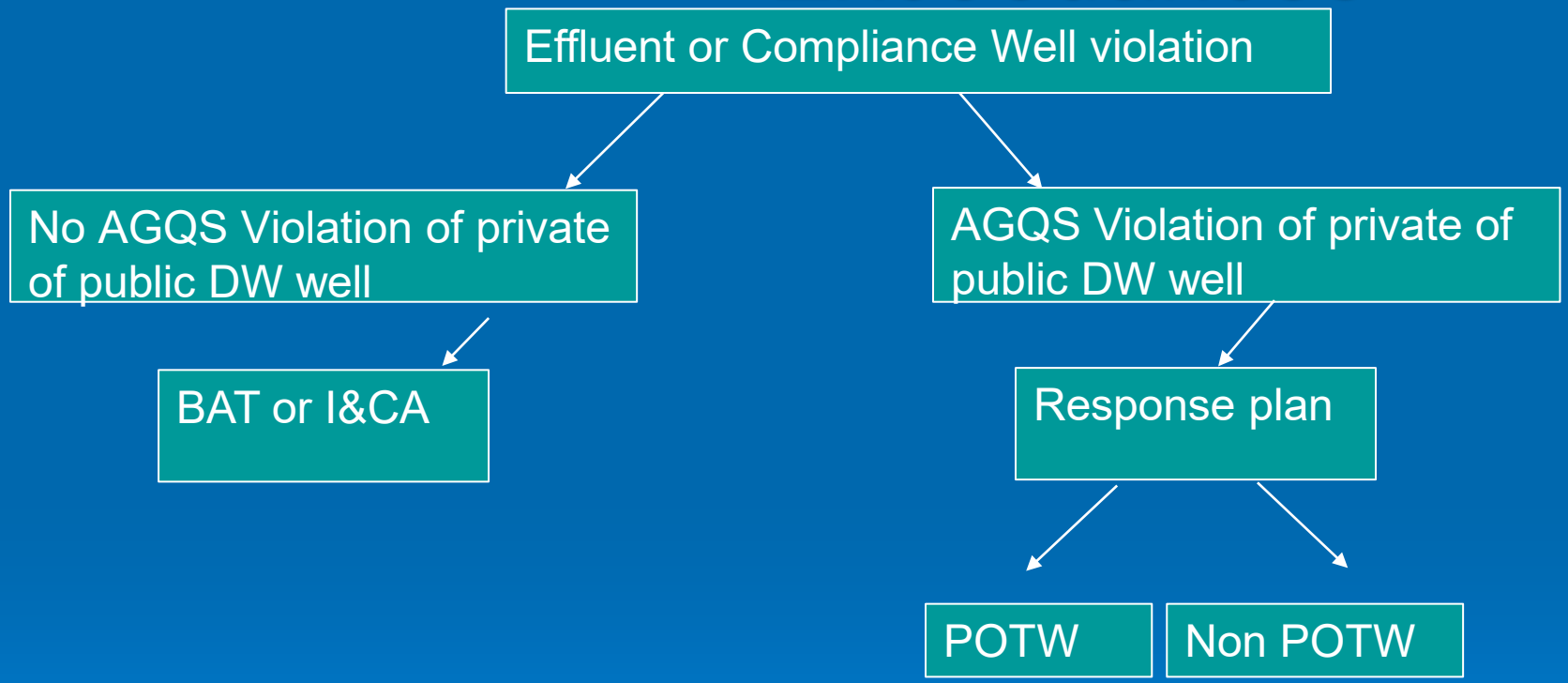
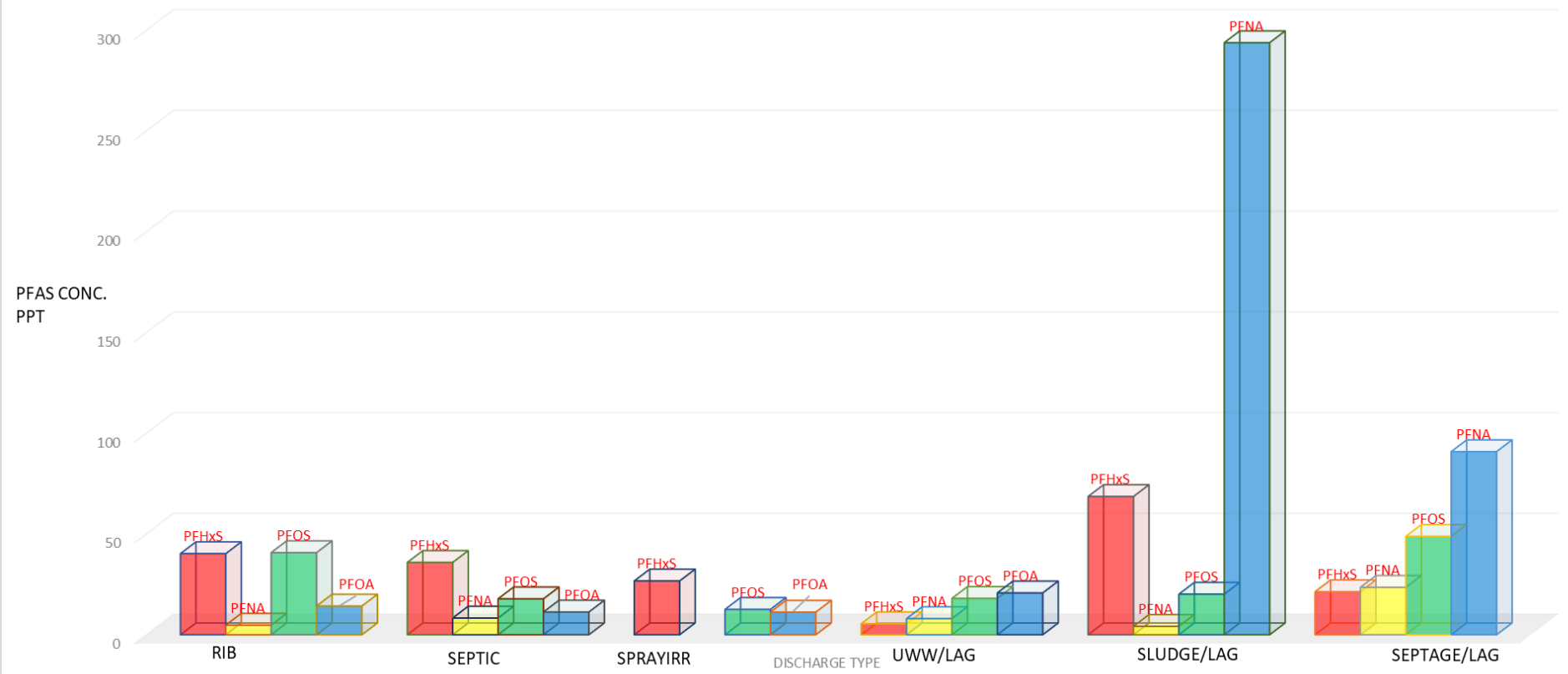


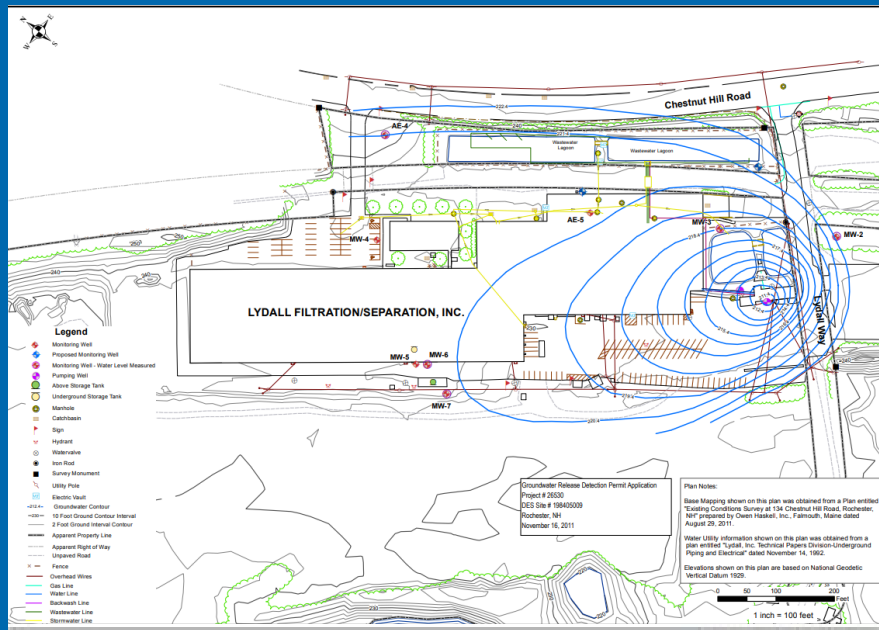
Table 402-2: Maximum Concentration of Certain Contaminants in
Treated Wastewater Discharged to Groundwater

Contaminant	Maximum Concentration
1,4-dioxane	2 µg/L
Perfluorohexane sulfonic acid (PFHxS)	Twice the AGQS established in Env-Or 603.03
Perfluorononanoic acid (PFNA)	Twice the AGQS established in Env-Or 603.03
Perfluorooctane sulfonic acid (PFOS)	Twice the AGQS established in Env-Or 603.03
Perfluorooctanoic acid (PFOA)	Twice the AGQS established in Env-Or 603.03

Table 600-1 AMBIENT GROUNDWATER QUALITY STANDARDS		
Chemical Name	CAS No.	AGQS µg/L (ppb)
Perfluorohexane sulfonic acid (PFHxS), total of all isomers	355-46-4	0.018
Perfluorononanoic acid (PFNA), total of all isomers	375-95-1	0.011
Perfluorooctane sulfonic acid (PFOS), total of all isomers	1763-23-1	0.015
Perfluorooctanoic Acid (PFOA), total of all isomers	335-67-1	0.012

Groundwater Monitoring Average PFAS per Discharge Type

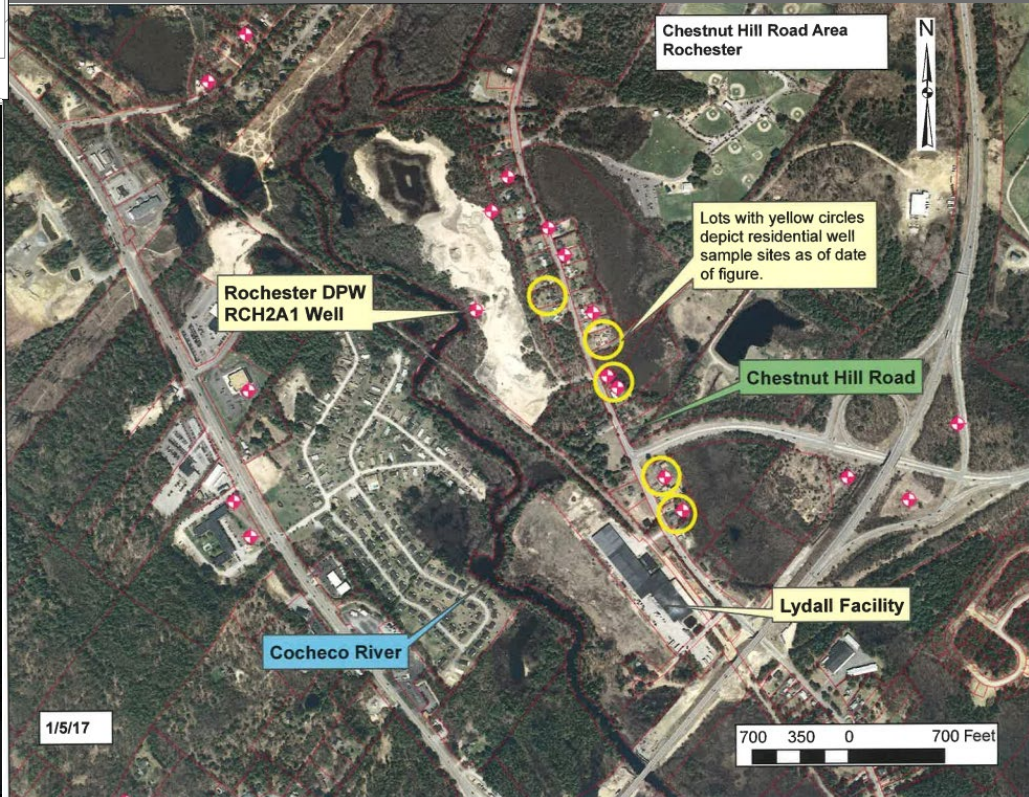




Lydall Performance Materials

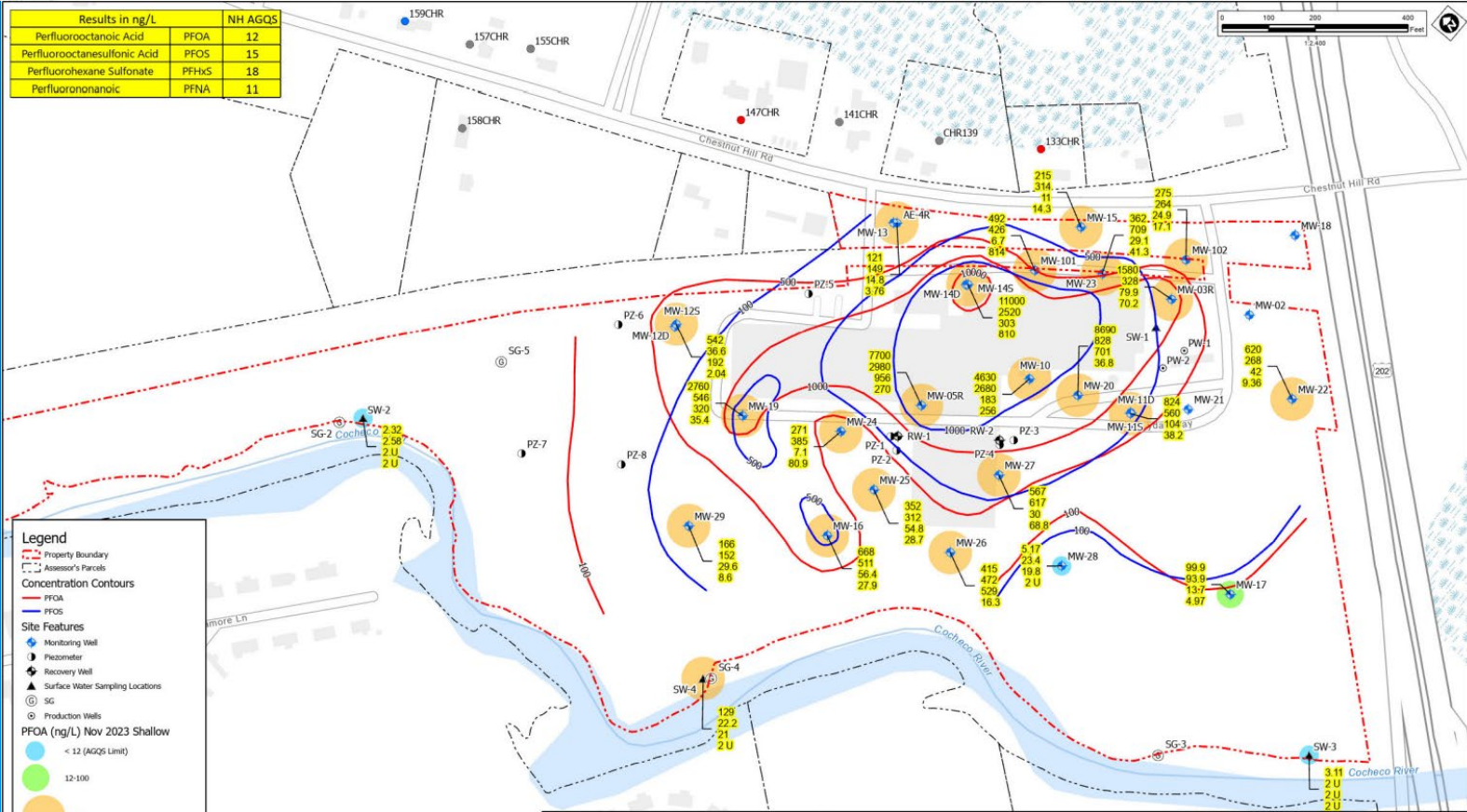
- Non-lined, Process Water Basins
- Discharge to POTW

1. Paper Machine Showers
2. Seal Water; Vacuum pumps/ Pumps
3. Overflow from Pulp Chests
4. Plant Washdowns
5. Pilot Machine Wastewaters



Rochester Monitoring

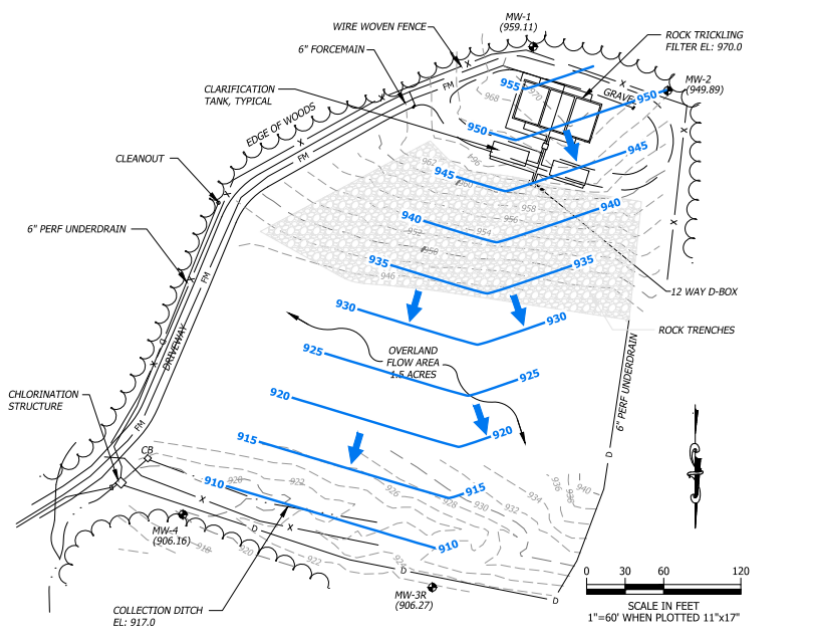
StationID	Station	U	Site	System Type	Town	Date	PFBS	PFBA	PFHPA	PFHXS	PFHXA	PFNA	PFOS	PFOA	PFPEA
198405011	MW1R		ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	5/5/2022								2.35	
198405011	MW2R	D	ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	11/6/2017							12	6.19	
198405011	MW2R	D	ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	5/5/2022									
198405011	MW3R	D	ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	11/6/2017	8.8	25.5	83.2	11.3	68.9	7.41	4.4	29	45
198405011	MW3R	D	ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	4/11/2018	8.3	21	57	9.7	53	18	23	14	32
198405011	MW3R	D	ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	11/1/2018							11.5	197	
198405011	MW3R	D	ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	5/5/2022	6.08	17.2	43.2	8.69	44.1	16.1	21.7	106	31.1
198405011	MW4R	D	ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	11/6/2017									
198405011	MW4R	D	ROCHESTER WWTF UWW LAGOON	Uww/Lag	ROCHESTER	5/5/2022									



Northumberland

- Overland flow
- Discharge to POTW

1. Overland flow
2. POTW
3. Mostly Domestic Wastewater
4. Response Plan/ PFAS
5. Perras



Northumberland Monitoring

Analytes	Ambient Groundwater Quality Standard (ng/L) effective 10/2019	MW-1	MW-1	MW-2	MW-2	MW-2	MW-3R	MW-3R	MW-3R	MW-3R	MW-4	MW-4	MW-4	MW-4	Peras	Peras	Influent	Influent	Effluent	Effluent
		5/9/2018	11/7/2019	5/9/2018	11/7/2019	11/30/2020	5/9/2018	11/7/2019	11/20/2020	5/23/2022	5/9/2018	11/7/2019	11/20/2020	5/23/2022	5/19/2020	5/23/2022	5/19/2020	5/23/2022	5/19/2020	5/23/2022
PFBA	NA	<4.2	<4.33	<4.24	<4.55	<4.55	<4.18	4.69	7.64	<2.05	12.4	11.2	6.02	8.19	<4.48	<2.07	<4.58	<2.02	<4.54	4.45
PFPeA	NA	<4.2	<4.33	4.24	8.67	4.63	12.7	12.1	33.7	4.79	41.9	29.5	20.9	24	<4.48	<2.07	<4.58	<2.02	<4.54	19.6
PFBS	NA	<4.2	<4.33	<4.24	<4.55	<4.55	11.1	12.6	16.1	4.06	39.6	40.9	22.9	21	<4.48	<2.07	<4.58	<2.02	<4.54	5.51
PFHxA	NA	<4.2	<4.33	7.15	13.9	8.09	12	10.9	26.6	4.85	40.2	30.7	21.7	27.6	<4.48	<2.07	<4.58	<2.02	9.83	24.9
PFHpA	NA	<4.2	<4.33	7.35	9.74	<4.55	<4.18	<4.40	<4.30	<2.05	11.4	8.78	5.69	4.96	<4.48	<2.07	<4.58	<2.02	<4.54	2.08
PFHxS	18	<4.2	<4.33	<4.24	<4.55	<4.55	<4.18	<4.40	<4.30	<2.05	6.37	<4.38	<4.61	2.98	<4.48	<2.07	<4.58	<2.02	<4.54	<2.01
PFOA	12	<4.2	<4.33	15.6	61.7	24.3	5.8	14.0	12.9	2.9	35	40.8	23.5	20.7	<4.48	<2.07	<4.58	<2.02	4.63	8.05
PFNA	11	<4.2	<4.33	<4.24	<4.55	<4.55	<4.18	<4.40	<4.30	<2.05	54.9	4.79	<4.61	2.63	<4.48	<2.07	<4.58	<2.02	<4.54	<2.01
PFOS	15	<4.2	<4.33	<4.24	<4.55	<4.55	<4.18	10.9	15.8	<2.05	6.19	44.8	44.9	26	<4.48	<2.07	<4.58	<2.02	5.71	18.2



GPC 2024 UIC Conference

Questions