

# Complexities of PFAS Treatment in Surface Water

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# Current Focus on Groundwater PFAS Treatment

**Compared to Surface Water, Groundwater typically has**

- Lower TOC concentrations (<1 mg/L)
- Less variability in WQ and PFAS concentrations
- Lower flowrates



# Case Studies to Highlight

## Surface Water Pilot-Scale Study



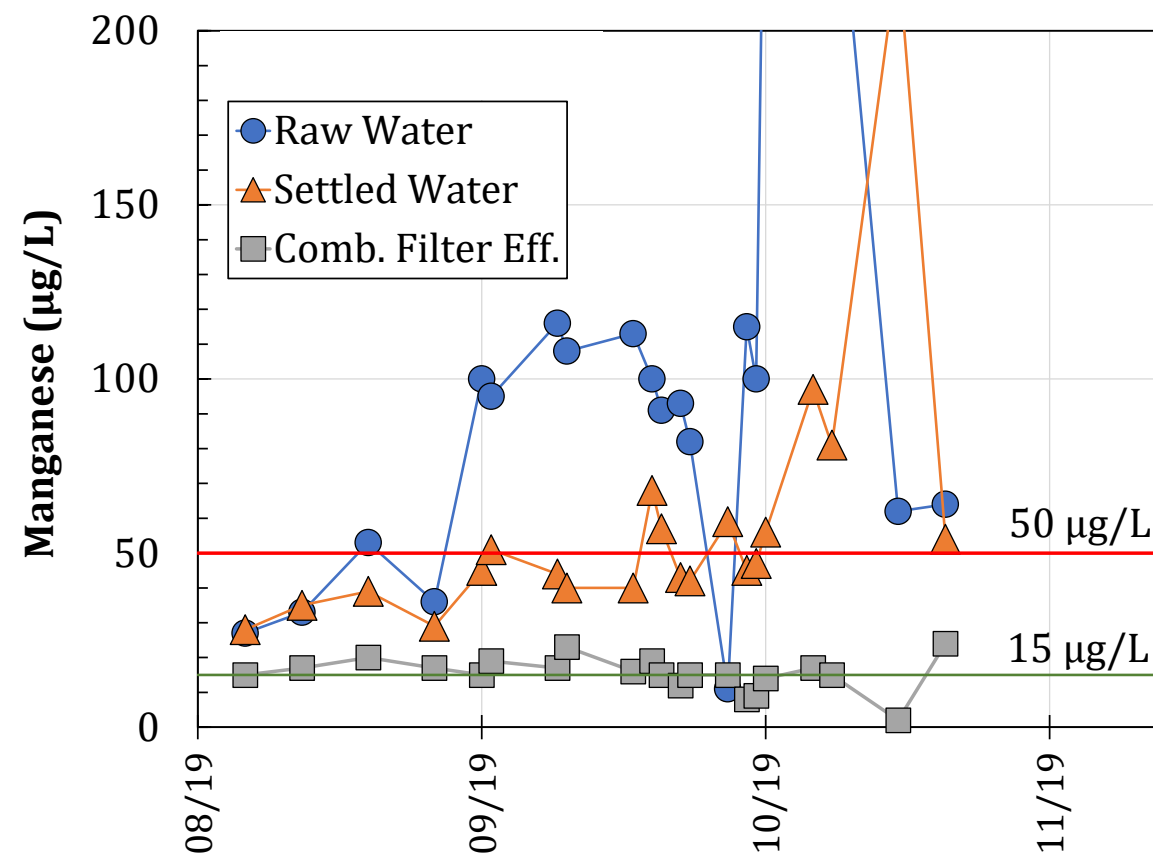
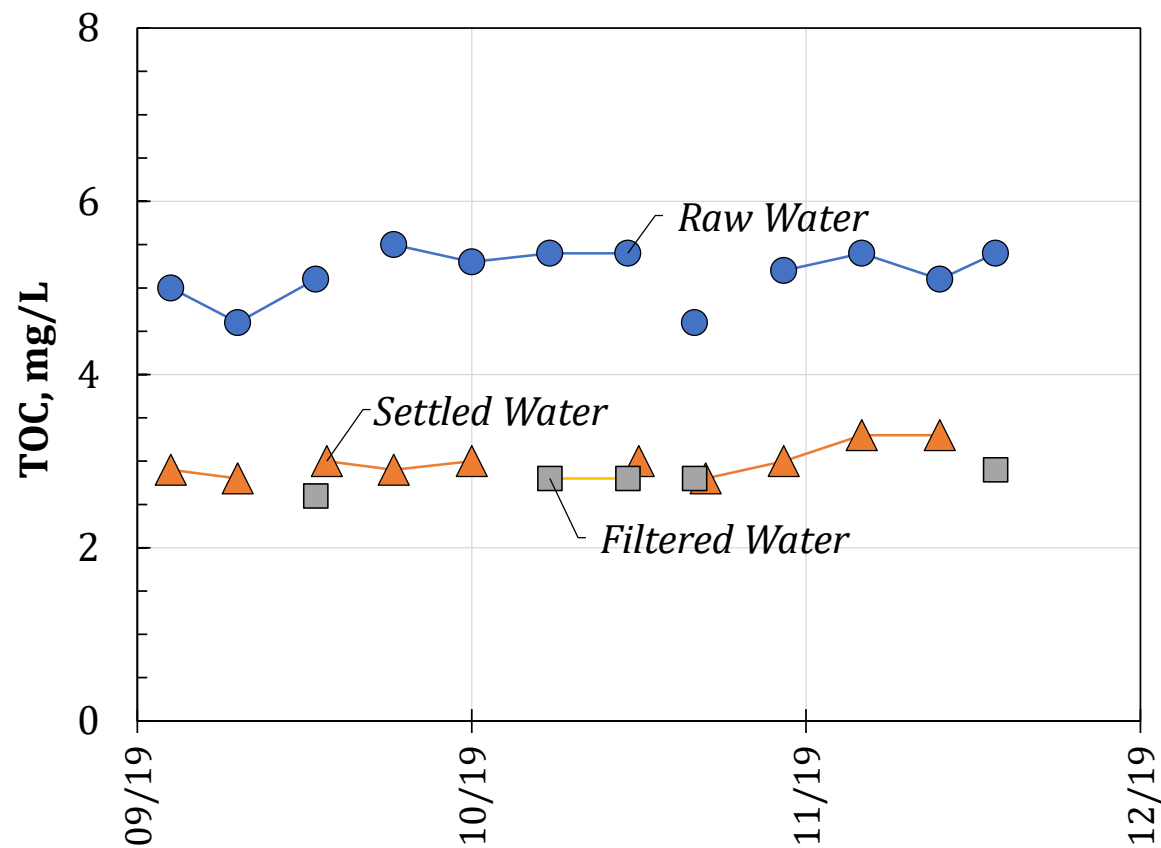
# Water Quality and Process Selection

Abbreviation	Average (ng/L)	Range (ng/L)
PFOA	25	24 – 26
PFOS	15	14 – 16
PFBS	12	8.8 – 14
PFDA	5.8	5.0 – 6.6
PFHpA	9.9	8.1 – 11
PFHxS	8.6	8.0 – 9.1
PFHxA	21	16 – 24
PFNA	5.1	4.7 – 5.3

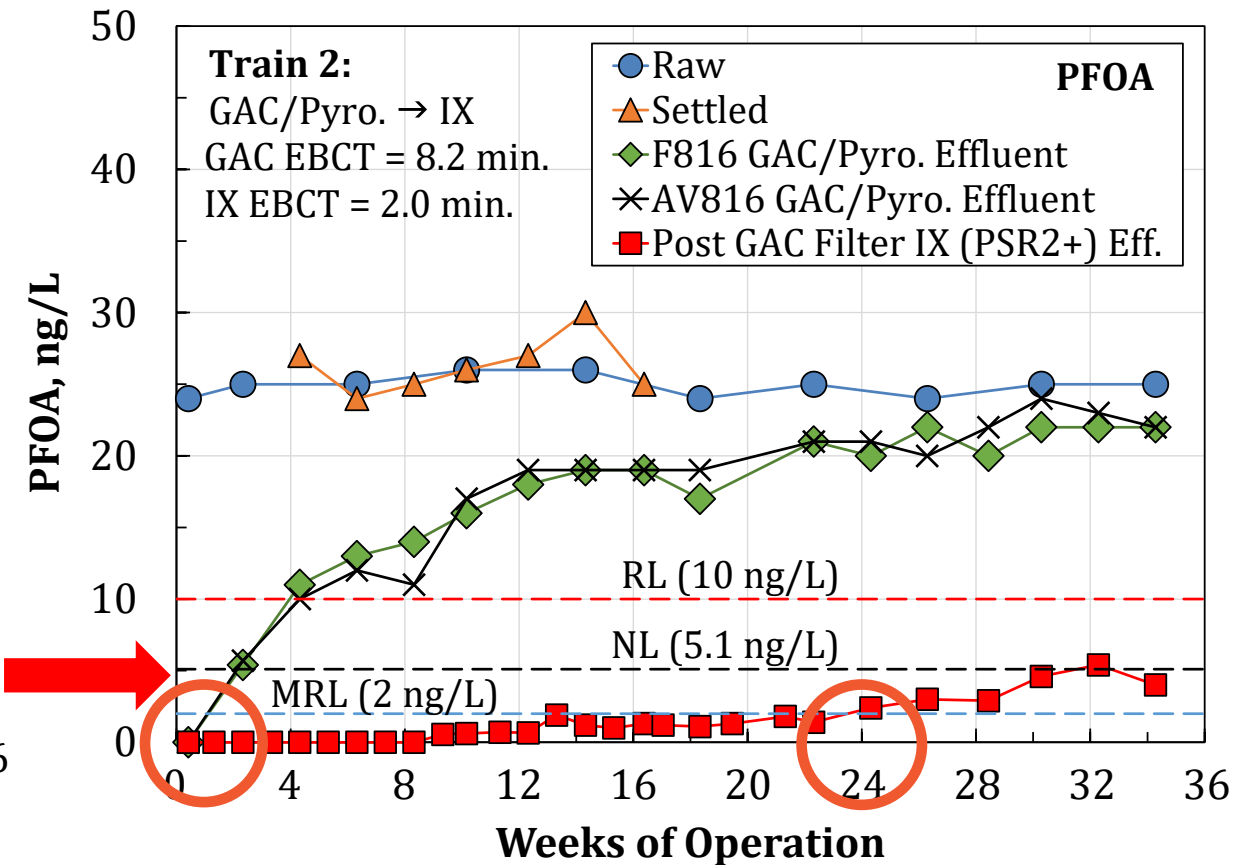
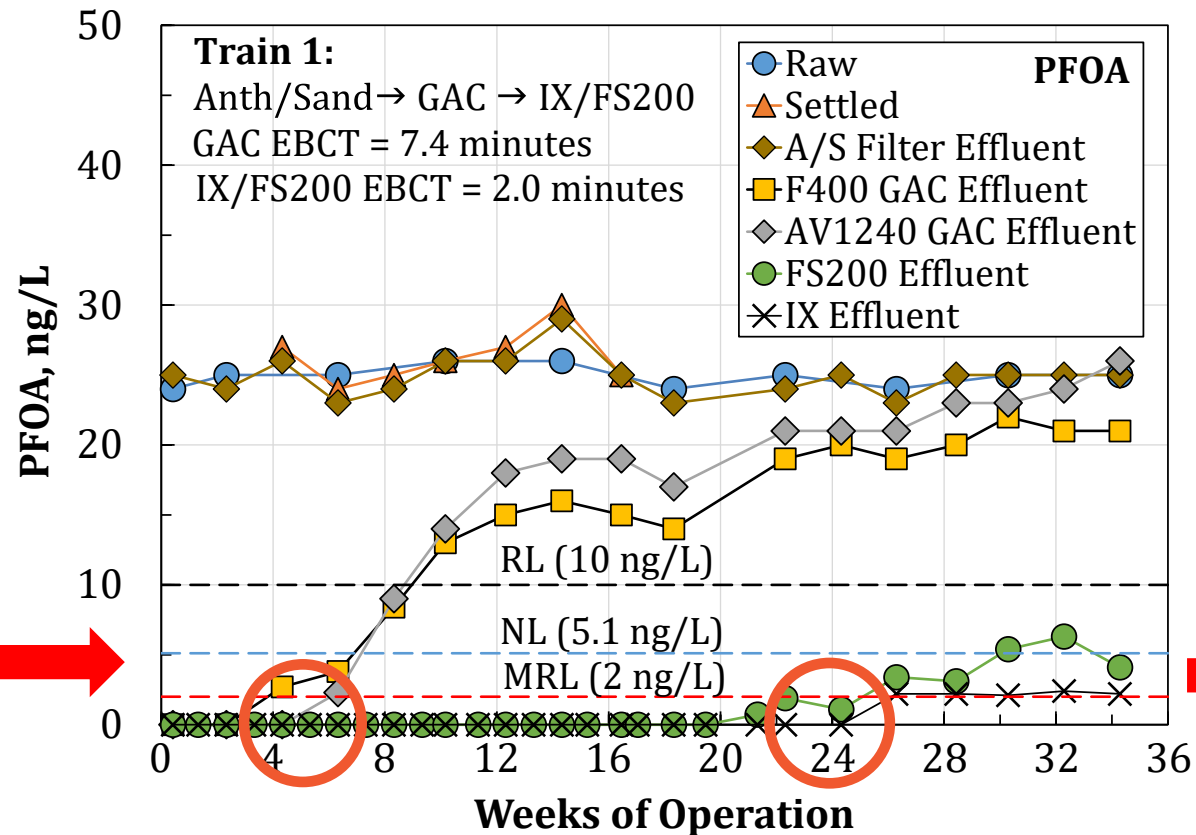
## Treatment Goals:

- ✓ PFAS
- ✓ TOC
- ✓ DBP, T&O
- ✓ Manganese

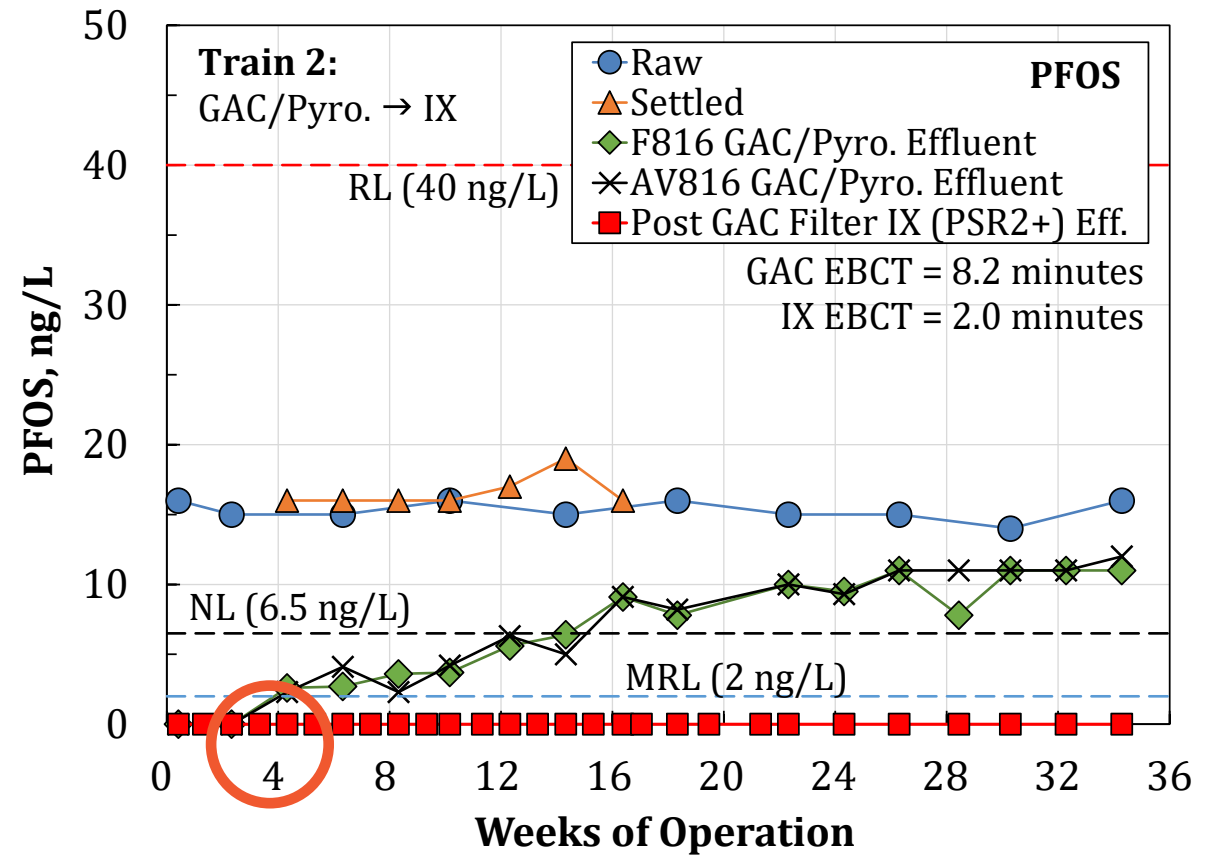
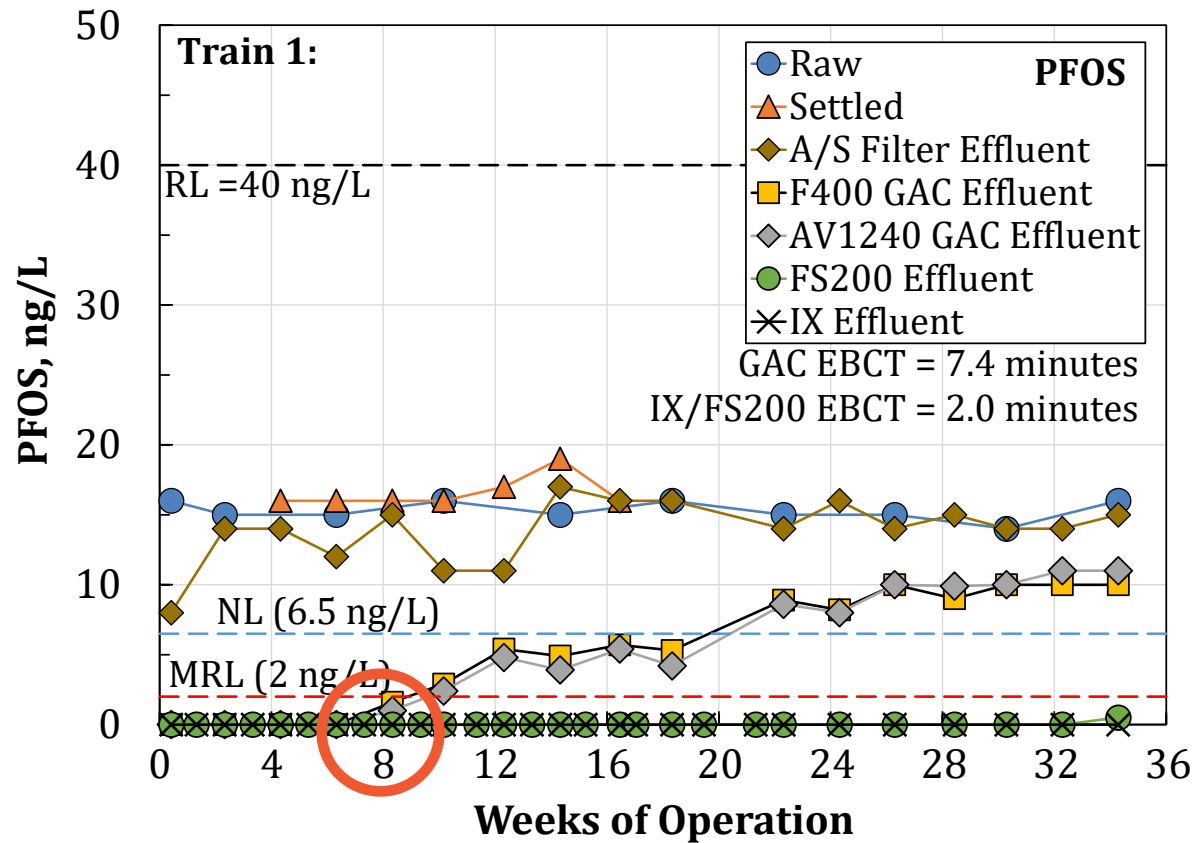
# Surface Water Quality



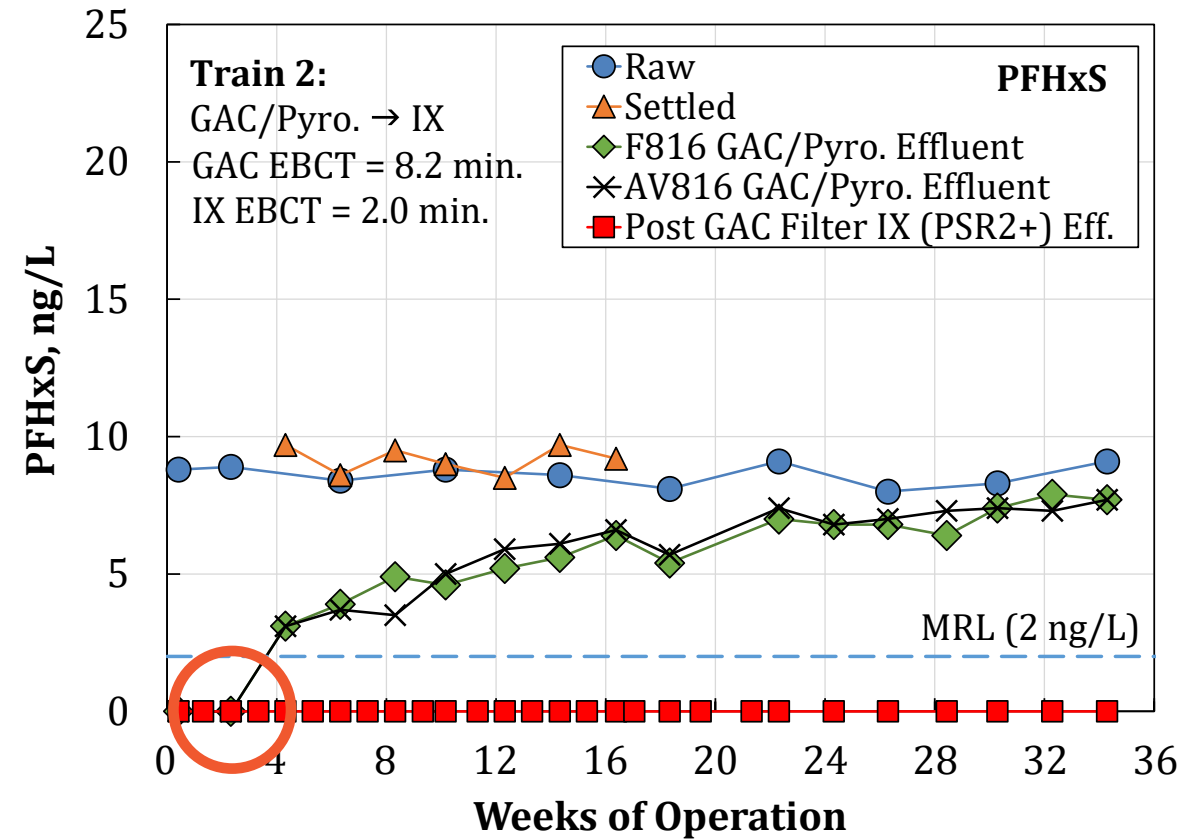
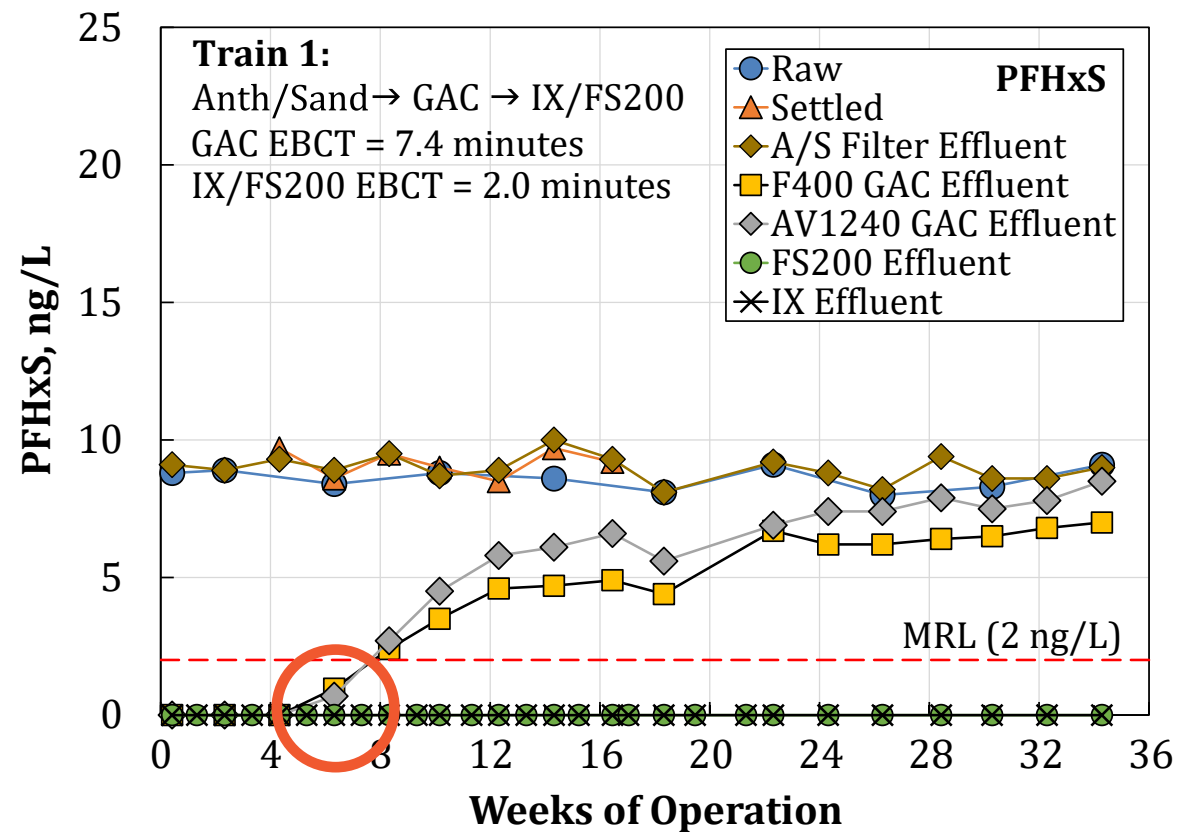
# Trains 1 and 2 – PFOA



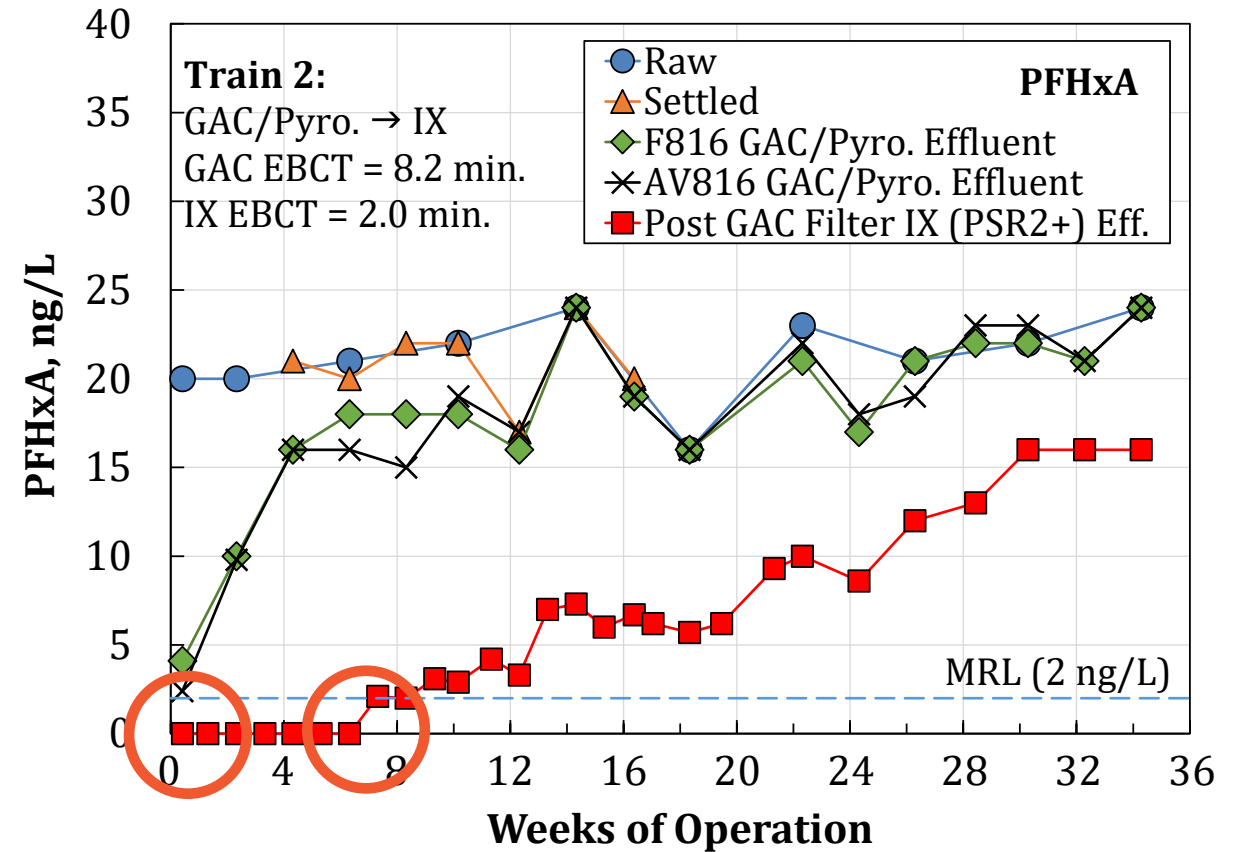
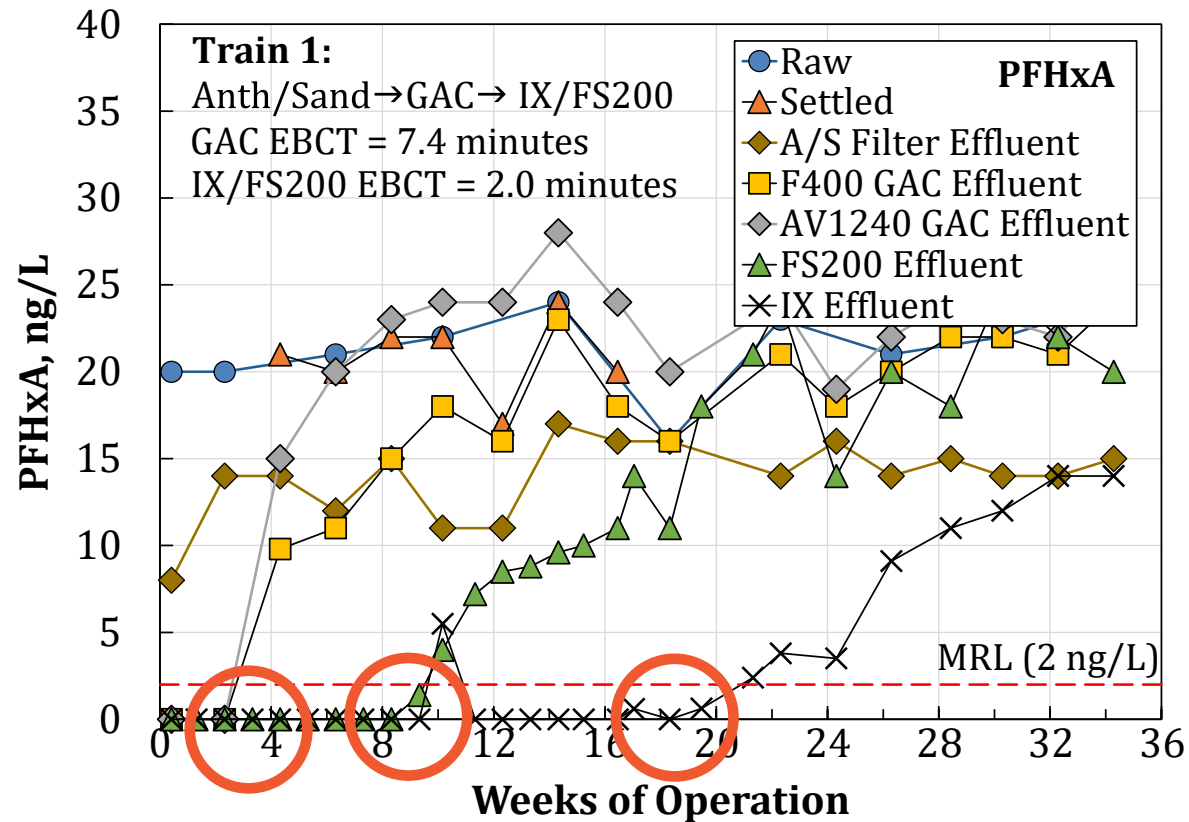
# Trains 1 and 2 – PFOS



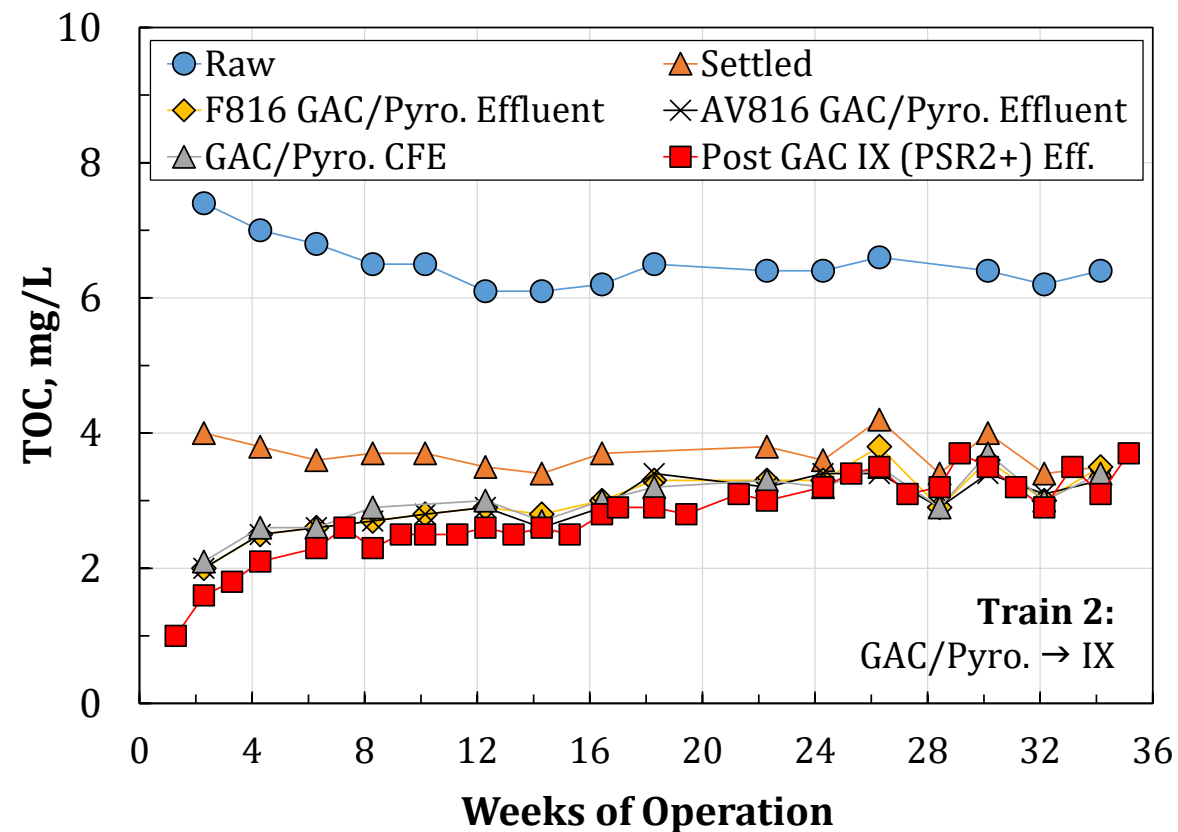
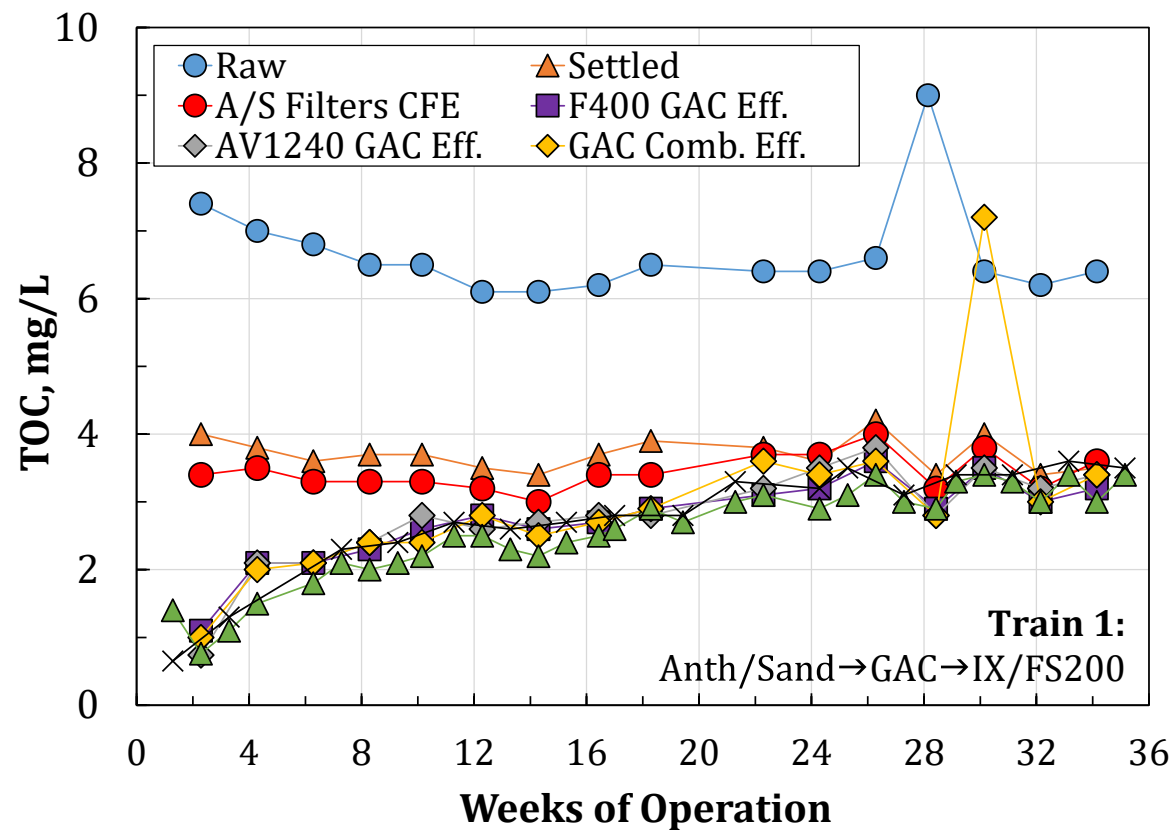
# Trains 1 and 2 – PFHxS



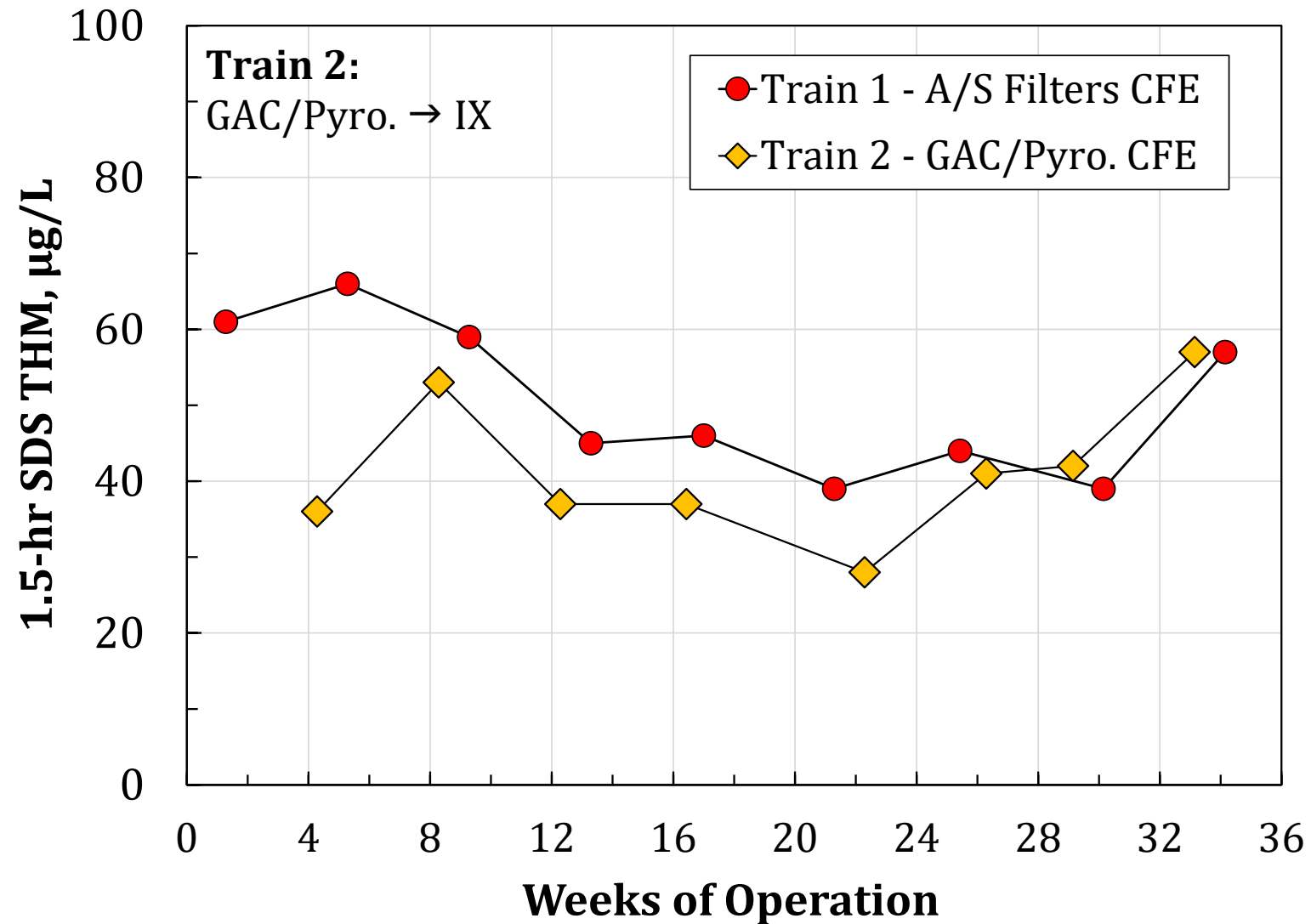
# Trains 1 and 2 – PFHxA



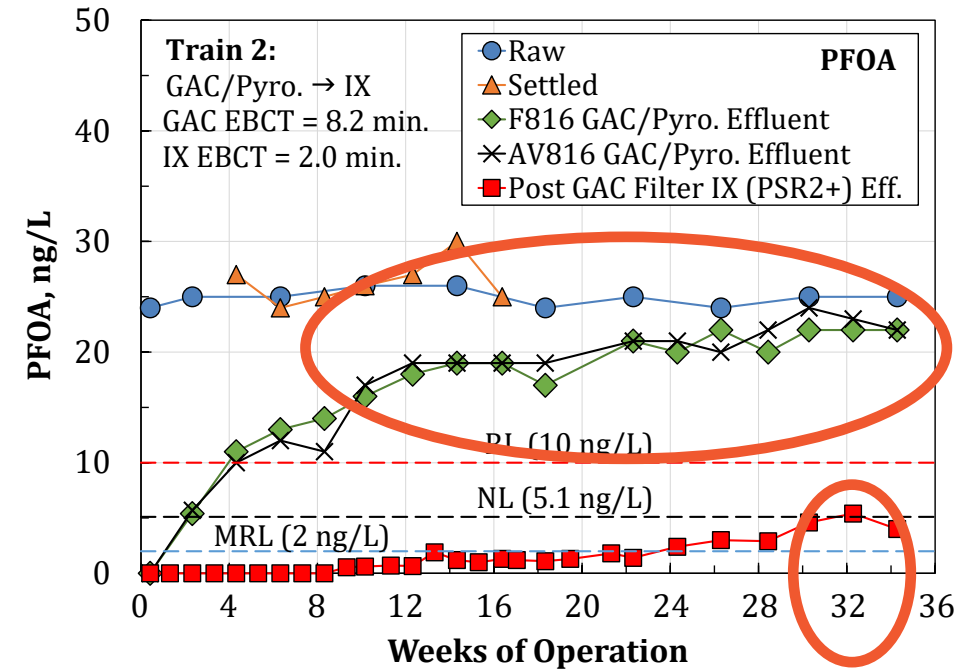
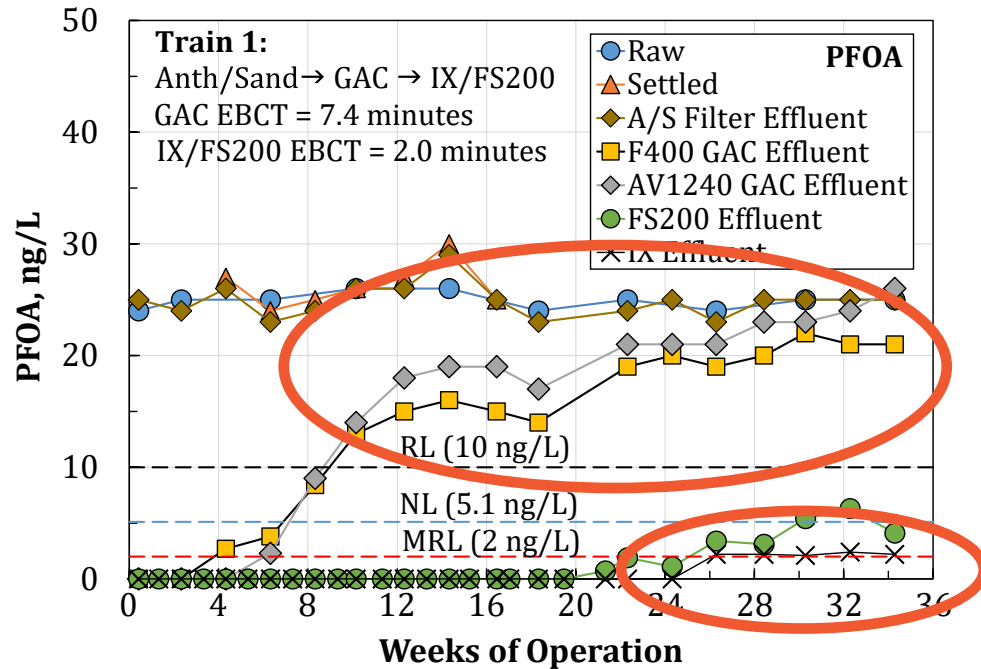
# TOC Removal



# TOC and DBP Removal – Train 2

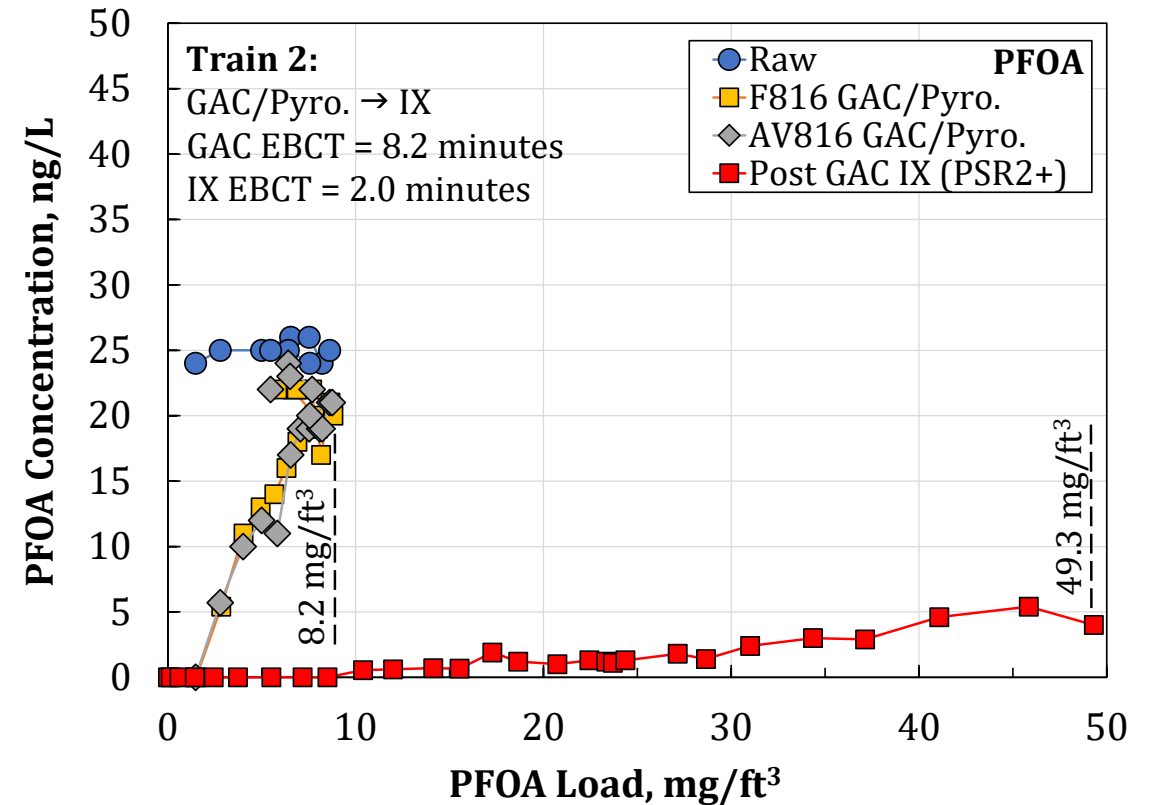
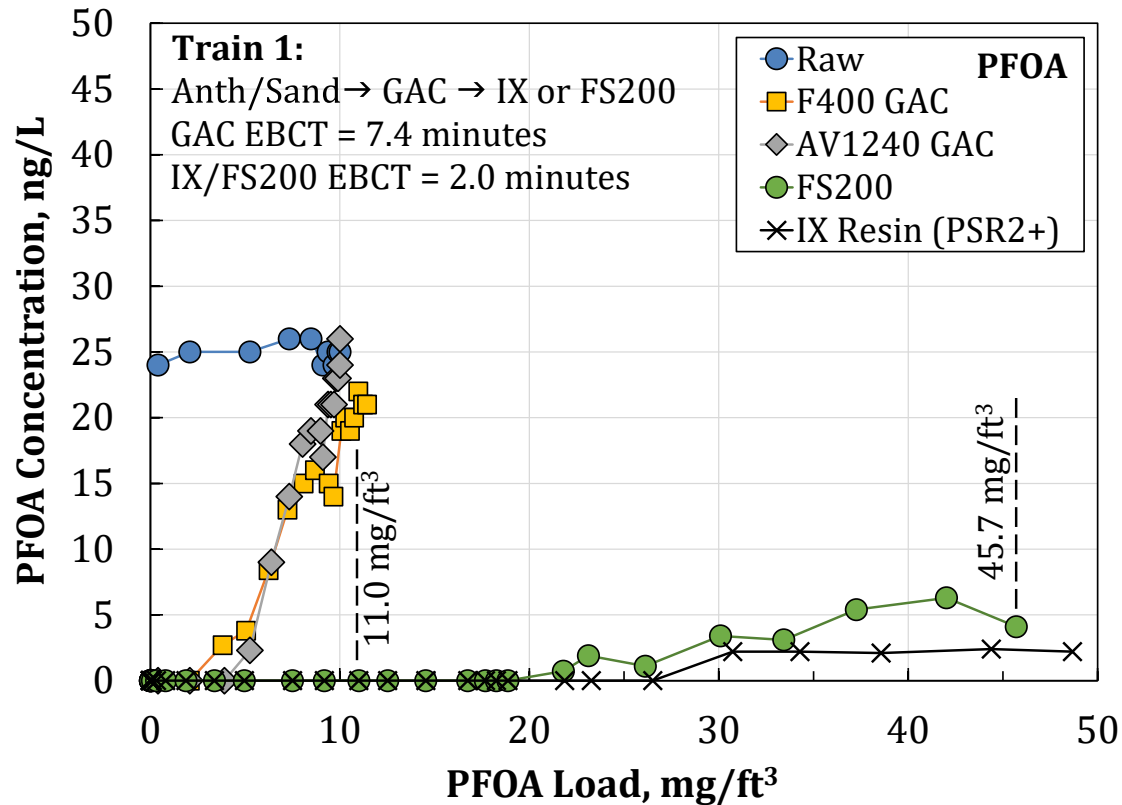


# Benefit of GAC followed by IX?



- Site specific – TOC, DBP, T&O removal benefits
- Potentially ‘optimize’ by using the entire GAC adsorption capacity
- GAC removal of PFOA mass reduces IX loading
- Practical operational challenges with GAC → IX, especially with media changeout timing

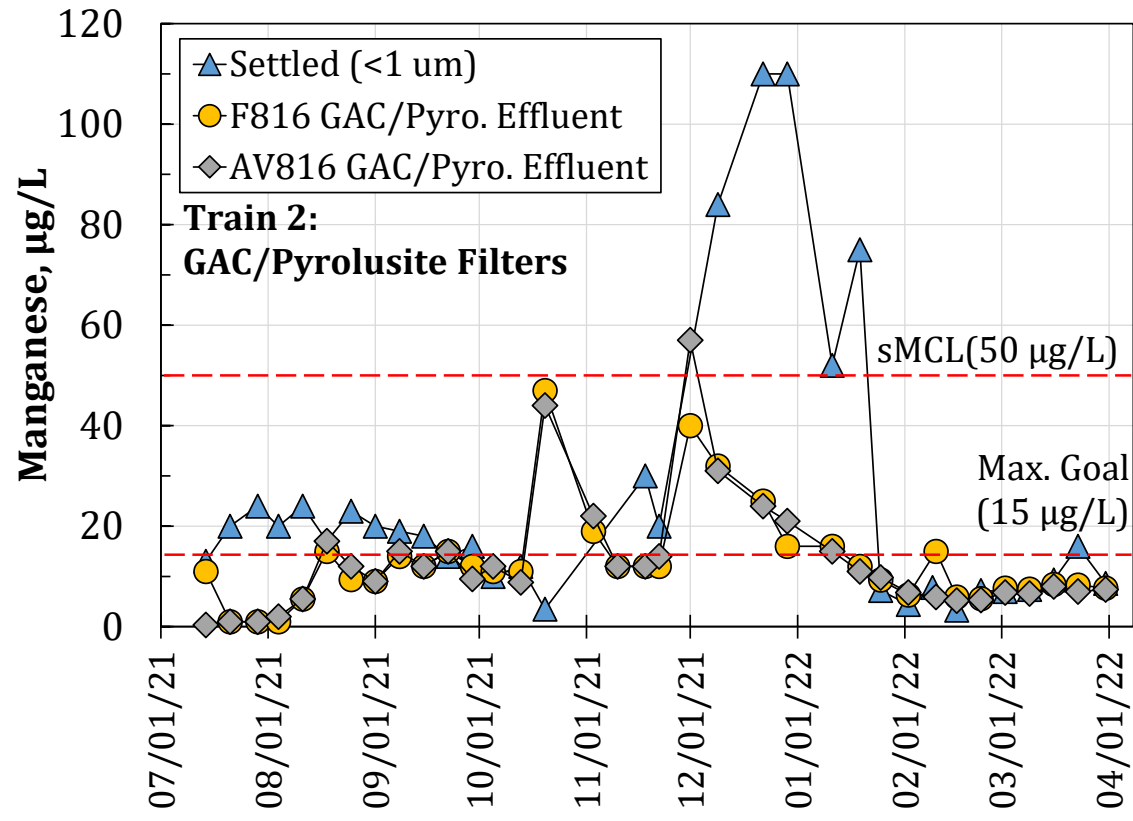
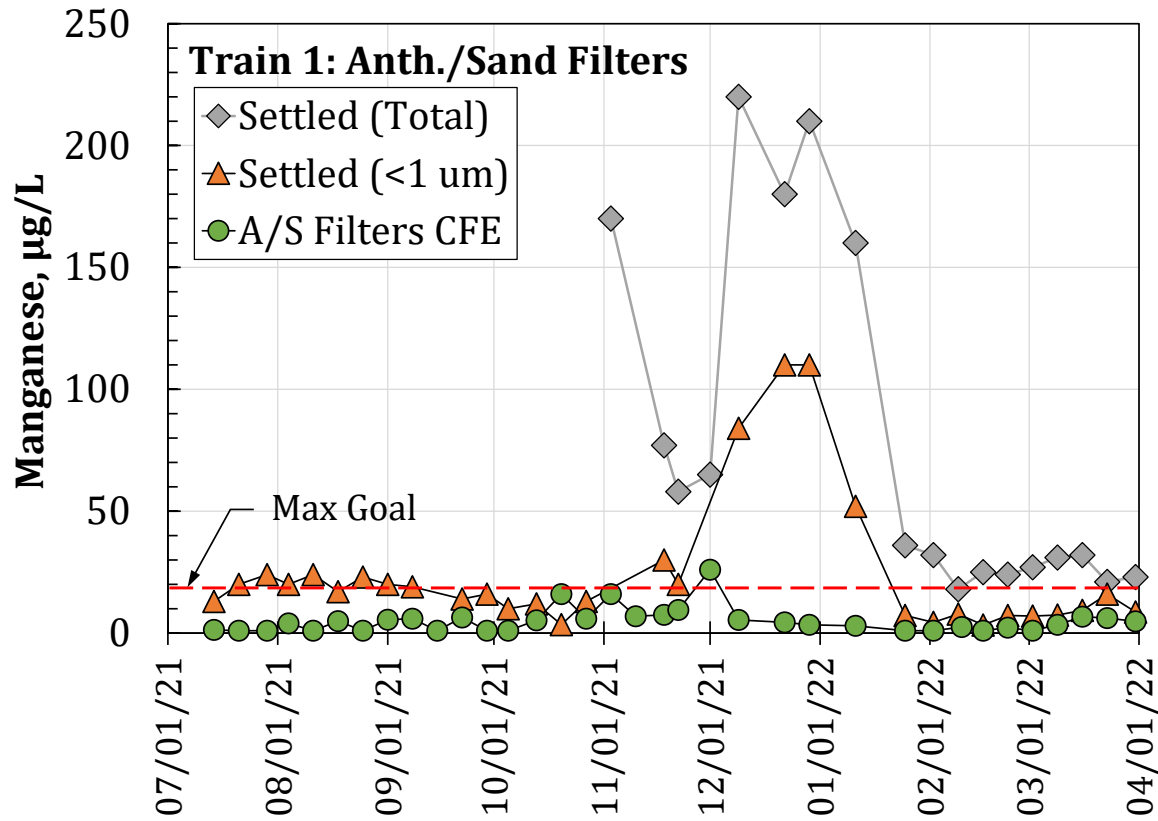
# Media Mass Load



GAC: 11 mg/ft³ (Train 1) | 8.2 mg/ft³ (Train 2) – Other GW systems > 78 mg/ft³

IX: 45.7 mg/ft³ (Train 1) | 49.3 mg/ft³ (Train 2) – Other GW systems > 73 mg/ft³

# Manganese Removal



Q & A

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