

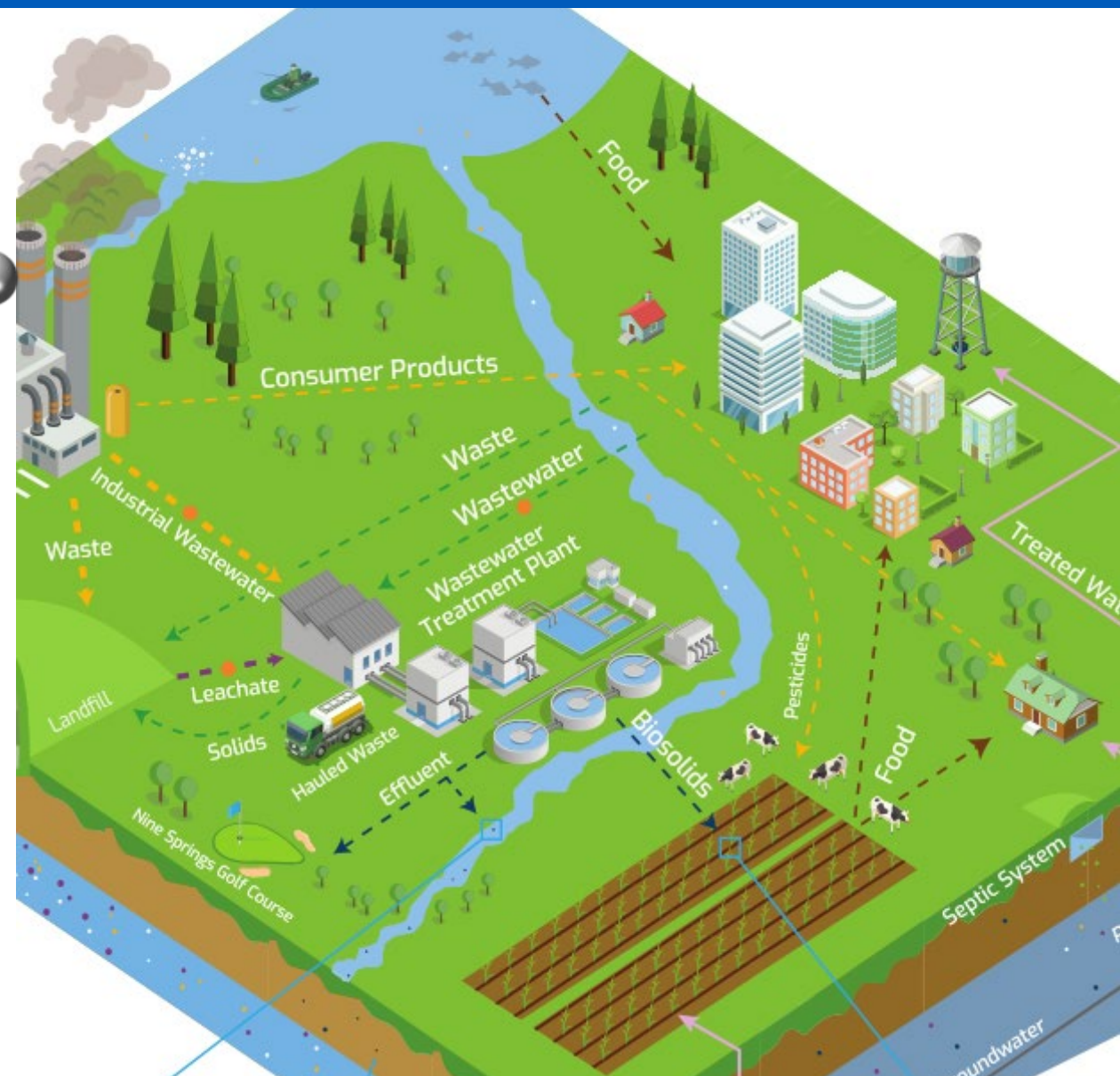
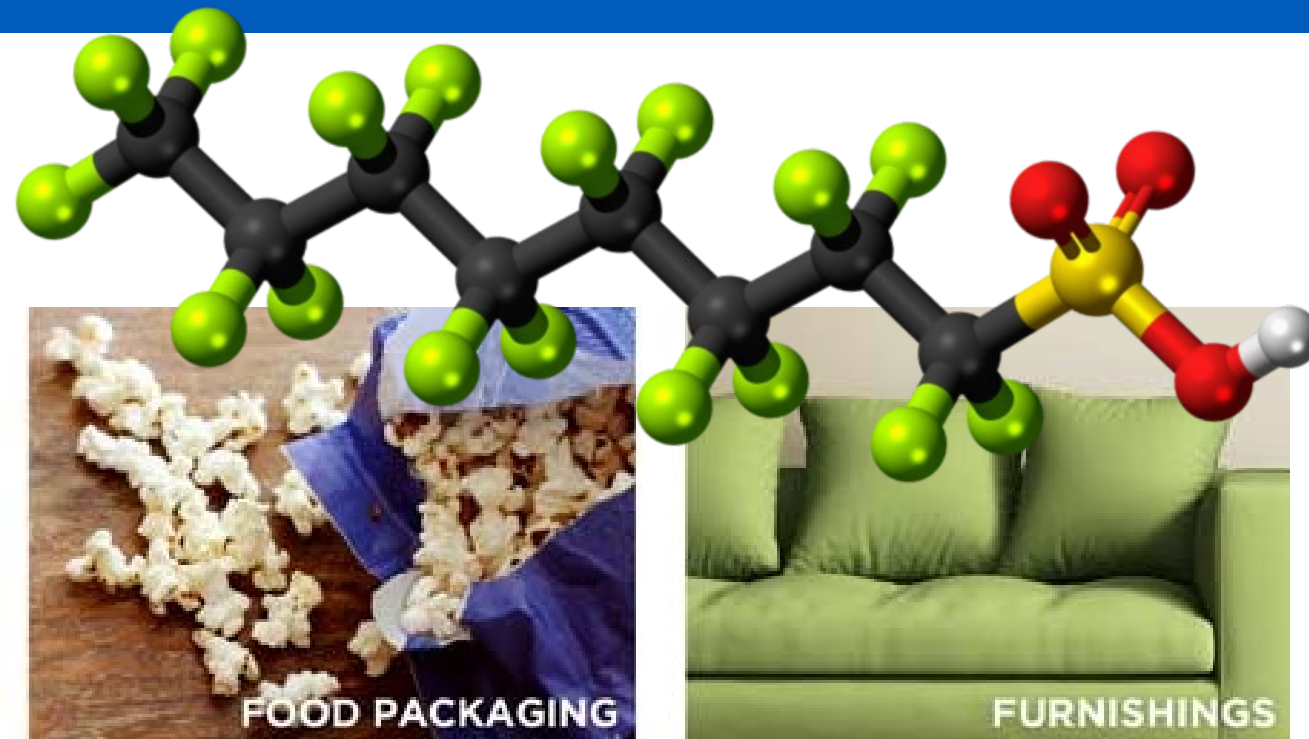
Study Session: Results from Phase 2 PFAS Sampling, Testing and Analysis of District Influent, Effluent, and Biosolids

**Commission Meeting
September 28th, 2023**

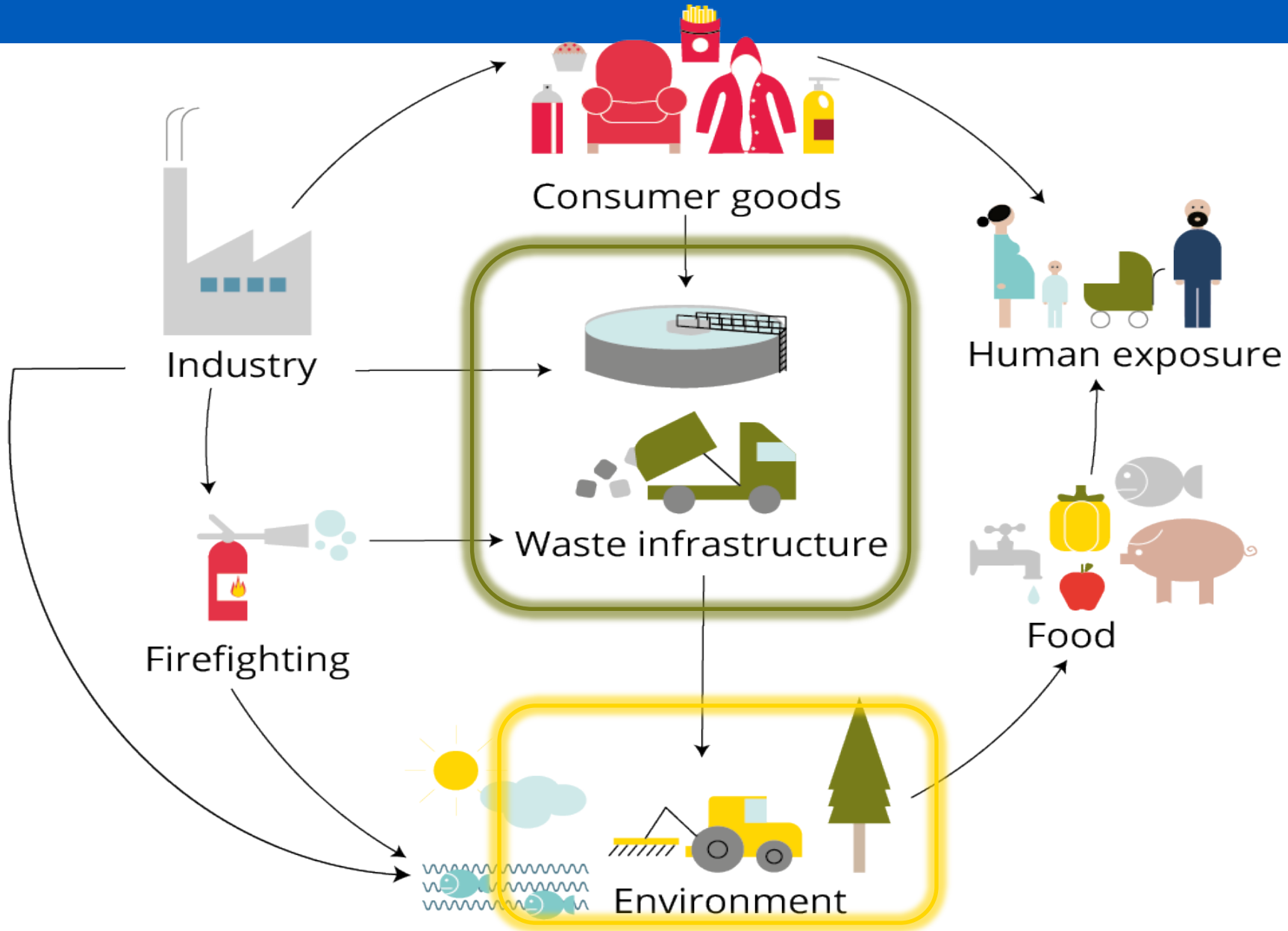


What Are PFAS?

Why Do We Care?



We Reflect the Communities We Serve





Ordinance



Fate & Transport



Pre-Treatment



Website

madsewerpfasinitiative.org



Sampling Plan



Testing

Madison Metropolitan Sewerage District



Background and actions to
address per- and polyfluoroalkyl
substances (PFAS)

Last revised June 4, 2019

Phased Sampling & Analysis Timeline

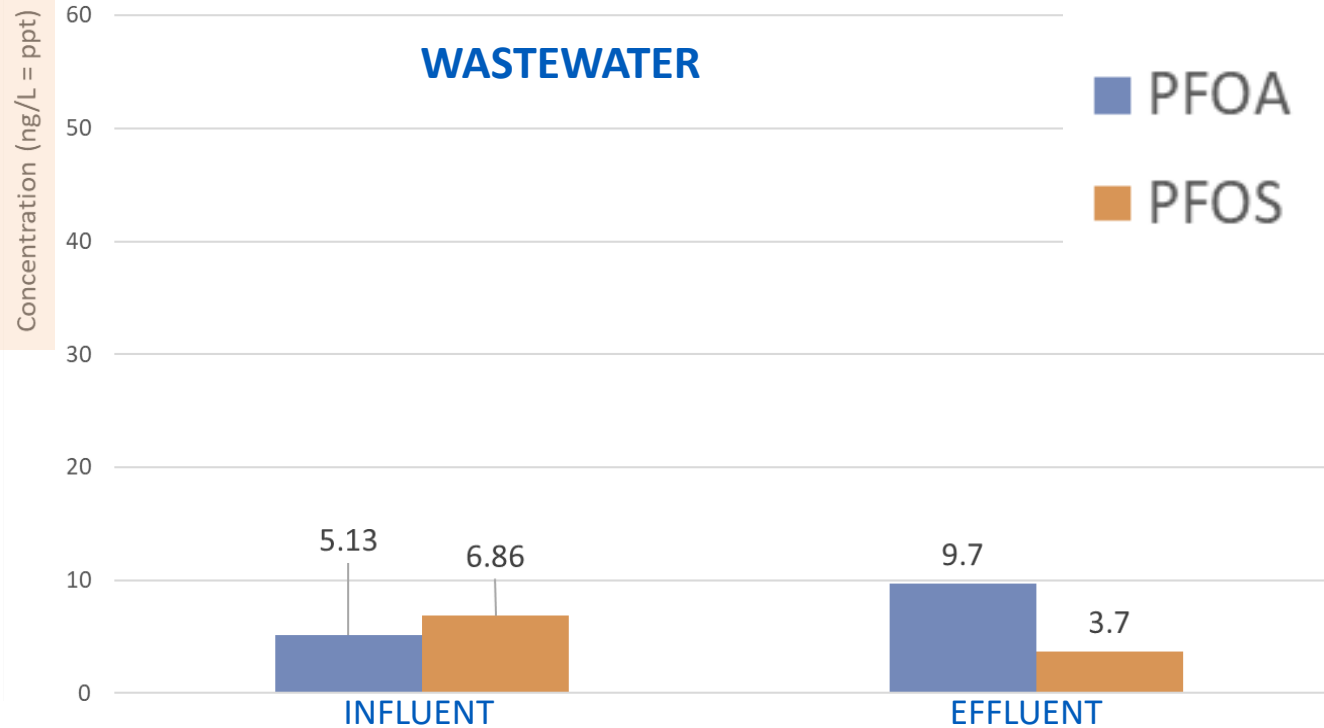


Phase One Recap – Sampling & Analysis

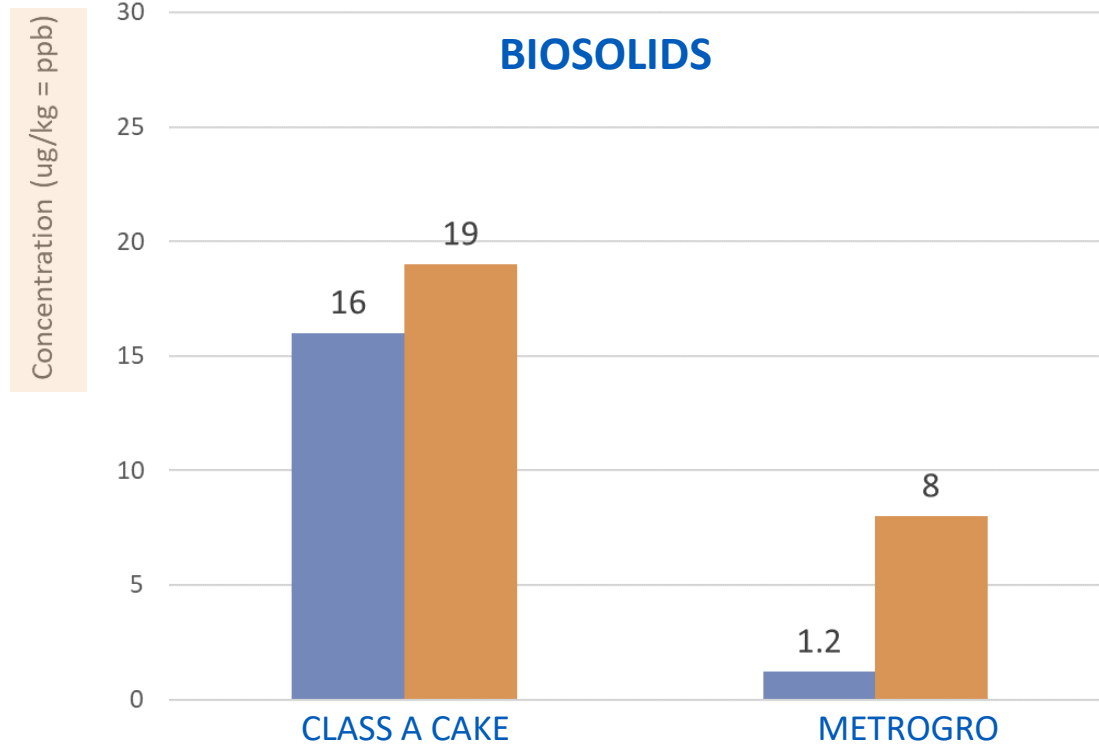
Baseline Knowledge:

- What is coming to the plant from community?
- What is in polymer used for treatment?
- What is leaving the plant in recycled resources?

Phase One Results Recap



PFAS in influent as expected
PFAS in effluent below (proposed) standards
PFAS in effluent higher than influent



No PFAS in polymer
No PFAS in struvite
PFAS in biosolids as expected



Phase Two Sampling & Analysis

Close Knowledge Gaps:

- Why are class A and class B biosolids different?
- Differences in forcemain influent?
- Influent & effluent different over time?

Pollution Prevention:

- Waste evaluation tool

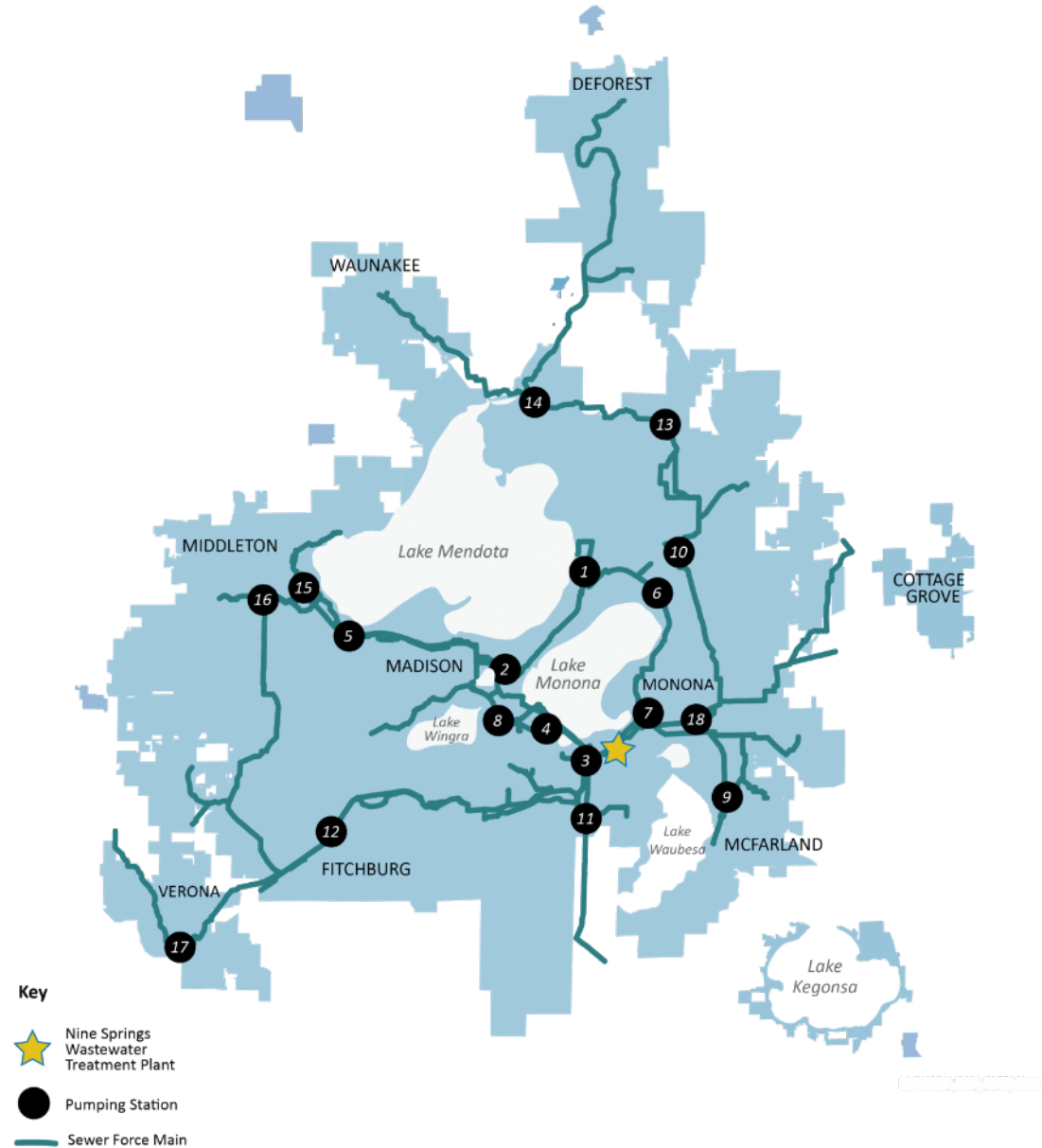


Influent Wastewater



Madison Metropolitan Sewerage District

Pumping Station Force Mains

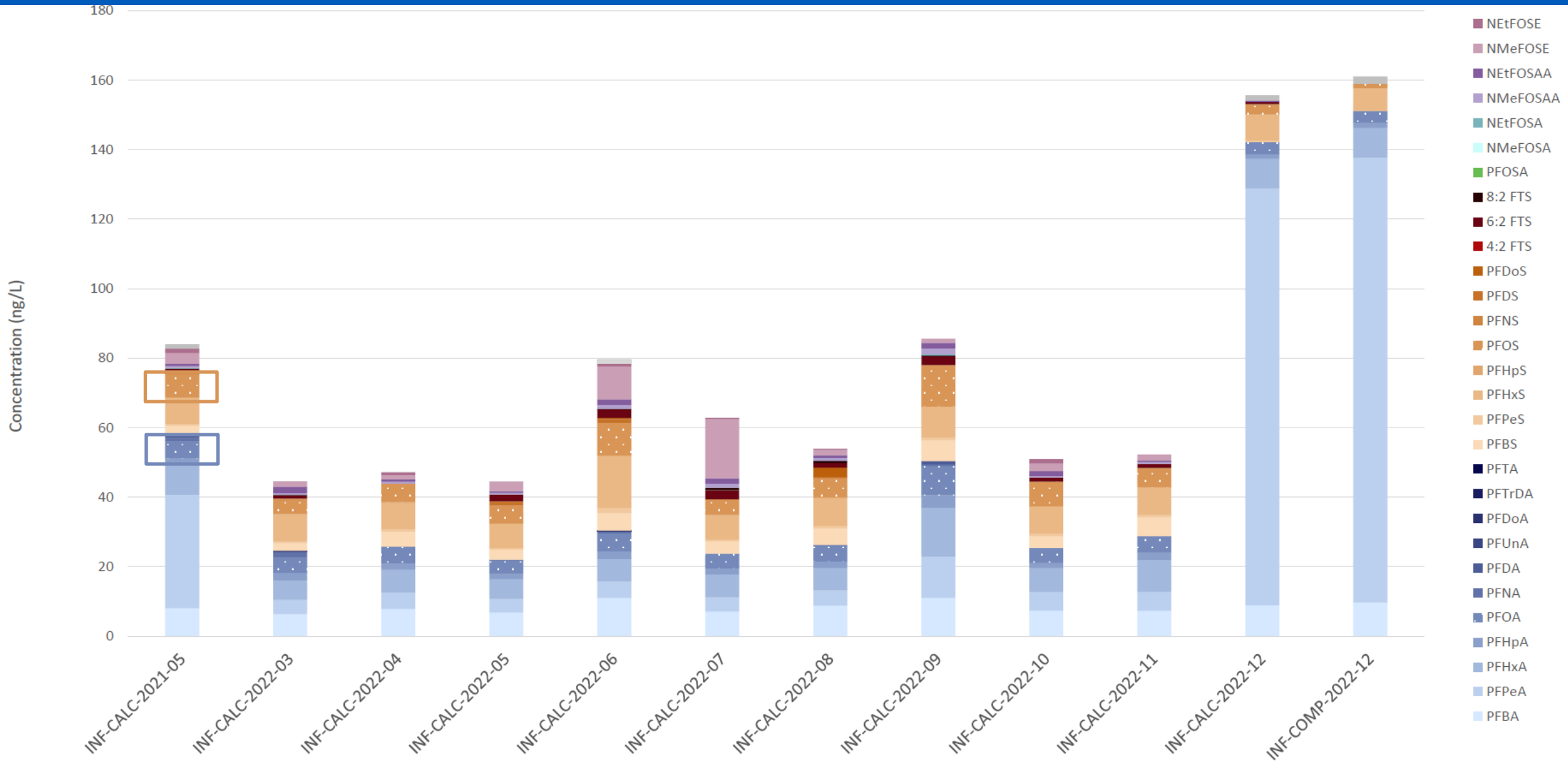


Testing Phase Two – Influent Wastewater

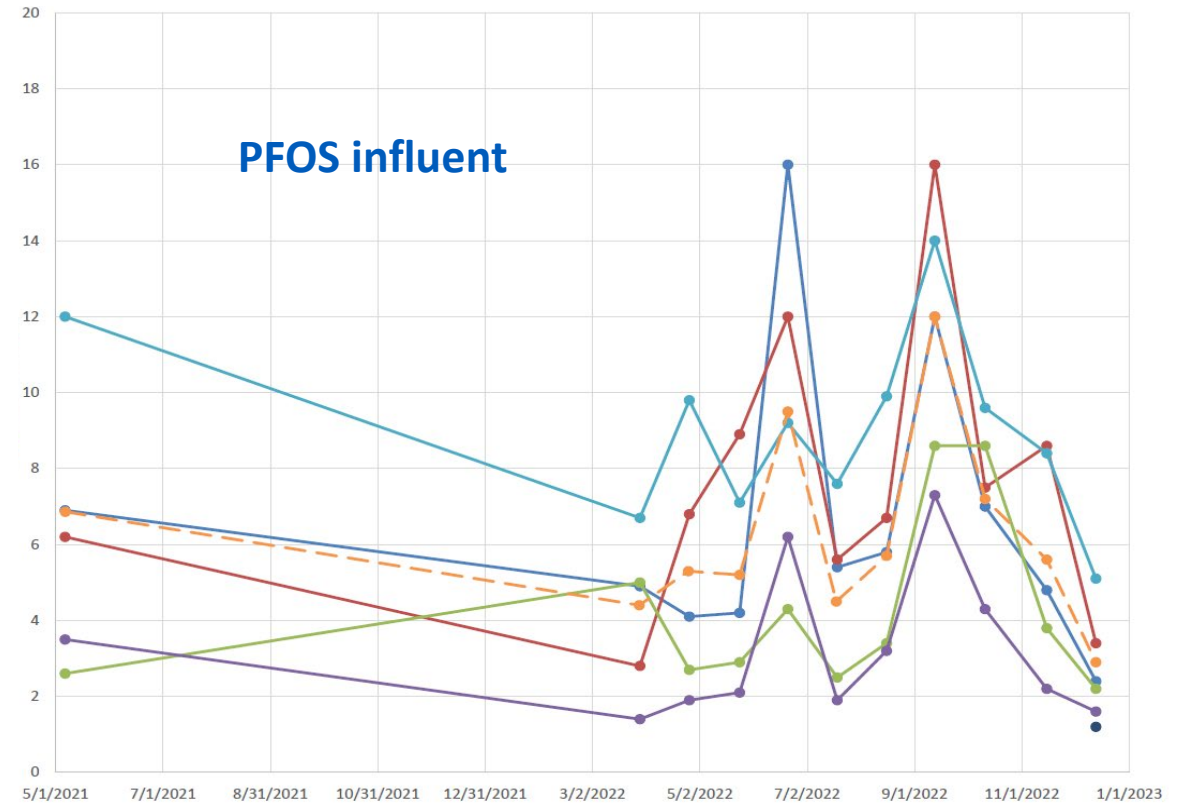
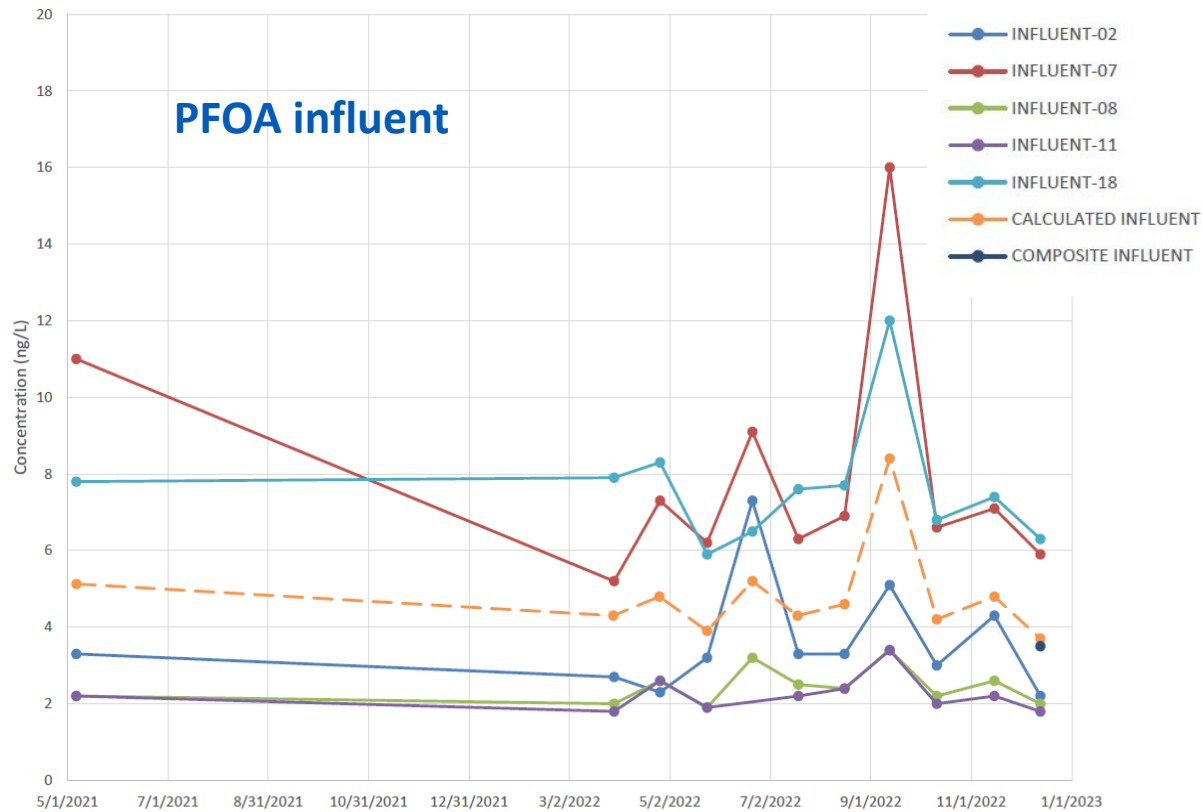
| | May (2021) | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Mich. (study) |
|------------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------------|
| PFOA (ppt) | 5.13 | 4.3 | 4.8 | 3.9 | 5.2 | 4.3 | 4.6 | 8.4 | 4.2 | 4.8 | 3.7 | 4.6 |
| PFOS (ppt) | 6.86 | 4.4 | 5.3 | 5.2 | 9.5 | 4.5 | 5.7 | 12 | 7.2 | 5.6 | 2.9 | 7.5 |



Testing Phase Two – Influent Wastewater



Testing Phase Two – Influent Wastewater



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Phase Two Results - Influent

All force mains:

- PFOA and PFOS consistent
- PFOA lower than PFOS

PFAS types:

- No indicator compounds at high concentrations

Individual force mains:

- No single continuous source



Treated Effluent



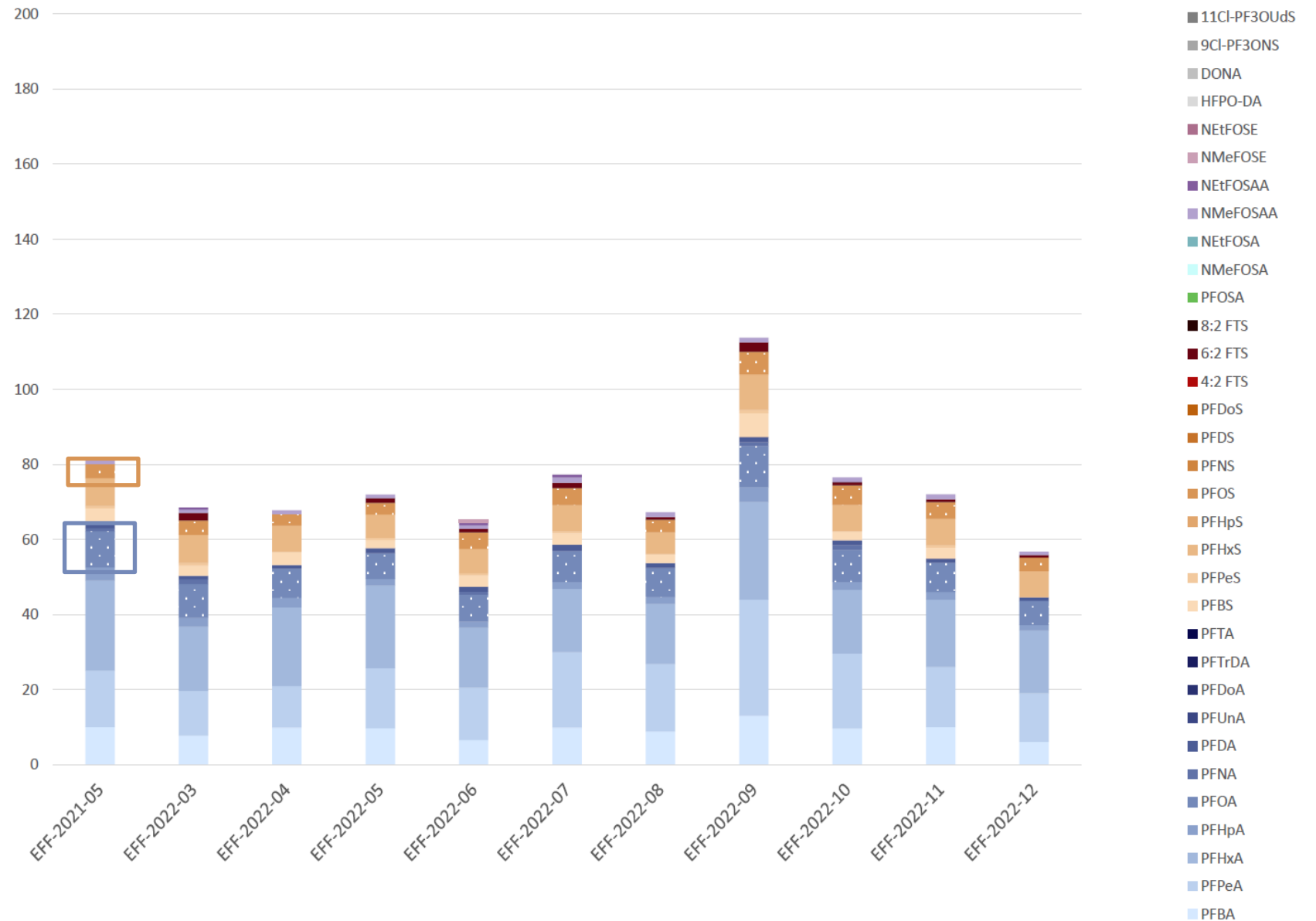
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Testing Phase Two – Treated Effluent

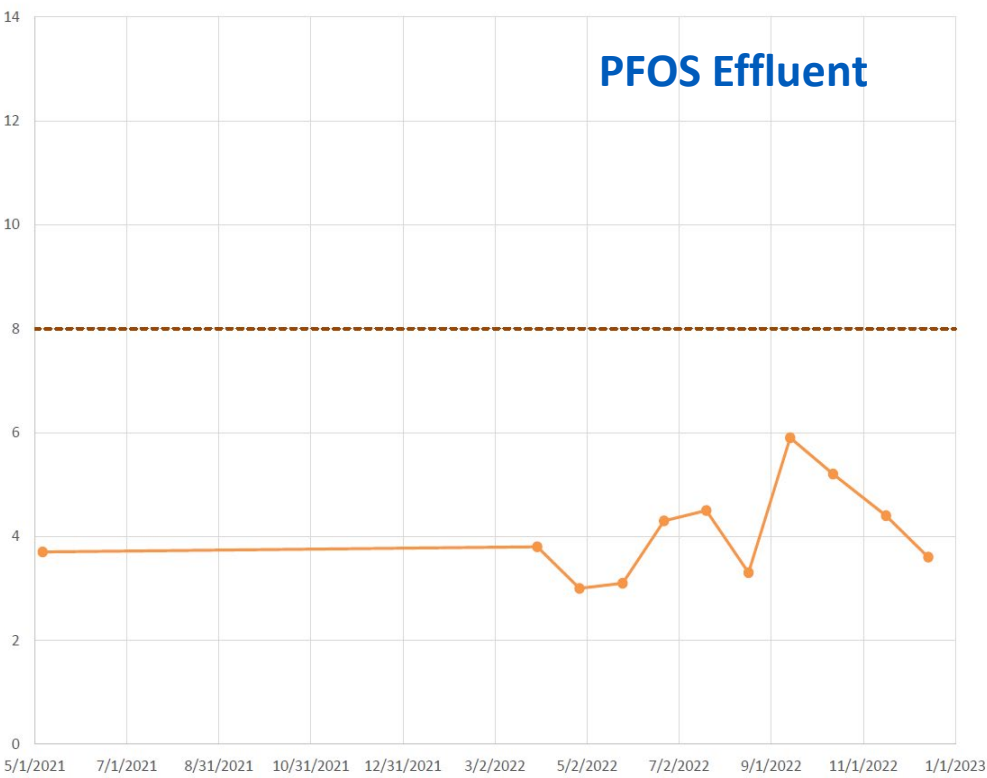
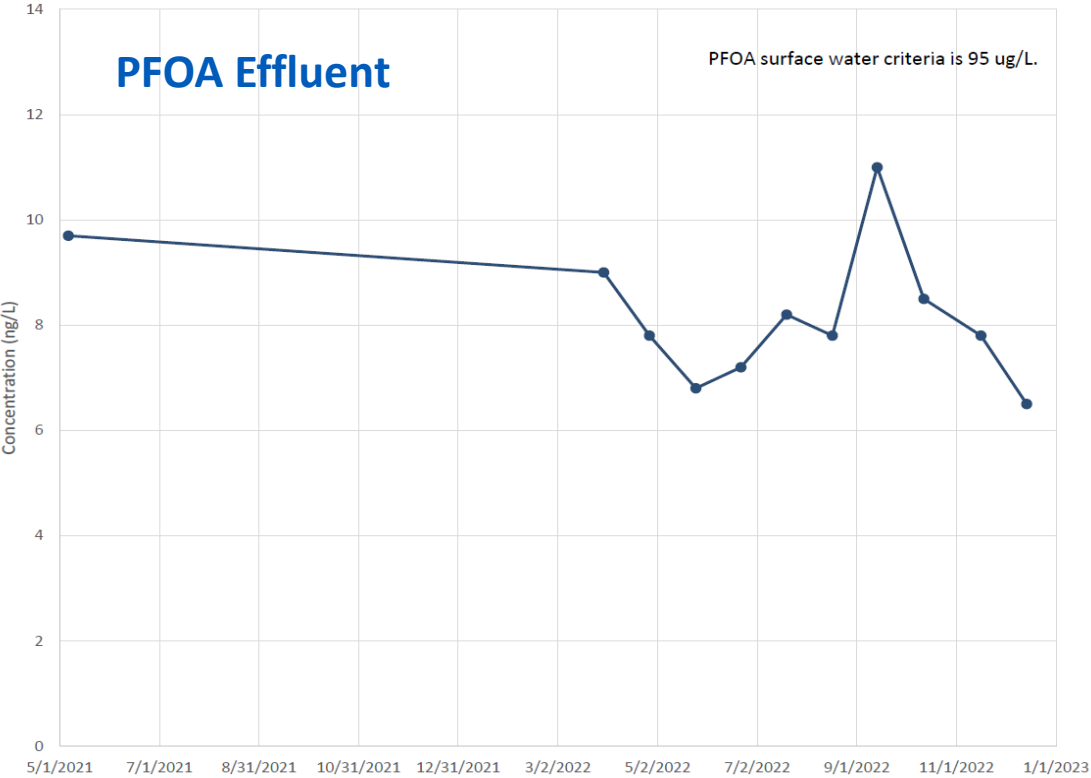
| | May (2021) | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Wisc. std. |
|---------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|
| PFOA (ppt) | 9.7 - 11 | 9.0 | 7.8 | 6.8 | 7.2 | 8.2 | 7.8 | 11 | 8.5 | 7.8 | 6.5 | 95 |
| PFOS (ppt) | 3.7 | 3.8 | 3.0 | 3.1 | 4.3 | 4.5 | 3.3 | 5.9 | 5.2 | 4.4 | 3.6 | 8 |



Testing Phase Two – Treated Effluent



Testing Phase Two – Treated Effluent



Phase Two Results – Treated Effluent

- Levels are below state water quality standards
- Levels differ from month to month
- Levels influenced by influent
- PFOS lower than PFOA

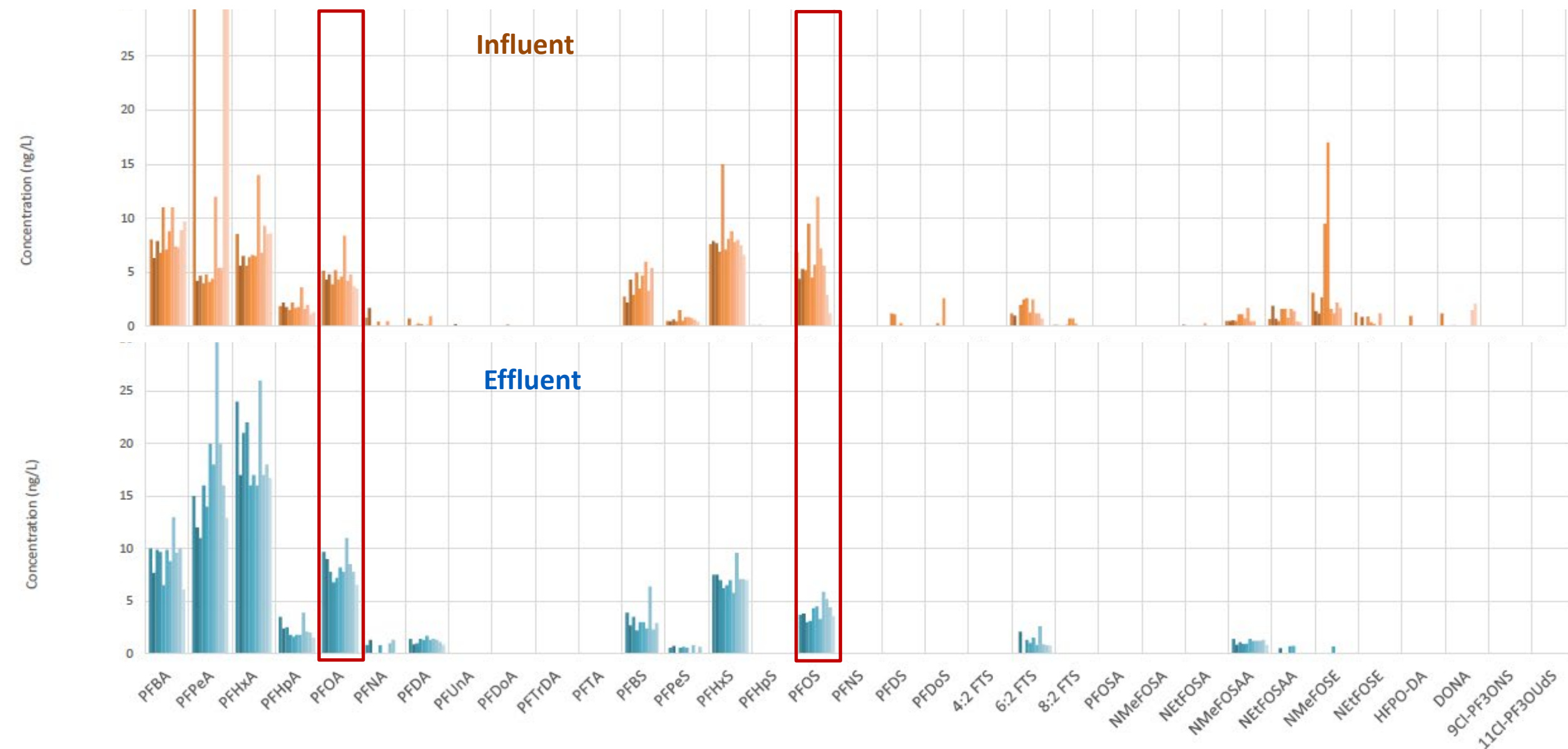


Influent vs. Effluent



Madison Metropolitan Sewerage District

Influent vs. Effluent



Phase Two Results Recap – Influent Vs. Effluent

- PFOA higher in effluent than influent
- PFOS lower in effluent than influent
- Effluent Levels influenced by influent
- Precursors in influent impact effluent

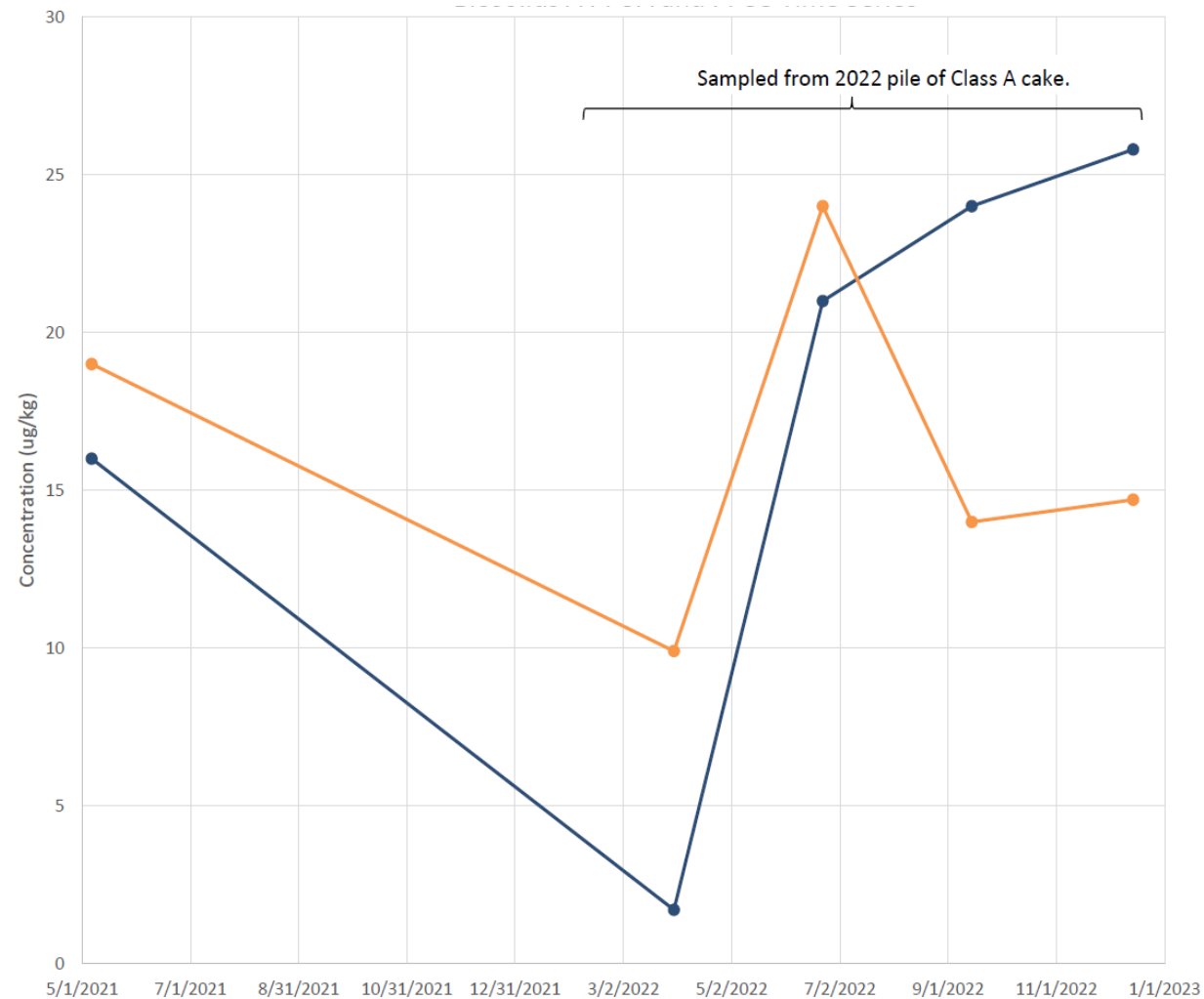


Biosolids



Madison Metropolitan Sewerage District

Biosolids



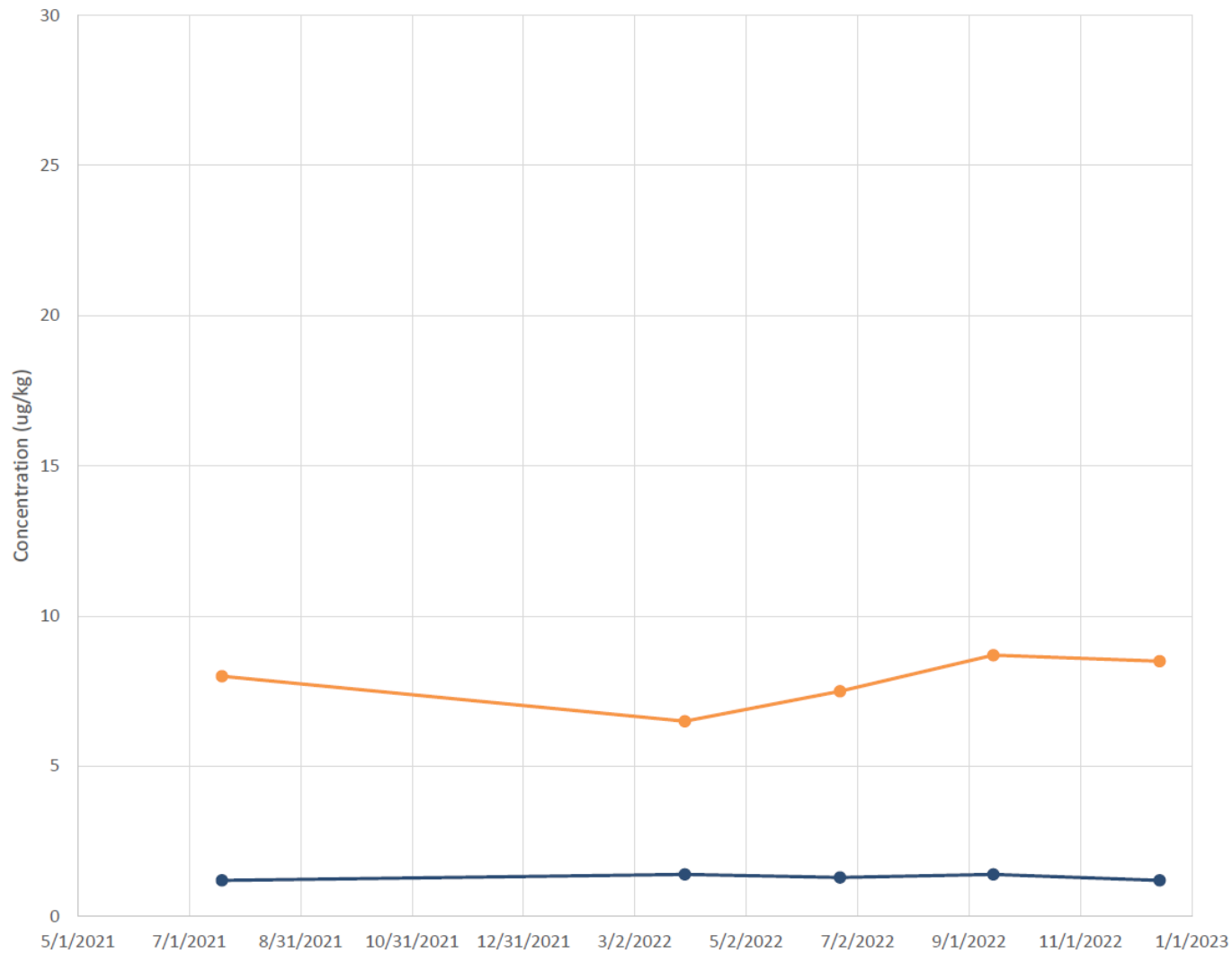
Class A Cake

—●— PFOA
—●— PFOS

Madison Metropolitan Sewerage District



Biosolids



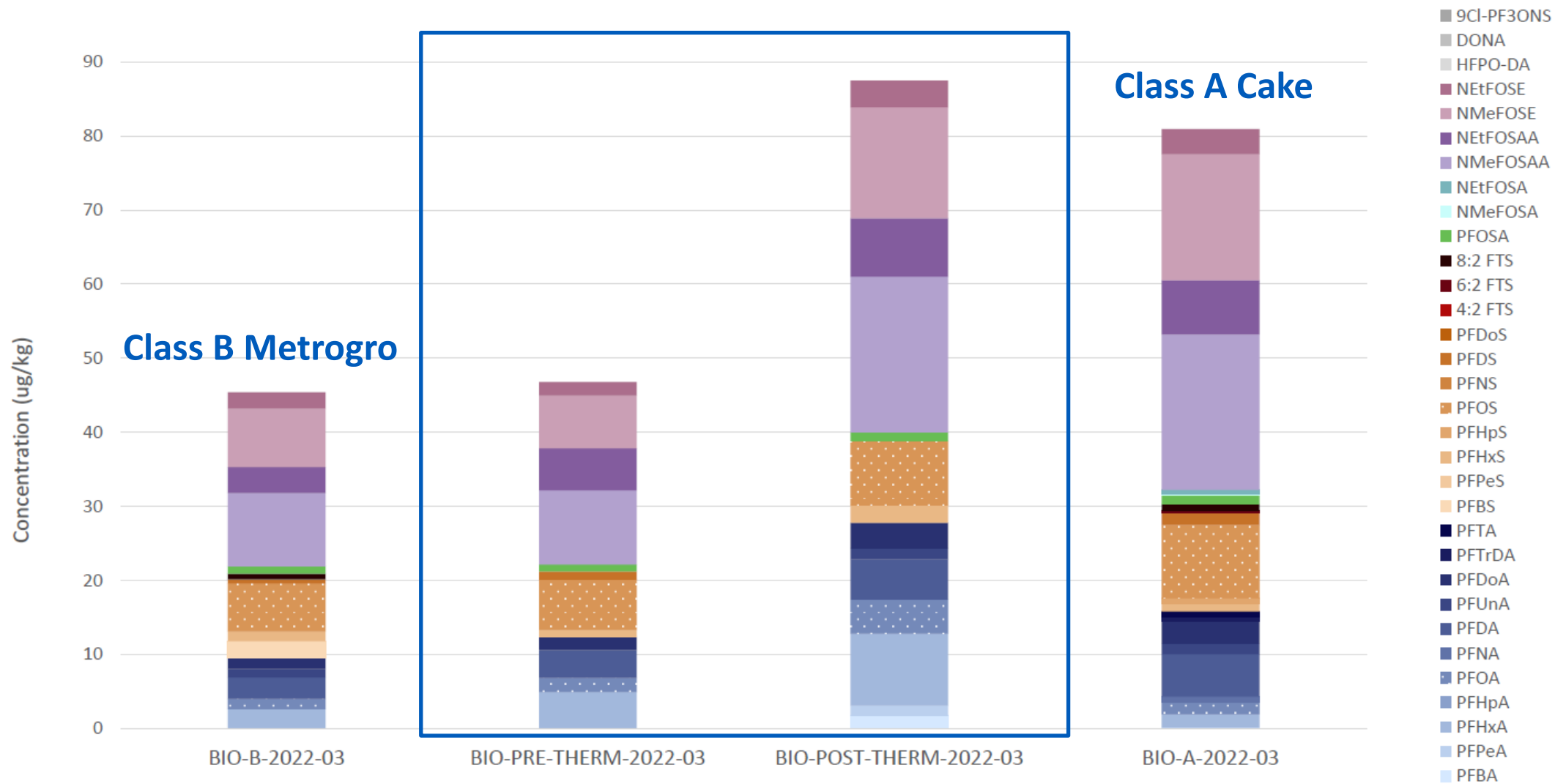
Class B Metrogro

—●— PFOA
—●— PFOS

Madison Metropolitan Sewerage District



Biosolids



Biosolids

Class B Metrogro

| | Mar | Jun | Sep | Dec | Median |
|----------------------------|-----------|-----|-----|-----|--------|
| PFOA (ppb) | 1.3 - 1.4 | 1.3 | 1.4 | 1.2 | 1.3 |
| PFOS (ppb) | 6.3 - 6.5 | 7.5 | 8.7 | 8.5 | 7.5 |
| Combined median PFOA+ PFOS | n/a | n/a | n/a | n/a | 8.8 |

Class A Cake

| | Mar | Jun | Sep | Dec | Median |
|----------------------------|-----------|-----|-----|------|--------|
| PFOA (ppb) | 1.7 - 1.7 | 21 | 24 | 25.8 | 21 |
| PFOS (ppb) | 9.7 - 9.9 | 24 | 14 | 14.7 | 14 |
| Combined median PFOA+ PFOS | n/a | n/a | n/a | n/a | 35 |



Phase Two Results Recap - Biosolids

- levels consistent over time
- levels consistent during the solids handling processes.
- Class A cake higher than Class B Metrogro
- PFOA and PFOS levels below threshold to impact land application



Phase Two Results Recap – Wastewater & Biosolids

- PFAS levels continue to be as expected
- PFAS types continue to be as expected
- PFOA and PFOS levels in effluent below State surface water standards
- PFOA and PFOS in biosolids below the threshold for reducing land application rates



Next Steps



Madison Metropolitan Sewerage District

Phase Three – 2023 Sampling & Analysis

Close Knowledge Gaps & Align Monitoring

1. Continue temporal monitoring
2. Align with new DNR administrative rules
3. Better understand PFAS impact to biosolids



Next Steps



Thank You

**DOING OUR PART FOR
PFAS**

madsewerpfasinitiative.org

Across the nation, communities and public entities are struggling with how to best address the issue PFAS, or per- and polyfluoroalkyl substances, in our environment.

Learn more about what Madison Metropolitan Sewerage District is doing to address PFAS in wastewater and beneficial biosolids and the role