



September 21, 2020

*North Carolina Department of Environmental Quality
Division of Water Resources*



General Discussion

15A NCAC 02L .0202 GROUNDWATER QUALITY STANDARDS

Permission to proceed to Public Notice and Hearings on Amendments

Triennial Review

Neuse Watershed Modeling

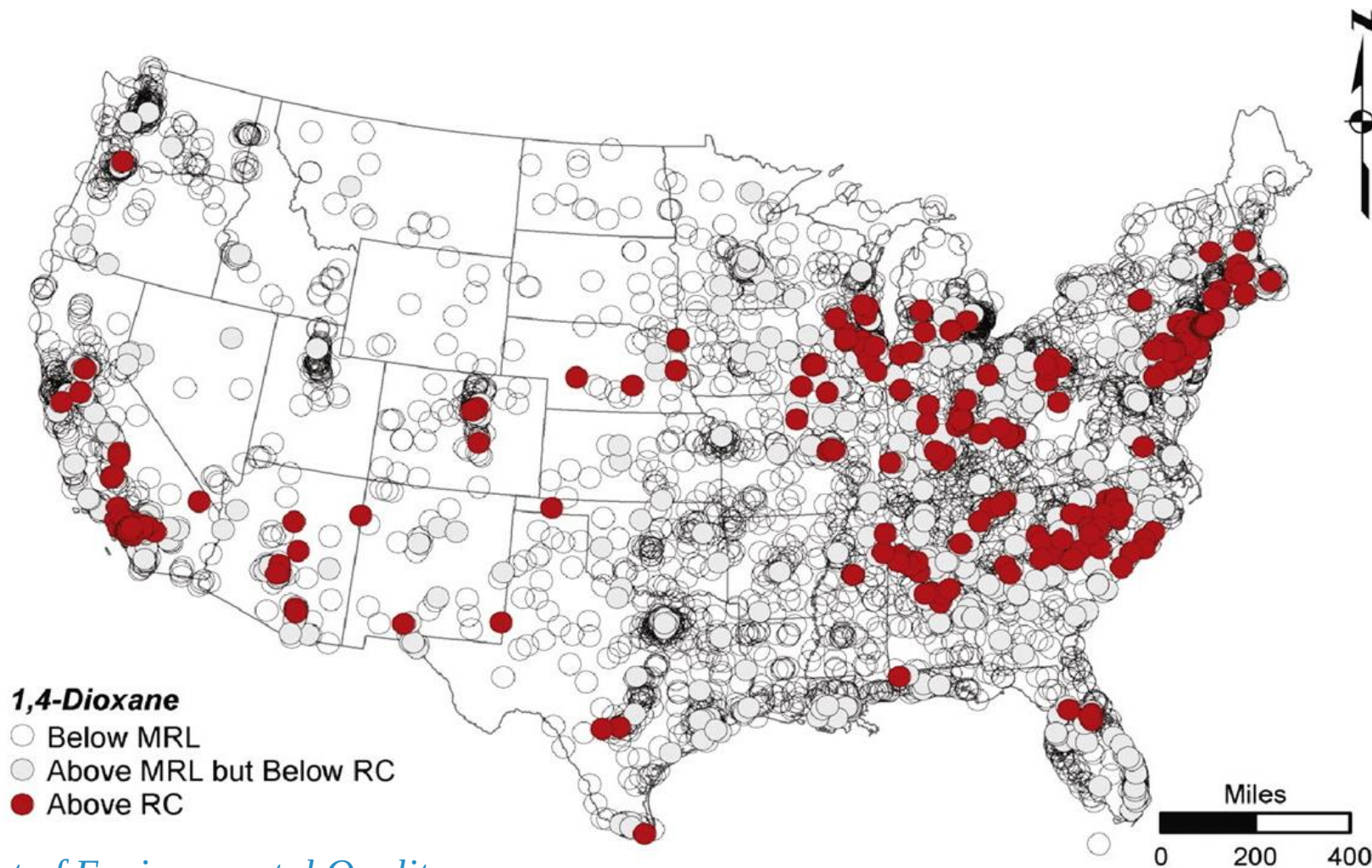
DWR Review of North Carolina Policy Collaboratory Jordan Lake Study

Chemours

Emerging Compounds



1,4-Dioxane data from UCMR3



1,4 dioxane detected in 21% of the 4864 public water systems tested.

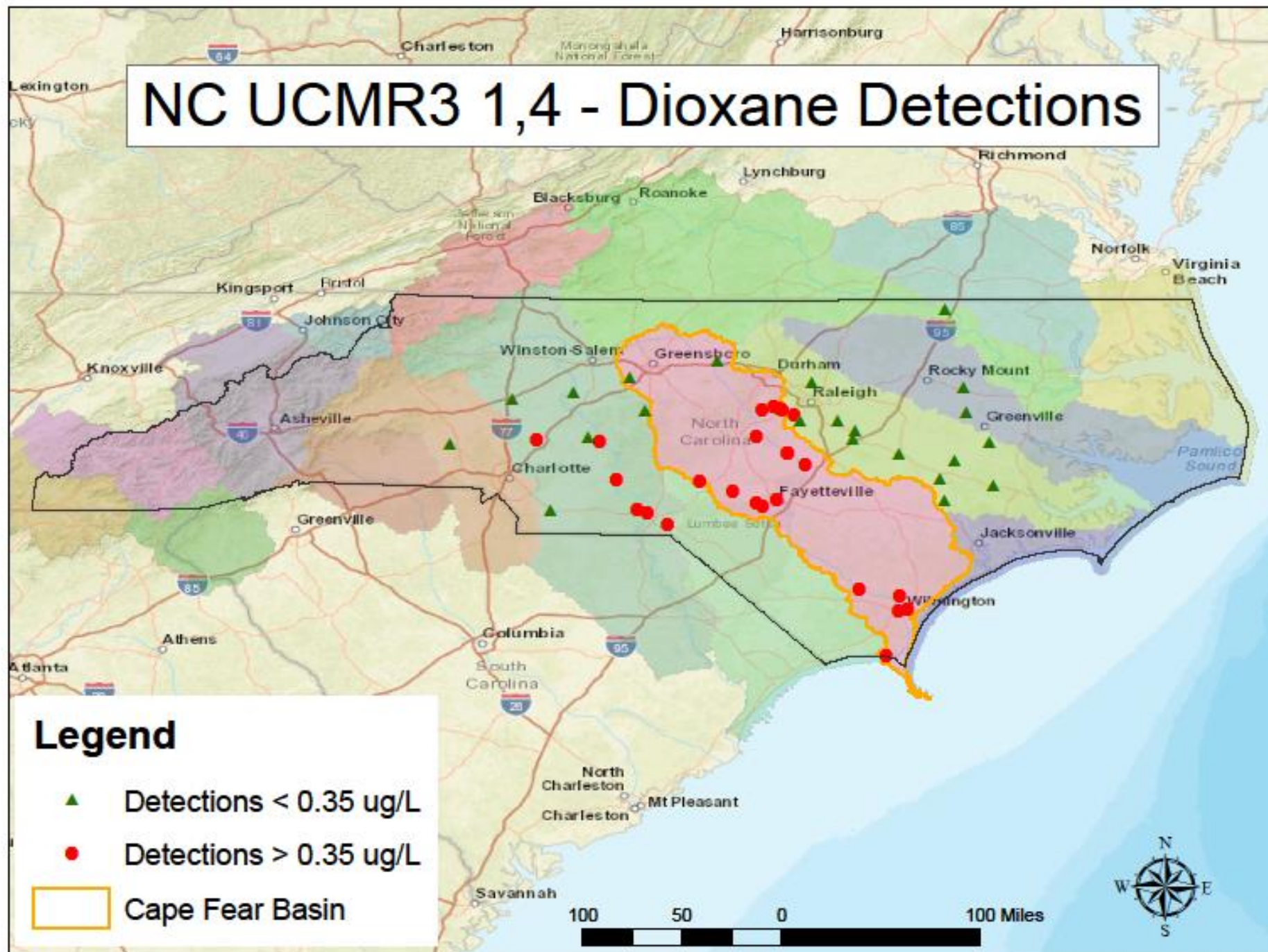
6.9% greater than 0.35 ug/L which is a human health criteria based on 1 in 1 million cancer risk

NC had top 4 surface water detections in country

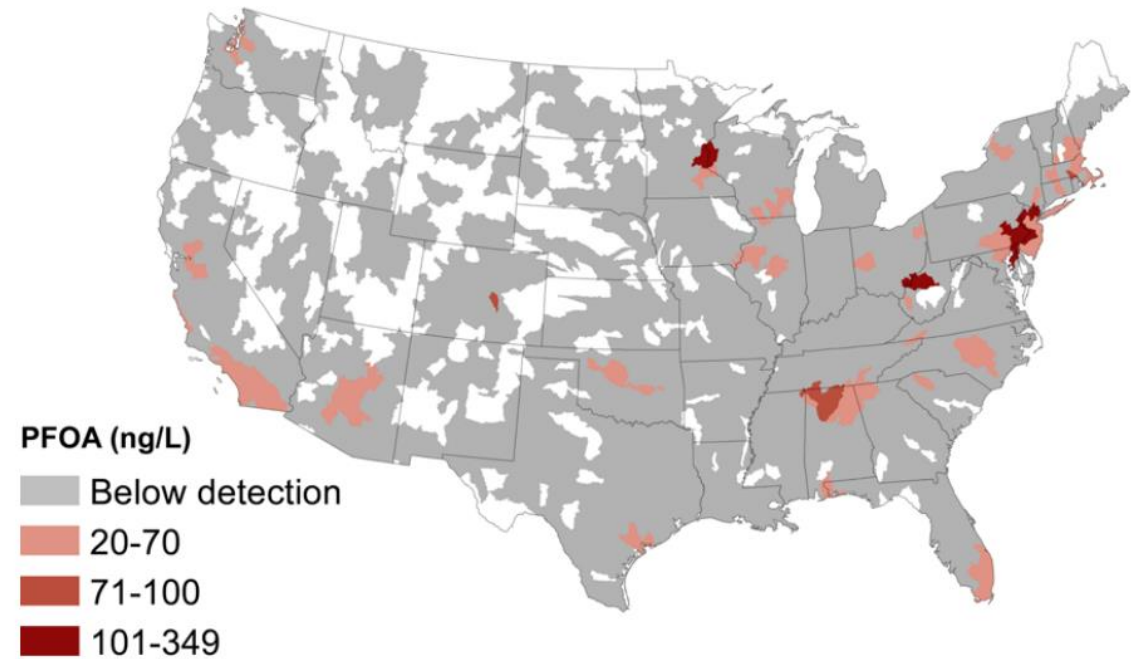
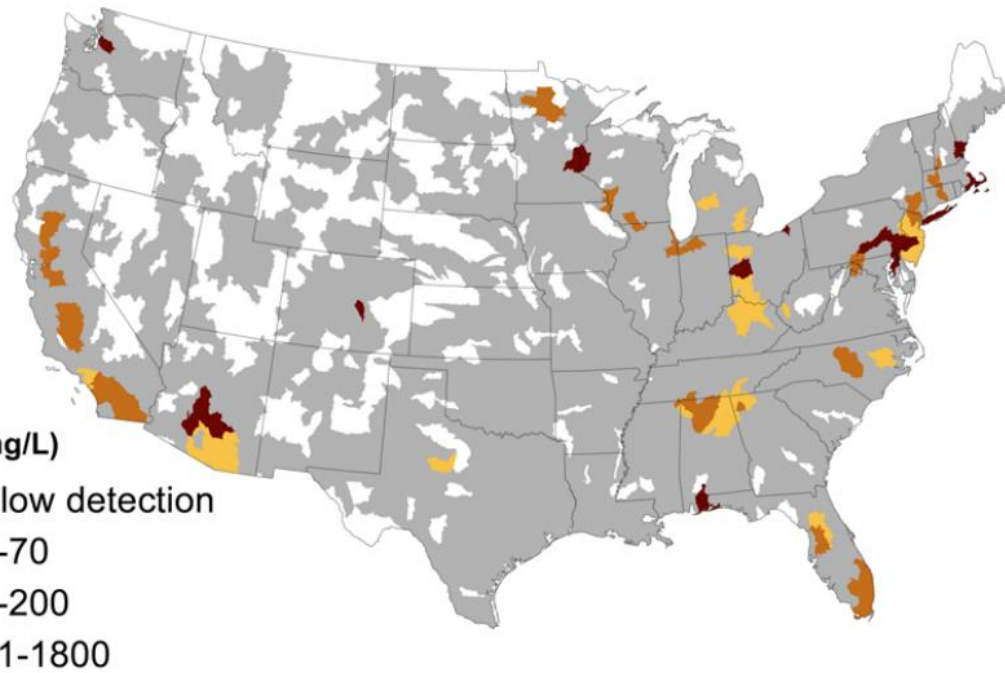
*Pic from: 1,4-Dioxane drinking water occurrence data from the third unregulated contaminant monitoring rule



NC UCMR3 1,4 - Dioxane Detections



PFAS data from UCMR3

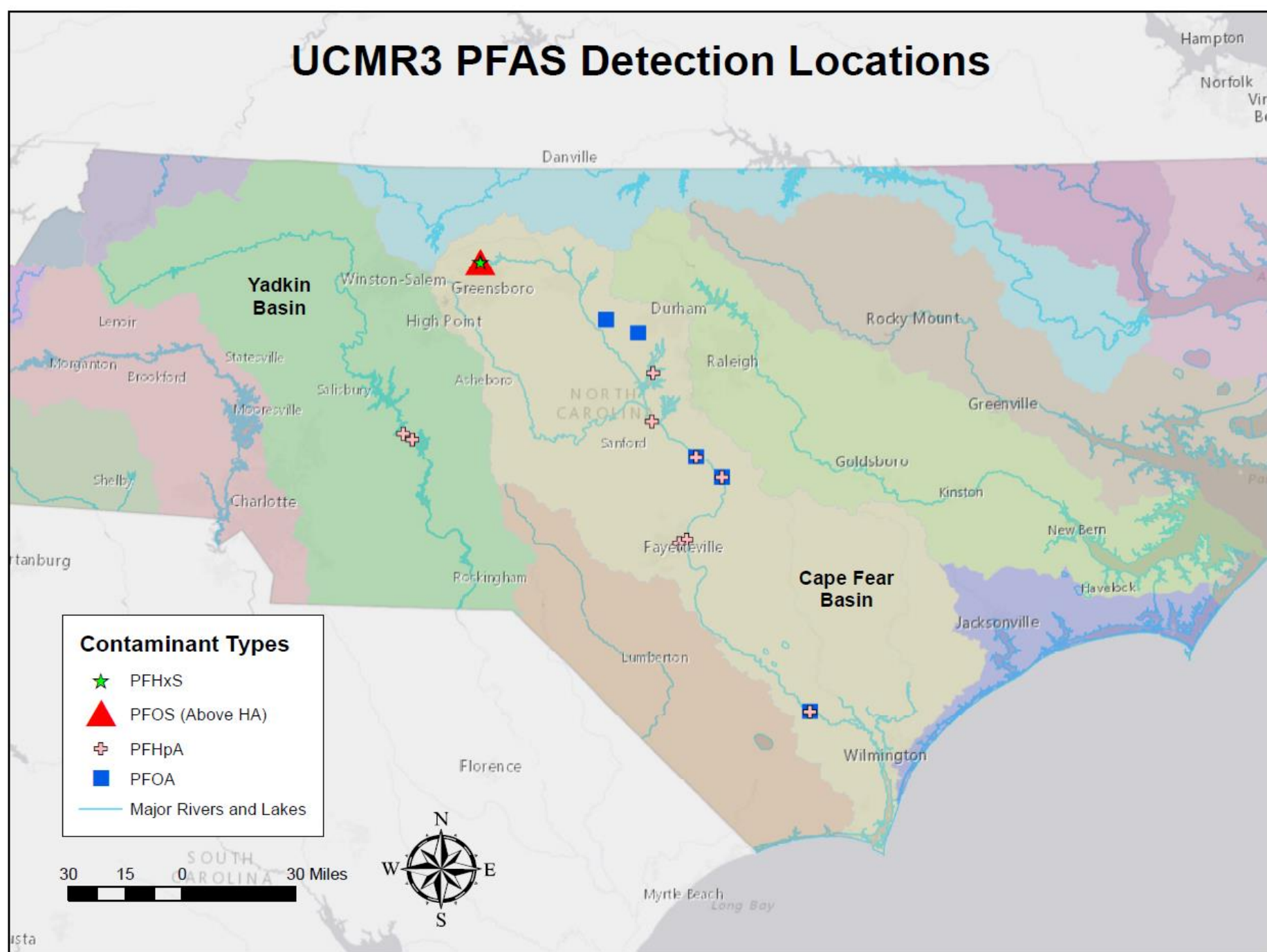


*Pic from: Detection of Poly- and Perfluoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Wastewater Treatment Plants

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UCMR3 PFAS Detection Locations



Identify Compounds of Concern

Unregulated Contaminants Monitoring Rule (UCMR)

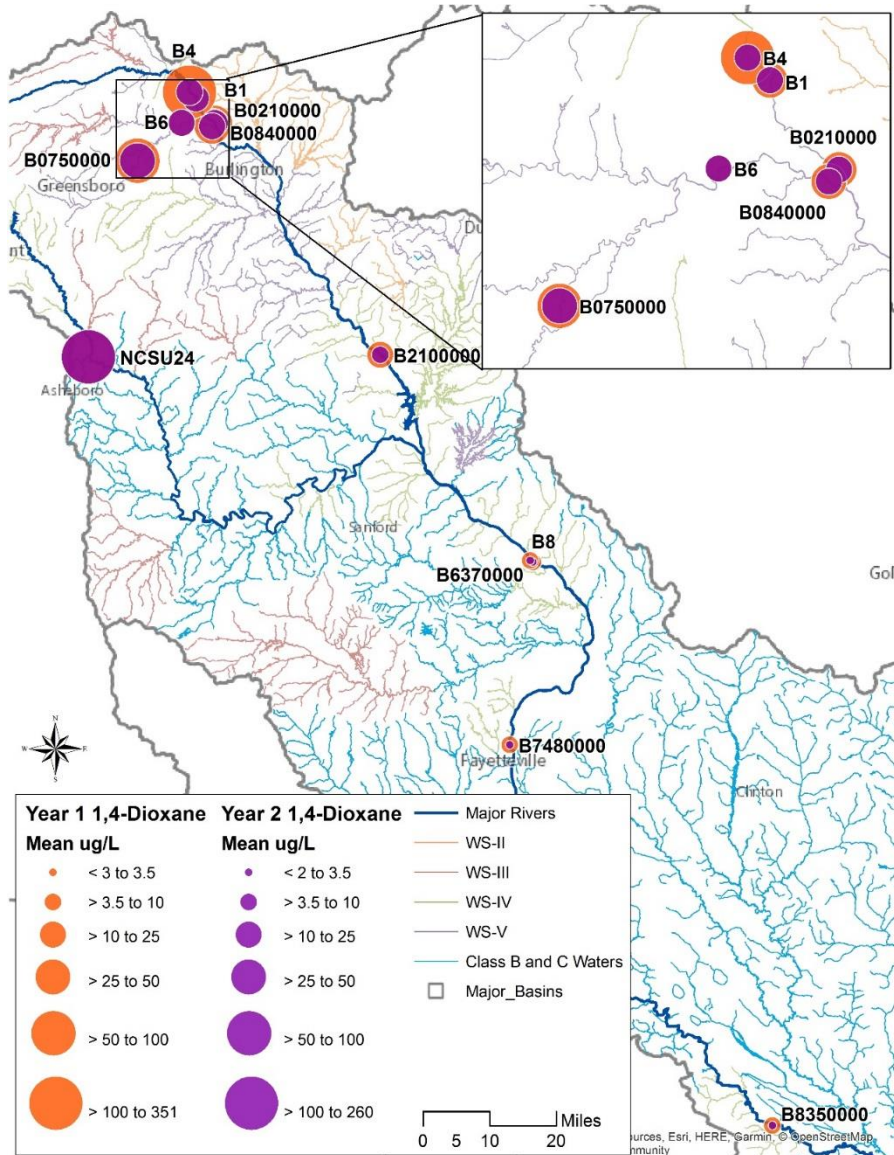
- EPA collects data for chemicals and microbes that may be present in drinking water, but are not currently subject to EPA drinking water regulations
- UCMR3 (2012-2016) indicated elevated levels of PFAS and 1,4-dioxane in the Cape Fear River Basin

DWR Ambient Monitoring for 1,4-Dioxane in the Cape Fear River Basin

- Ongoing screening of various stations throughout the Cape Fear River Basin
- 2014 – 2016 screening results consistent with UCMR3

2018 DWR Emerging Compounds Reports

- [B. Everett Jordan Reservoir and its immediate watershed](#)
- [Falls Lake and its immediate watershed](#)
- [various public water supply \(PWS\) reservoirs in the Cape Fear, New and Watauga River Basins.](#)



- DWR conducted a 2-year study to find sources of 1,4-dioxane in the Cape Fear river basin
- Based on results, Upper Piedmont permittees requested to evaluate sources and reduce 1,4-dioxane in discharge
- Additional sampling has been expanded to include other river basins



Stage 1 - Complete

- ✓ Identify compounds of concern
 - ✓ Look into UCMR
 - ✓ Conduct Statewide Ambient Monitoring
 - ✓ Identify basins of concern
- ❑ Identify dischargers/sources of these compounds
- ❑ Address steps toward minimizing compound discharge



The Cape Fear River Basin has:

- 34 Major Municipal dischargers (> 1.0 MGD)
- 20 Minor Municipal dischargers (< 1.0 MGD)
- 50 Industrial dischargers
- 6 Groundwater Remediation sites

**Not all of these facilities are discharging these compounds.
How do we focus the sampling on the likely dischargers?**

Identifying sources –Industrial Dischargers



EPA's Toxic Release Inventory (TRI)

- Tracks the management of chemicals in certain industry sectors that manufacture, process, or otherwise use these chemicals in amounts above established levels
- Compiled Standard Industrial Codes (SICs) associated with compounds of concern across the country
- Compared SICs of Industrial permit holders across the Cape Fear River Basin
- Selected potential industrial sources

Published Literature and Technical Documents

- Other states and agencies also deal with these compounds
- Found resources from these other groups regarding how they identify sources

Identifying sources – Municipalities



Municipal facilities with pretreatment programs

- Emerging compounds are not generated at WWTPs
- Focus on municipalities that accept industrial contributions to their wasteflows



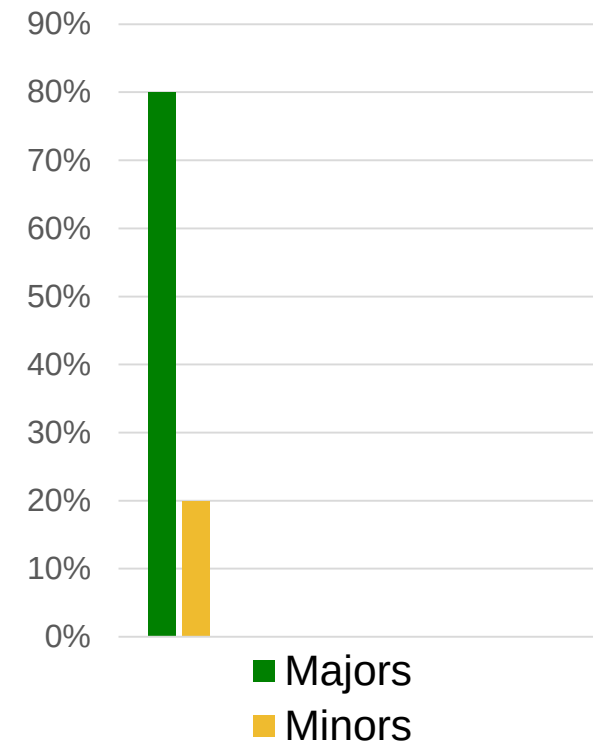
NPDES Wastewater Permitting



Types of Wastewater Permits Issued

- Majors - 216 Total
 - Municipal - 157
 - Industrial - 59
- Minors - 891 Total
 - Municipal - 123
 - Industrial - 142
 - 100% Domestic
 - Groundwater Remediation
 - Water Treatment Plants
- Authorizations to Construct (ATC)
 - Issued ~36 ATC permits per year

Permitted Flow



Pretreatment Program

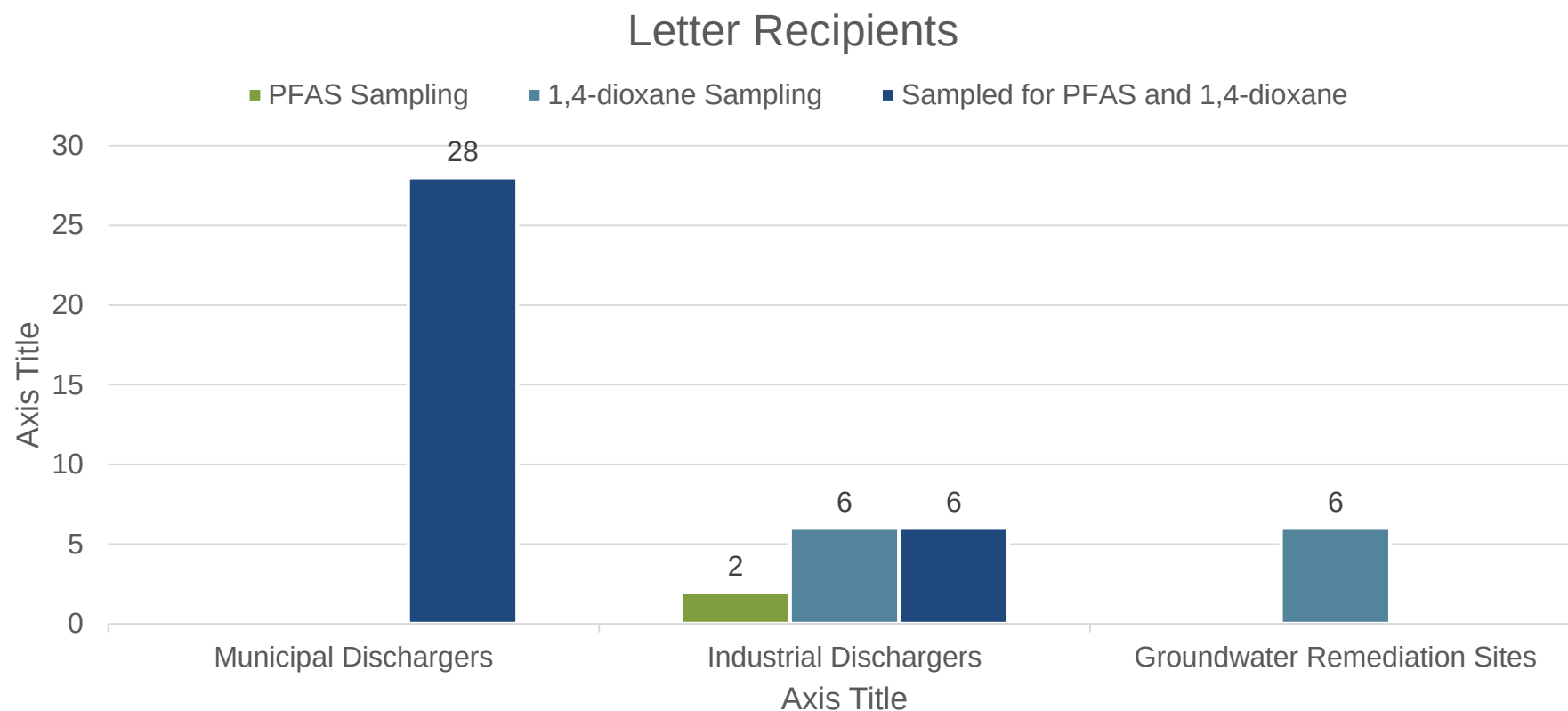
- **A SIU is an industrial user who:**
 - Discharges 25,000 gallons per day or more of process wastewater
 - Contributes 5% or more of the permitted flow or organic capacity (BOD, TSS, NH₃)
 - Is covered by federal categorical standards (e.g organic chemical manufacturing)
 - The control authority has determined has a reasonable potential to adversely impact the operation of the POTW
- **Comparison of NPDES Direct River Discharge vs. Pretreatment Program**
 - 59 Major Industrial NPDES Permits
 - 636 Significant Industrial Users in 114 different municipal Pretreatment Programs



Who's Sampling?



After cross-referencing SICs and pretreatment programs, letters requesting investigative monitoring were sent to:



Sampling Challenges

- As these compounds are unregulated, we do not always have an EPA-approved method of sampling for every matrix of concern (e.g. PFAS in wastewater)
- There are quality assurance concerns with using experimental or modified methods.

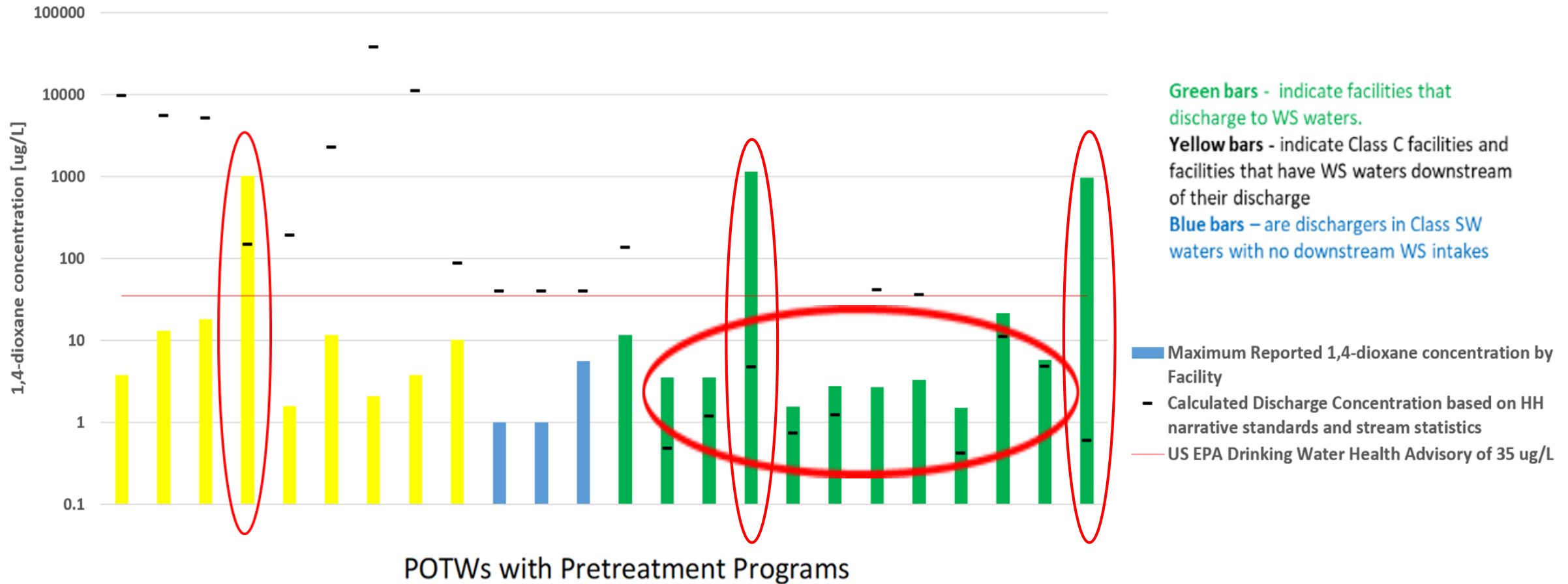




RESULTS



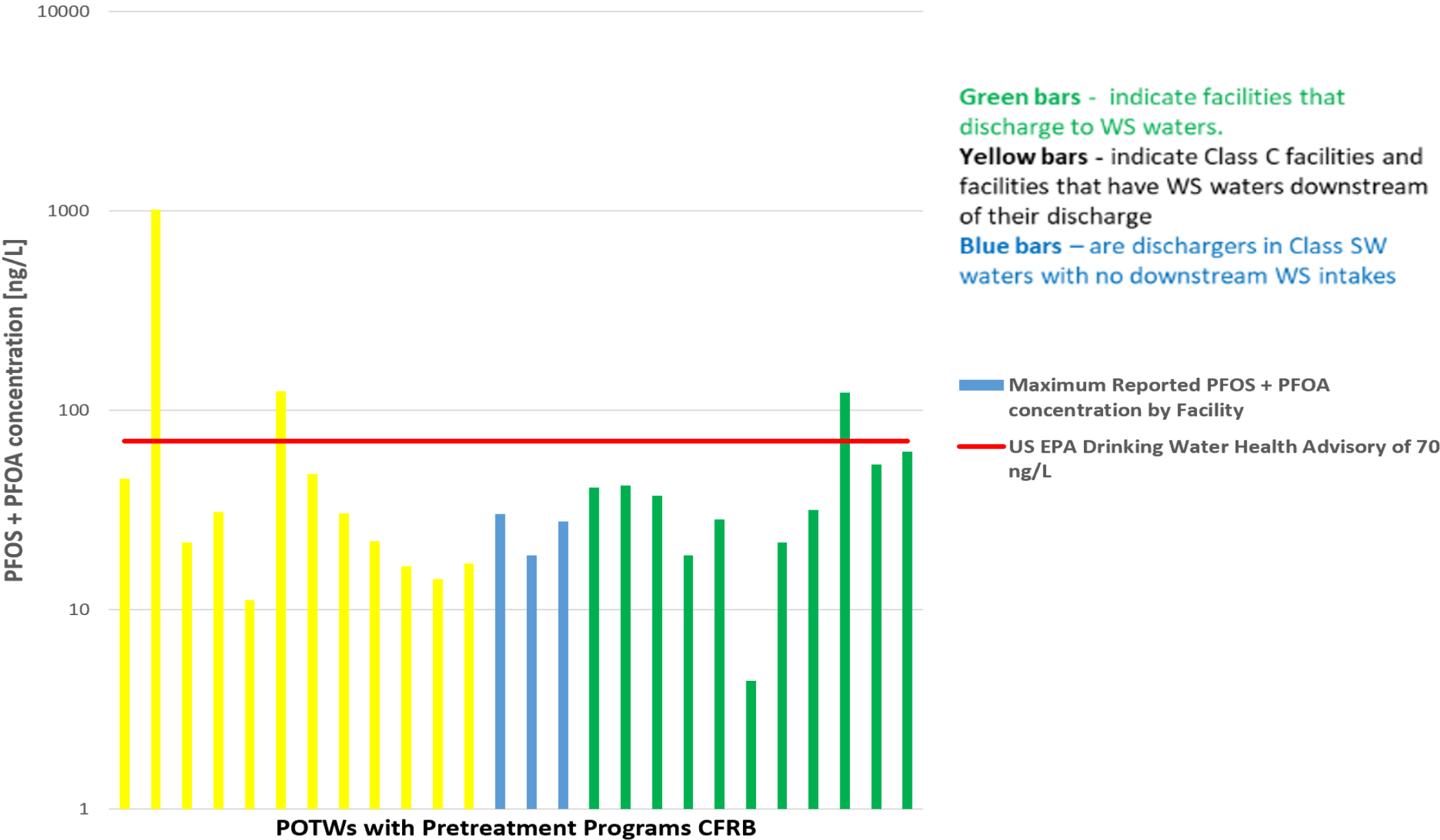
Maximum Reported 1,4-Dioxane Concentration by Municipal Facility



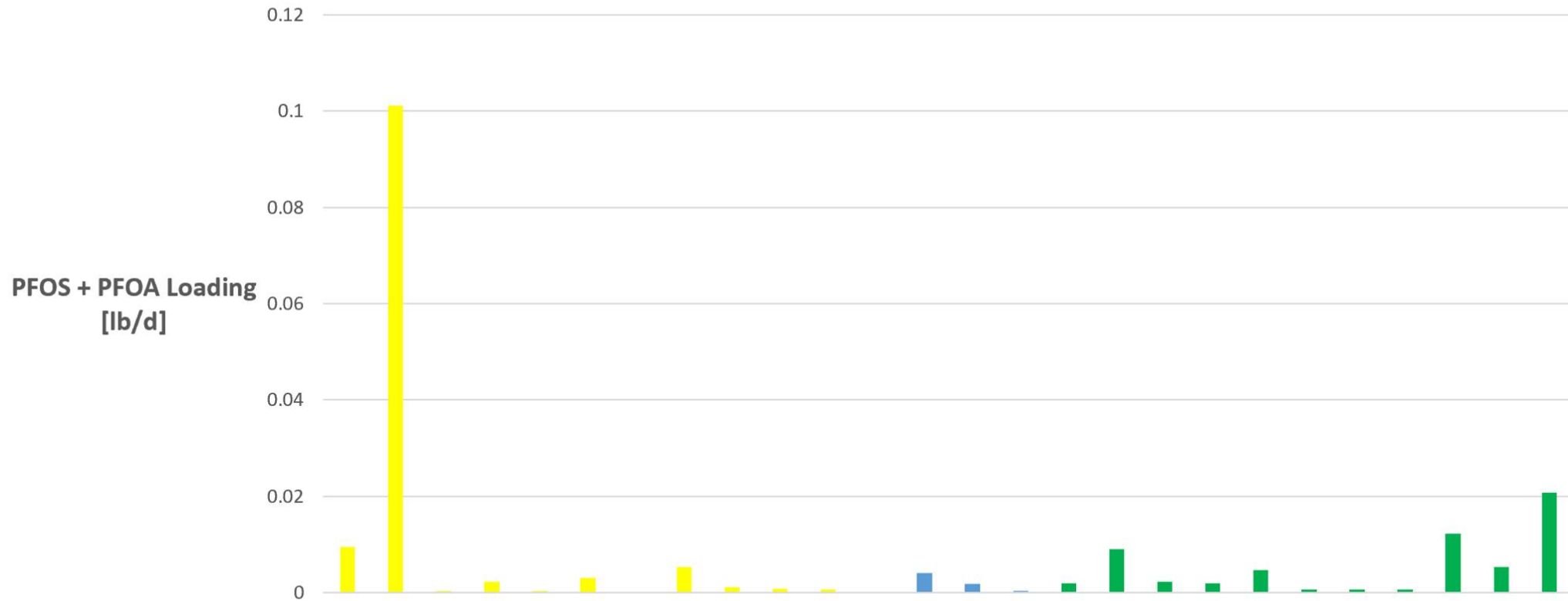
Maximum Reported 1,4-Dioxane Loading by Municipal Facility



Maximum Reported PFOS + PFOA Concentration by Municipal Facility



Maximum Reported PFOS + PFOA Loading by Municipal Facility



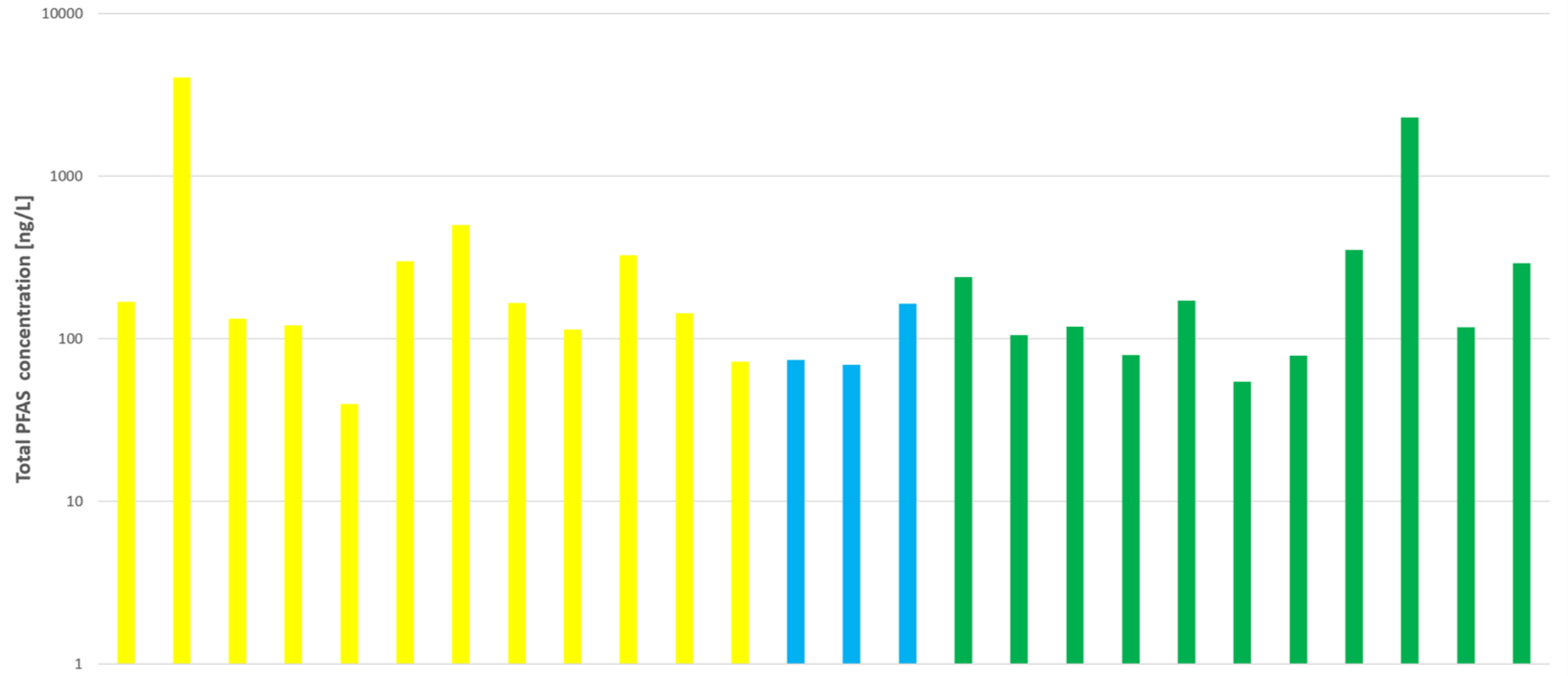
Green bars - indicate facilities that discharge to WS waters.

Yellow bars - indicate Class C facilities and facilities that have WS waters downstream of their discharge

Blue bars – are dischargers in Class SW waters with no downstream WS intakes

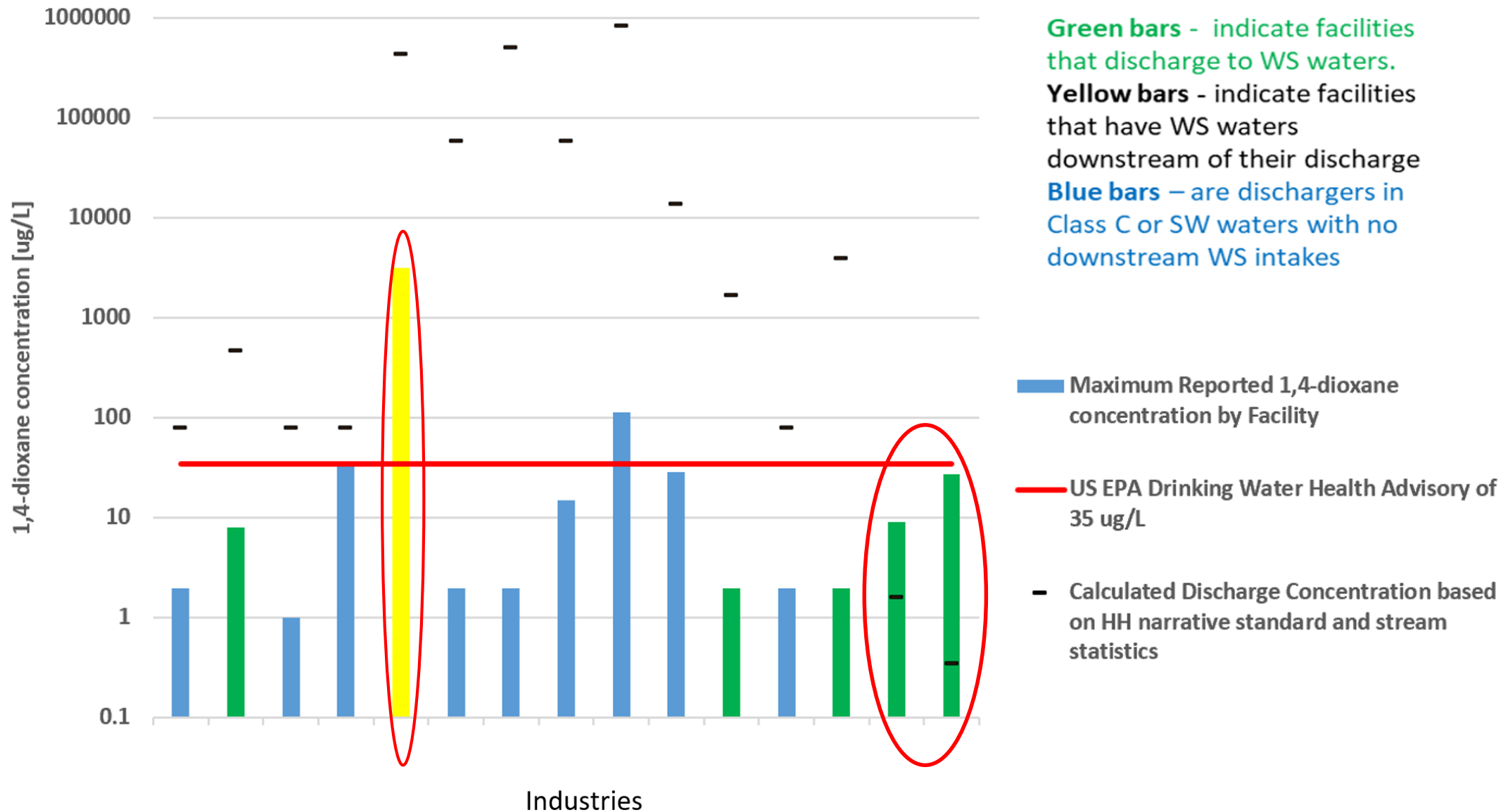
POTWs with Pretreatment Programs in the CFRB

Maximum Reported Total PFAS Concentration by Municipal Facility

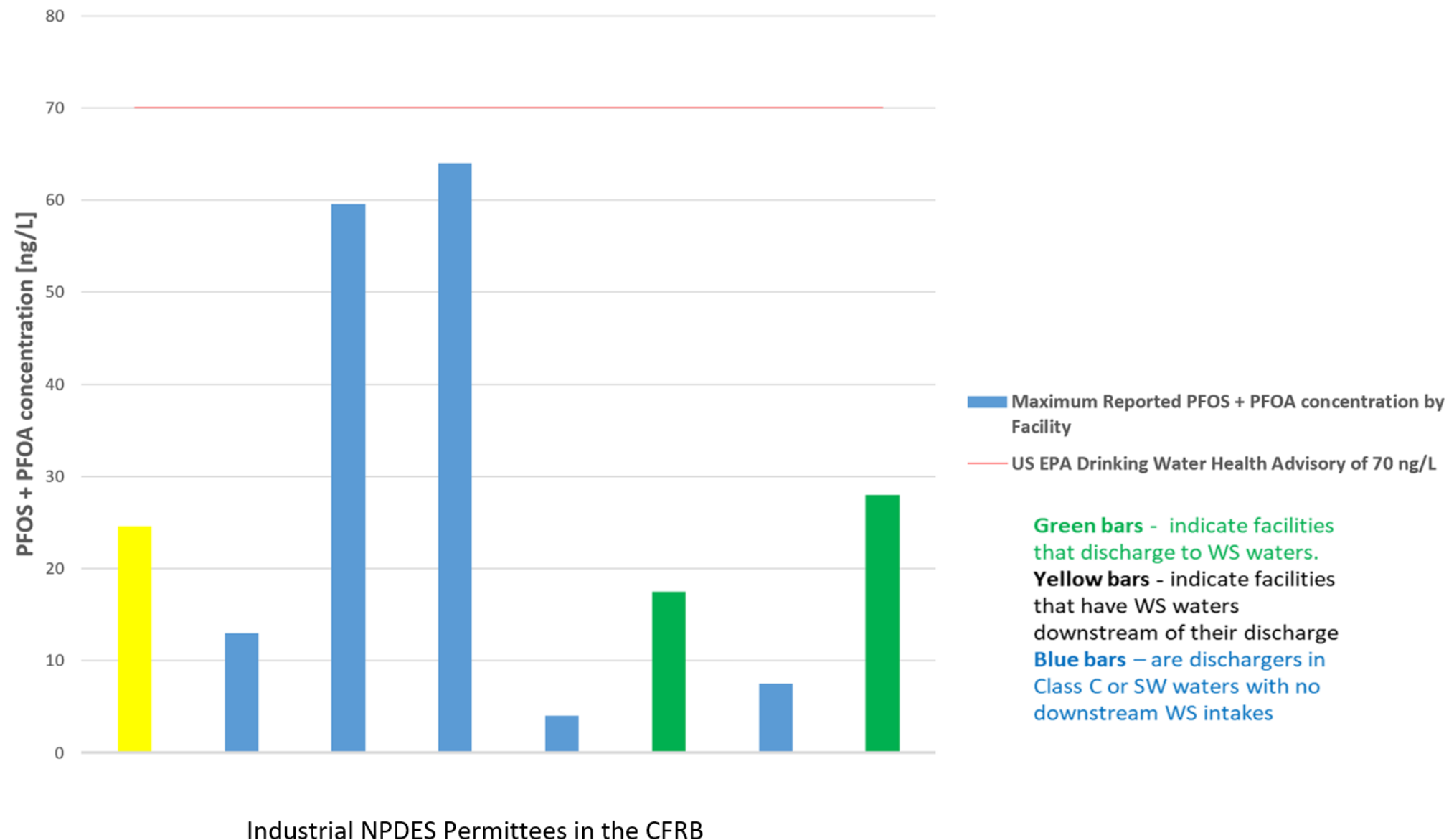


POTWs with Pretreatment Program in the CFRB

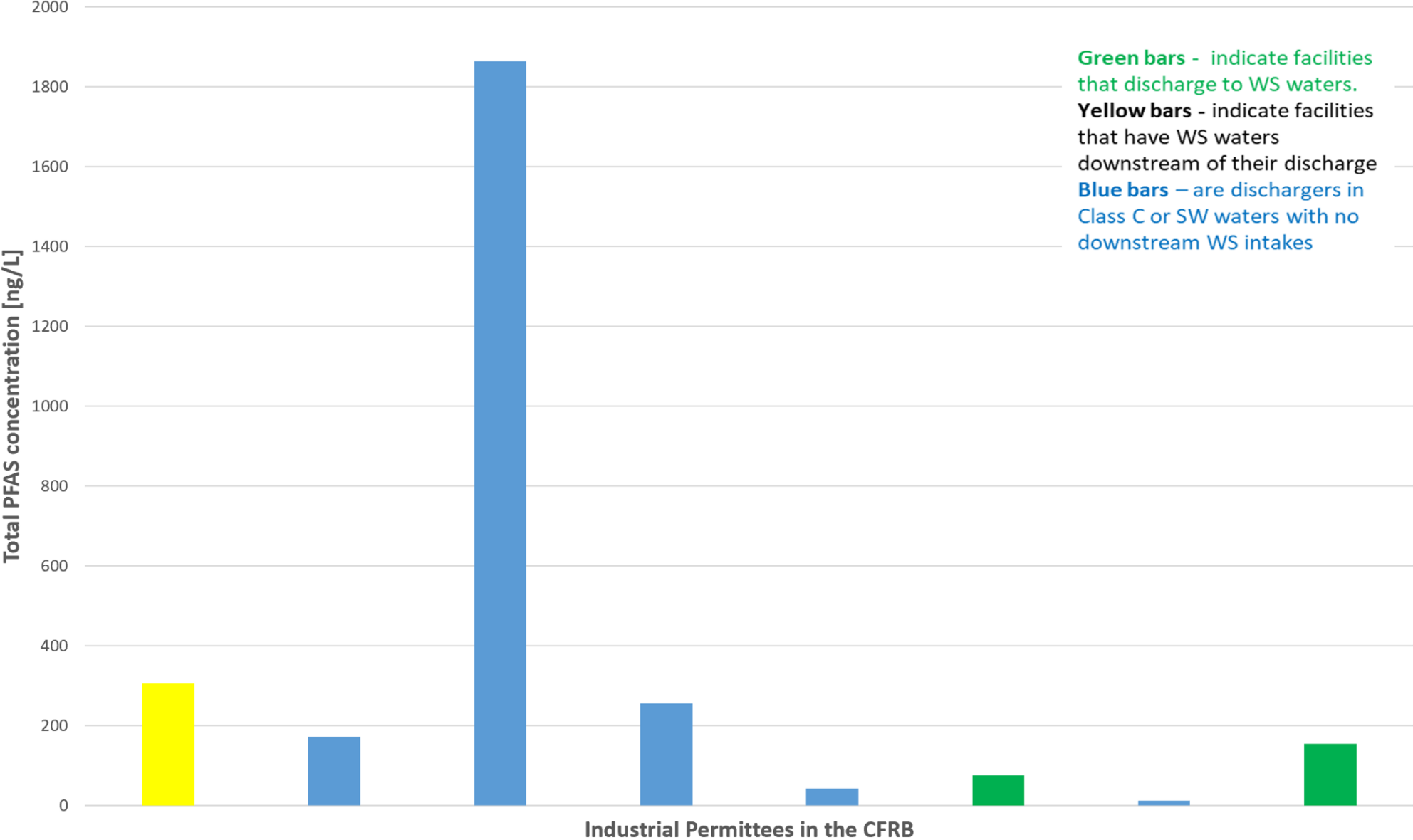
Maximum Reported 1,4-Dioxane Concentration by Industrial Facility



Maximum Reported PFOS + PFOA Concentration by Industrial Facility



Maximum Reported Total PFAS Concentration by Industrial Facility



The Story So Far (Cape Fear)

- ✓ Identify compounds of concern
 - ✓ Look into UCMR
 - ✓ Conduct Statewide Ambient Monitoring
 - ✓ Identify basins of concern
- ✓ Identify dischargers/sources of these compounds
 - ✓ Look into literature and TRI to narrow scope
 - ✓ Request Sampling
 - ✓ Compile sampling results
- ❑ Address steps toward minimizing compound discharge



Water Quality Permitting Management Strategy – Cape Fear Basin

Unregulated Compounds



Regulated Compounds

Cannot solve the problem overnight – DWR will continue to investigate and require additional sampling (effluent) from some permittees

DWR will focus on facilities impacting downstream water supplies with a long-term goal of requiring compliance with narrative Human Health standards (none for PFAS at this time).

Need:

Analytical test methods, human health studies, fish tissue studies

Enhanced reporting data from SIUs and Industrial dischargers

Tested treatment technologies

Background concentrations

Consumer and product changes!



Questions?



Department of Environmental Quality

