



A New Vision for the Forensic Analysis of PFAS

Northeast Conference

The Science of PFAS: Public Health & the Environment

April 6, 2022



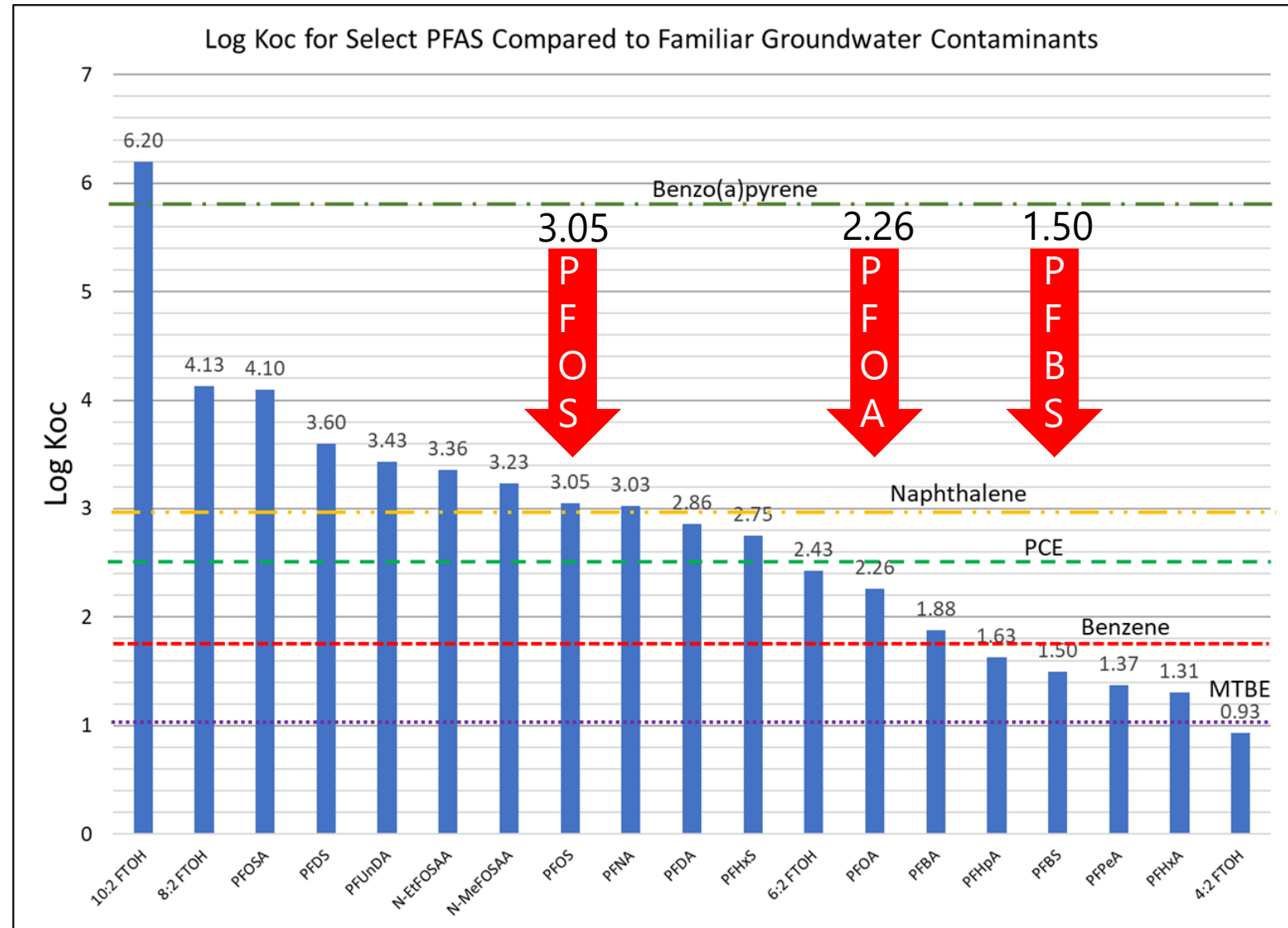
**Woodard
& Curran**

PFAS Vision provides rapid insight for key aspects of CSM

- ▶ Spatial patterns and distribution in groundwater
- ▶ Source type and signature
- ▶ PFAS composition and proportions
- ▶ Indication of comingled plumes
- ▶ Statistical concentration distribution
- ▶ Comparison to regulatory criteria and sensitivity analysis
- ▶ Fate & transport characteristics
- ▶ Concentration versus distance and attainment distance

Fractionation of PFAS in GW occurs due to differential sorption

- ▶ Results in changing proportion of PFAS with migration distance,
- ▶ Causes morphing signature from common source, and
- ▶ Provides evidence of transport in porous media

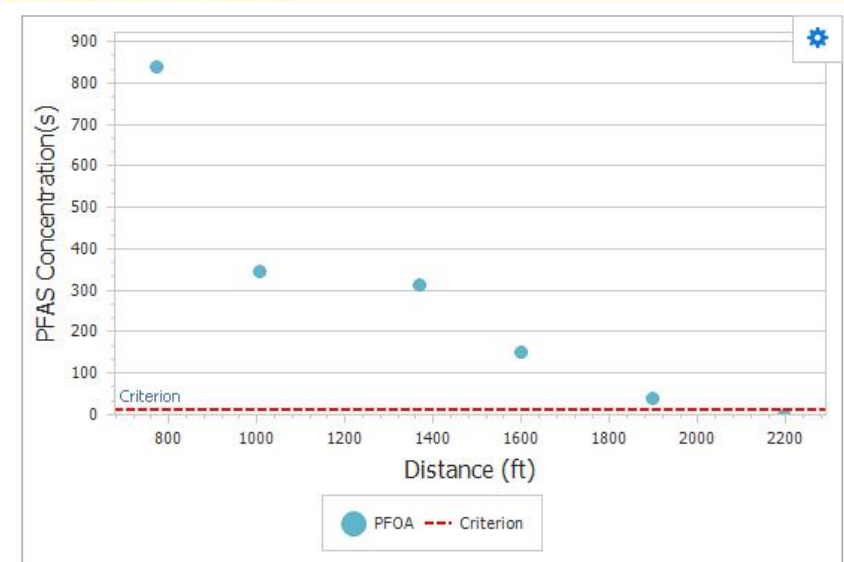
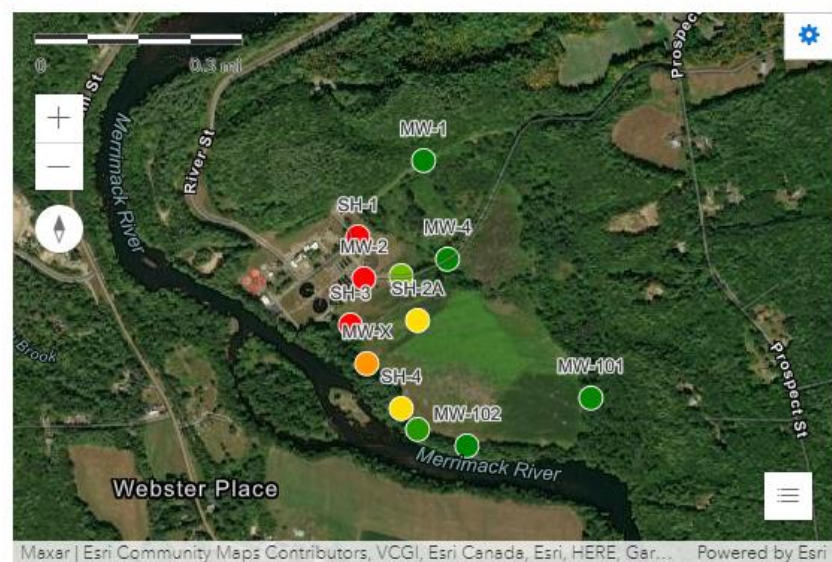
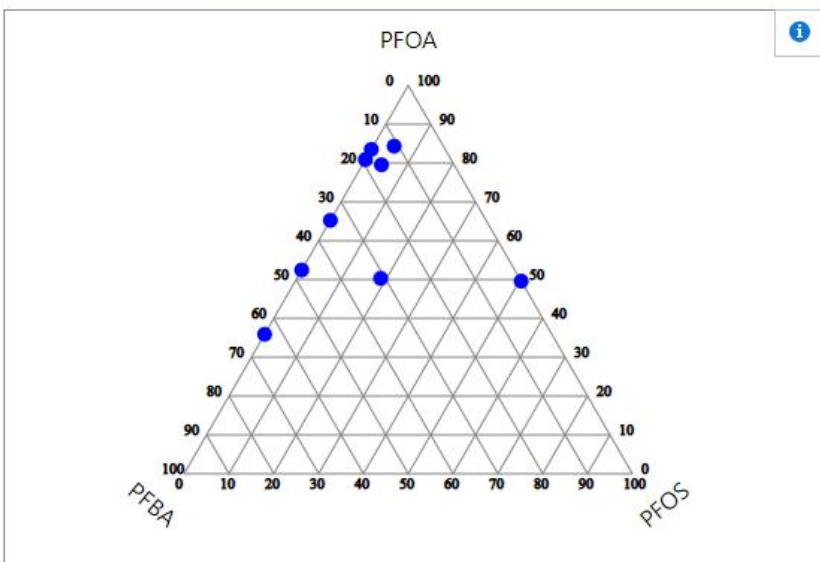


Mass Basis Molar Basis

Area Map

Distance vs. PFAS Concentration

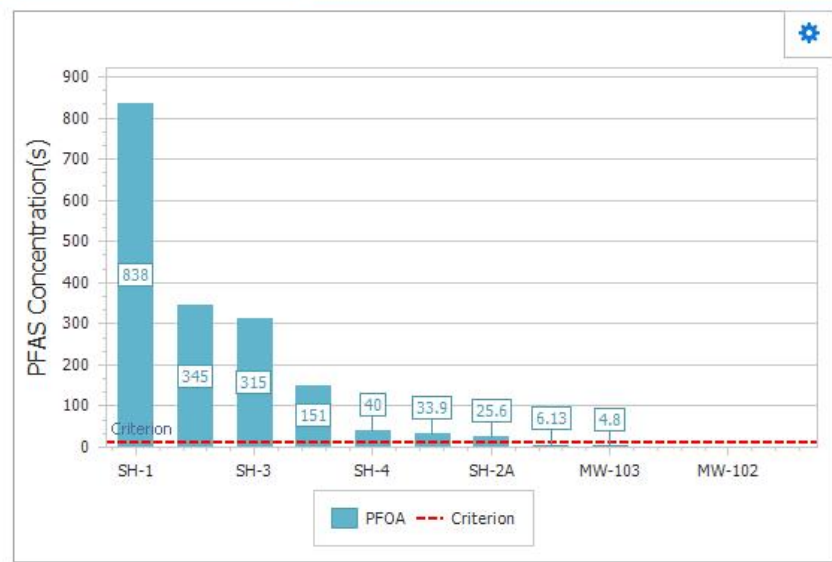
Source Well: MW-1



Radar Diagram Normalized Radar Chart Pie Chart

PFAS with Concentration Distribution

PFAS Relative Percent Bar Chart



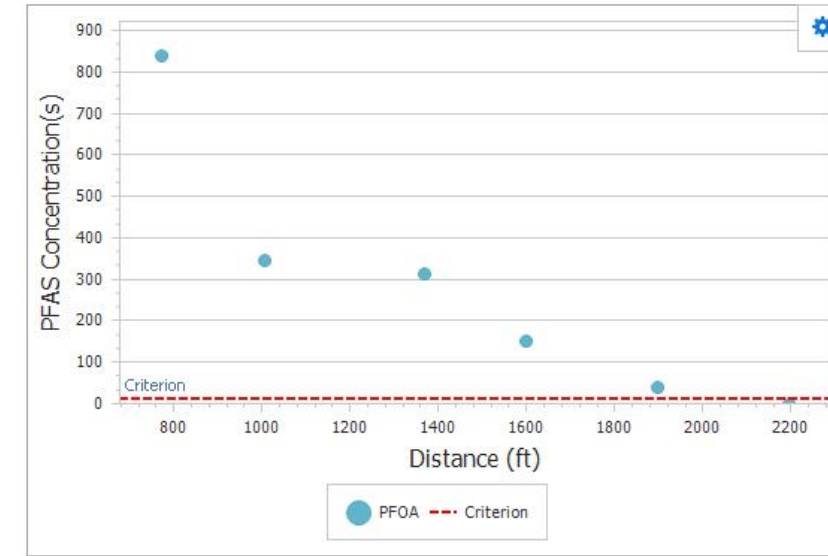
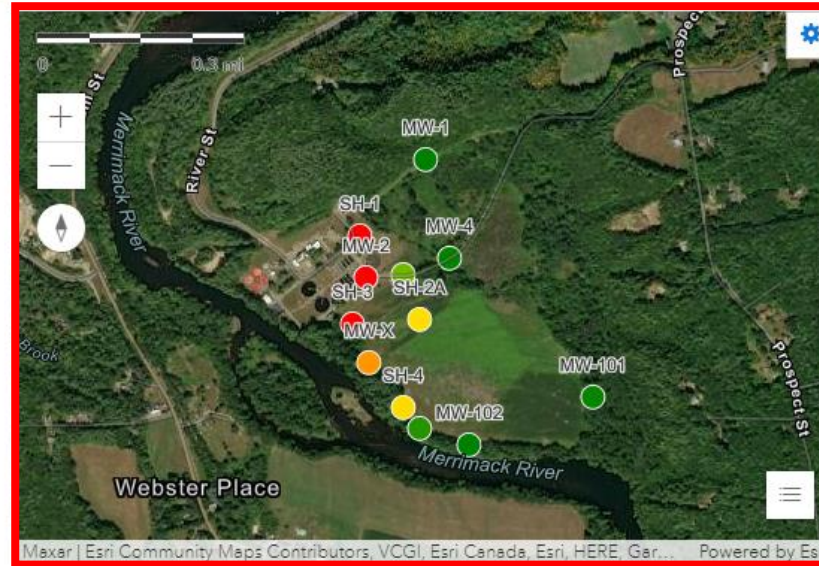
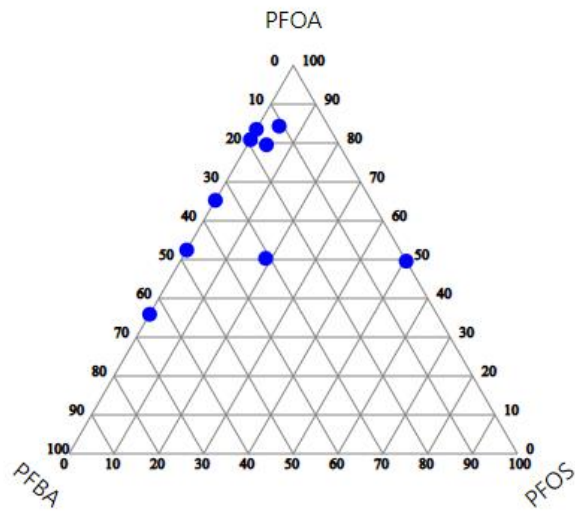
Mass Basis

Molar Basis

Area Map

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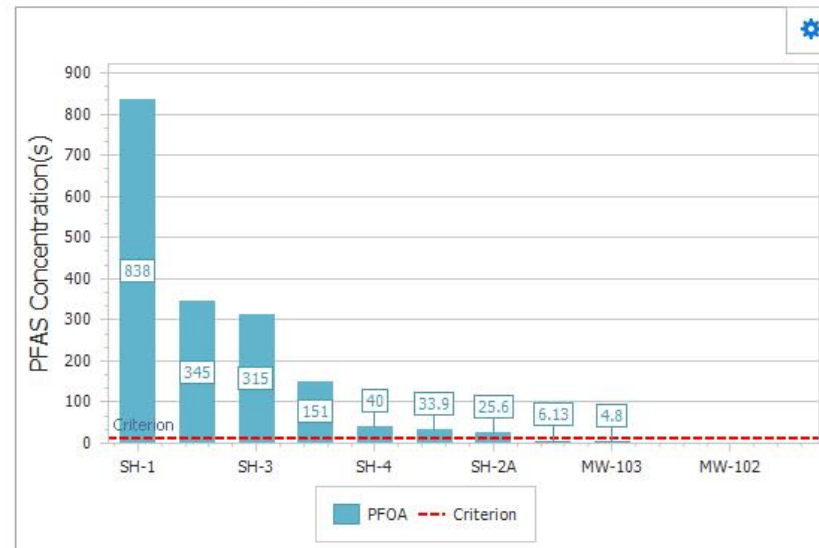
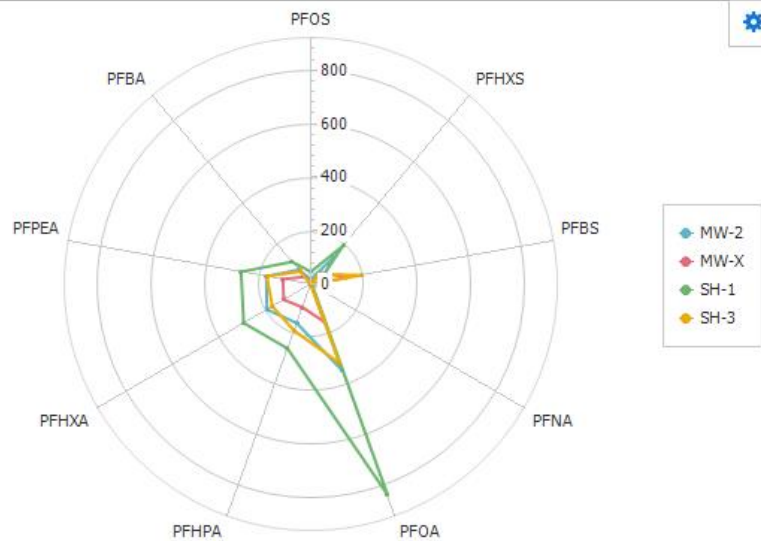
Radar Diagram

Normalized Radar Chart

Pie Chart

PFAS with Concentration Distribution

PFAS Relative Percent Bar Chart



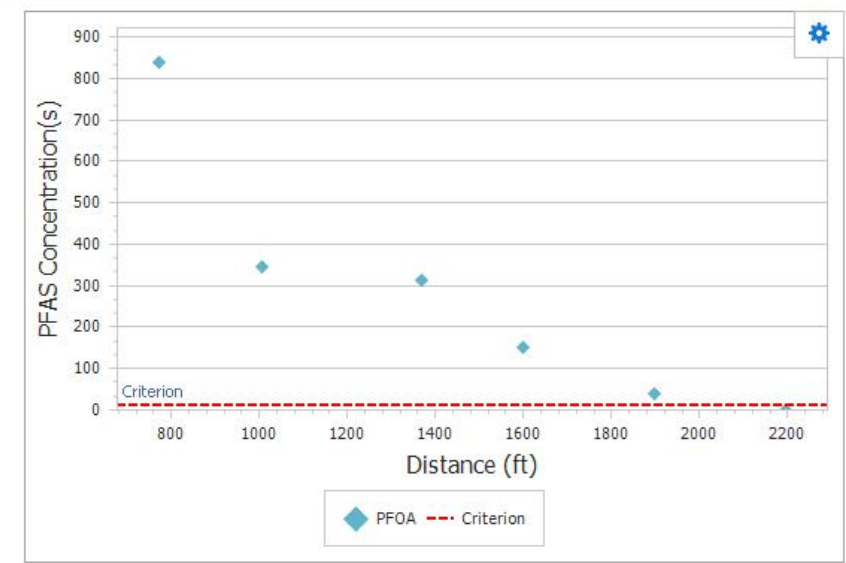
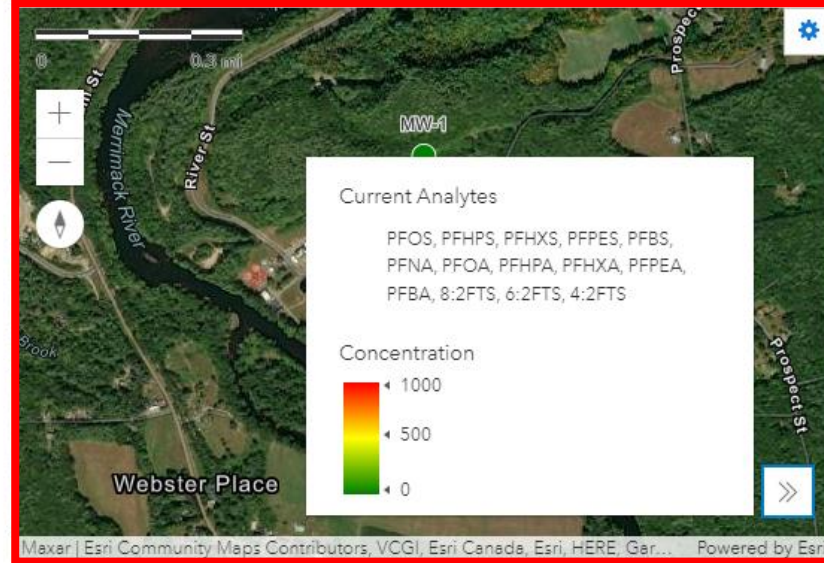
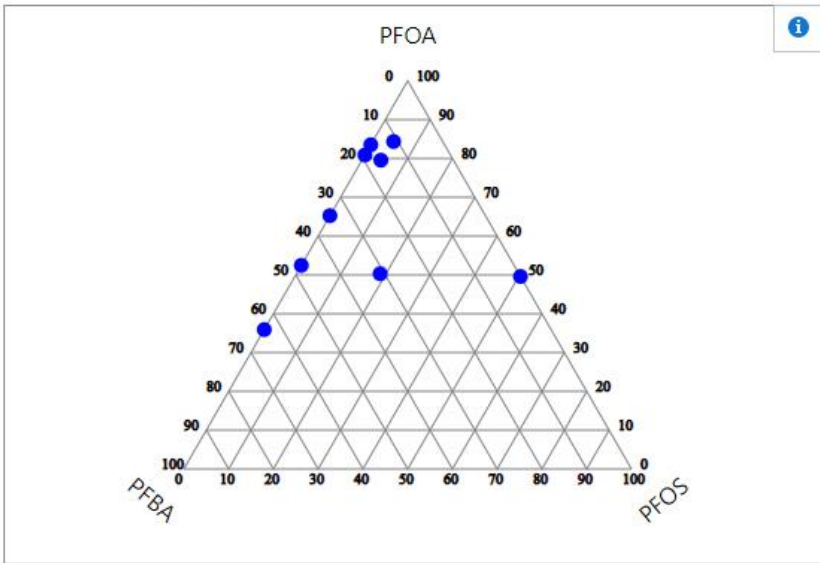
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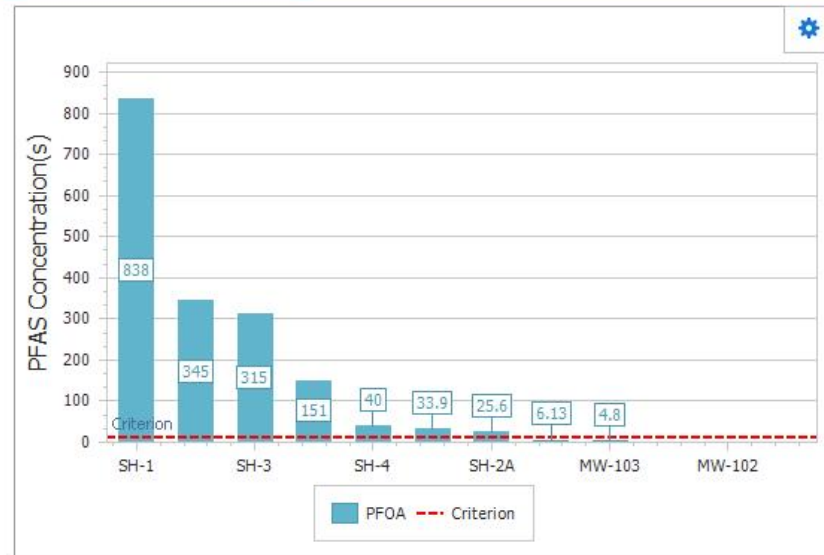
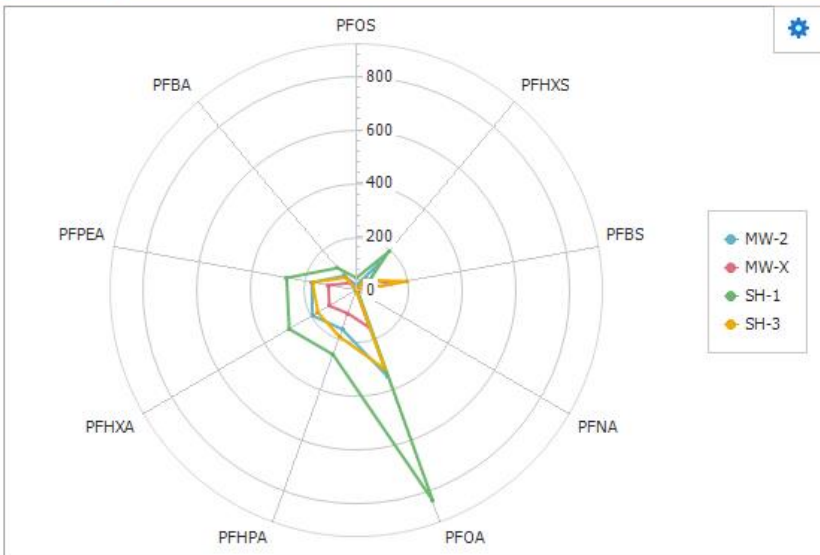
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Radial Diagram Normalized Radar Chart Pie Chart

PFAS with Concentration Distribution

PFAS Relative Percent Bar Chart

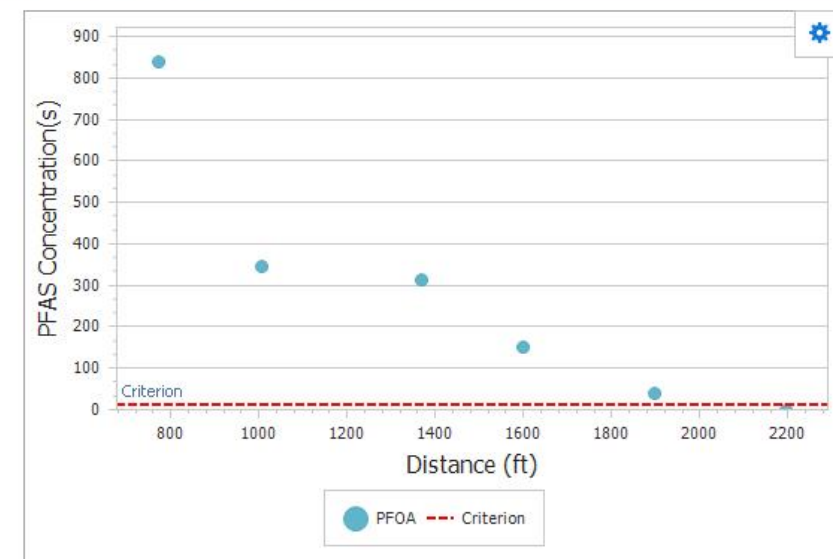
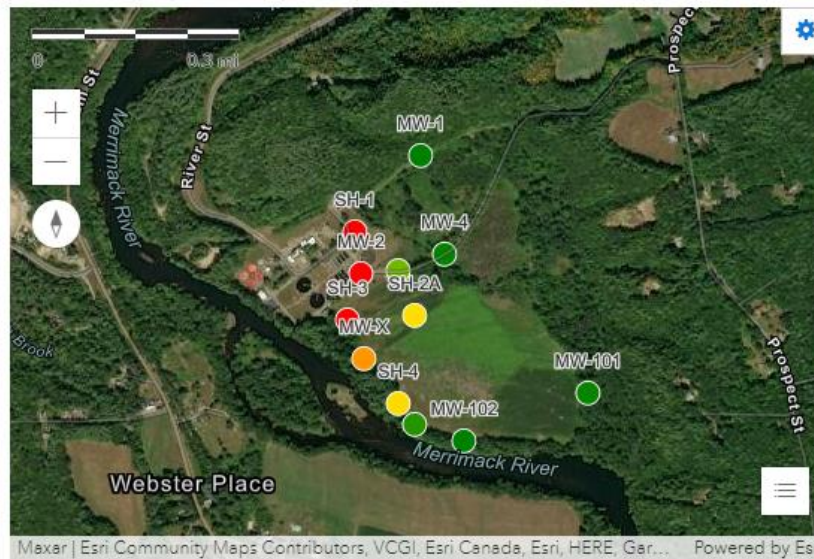
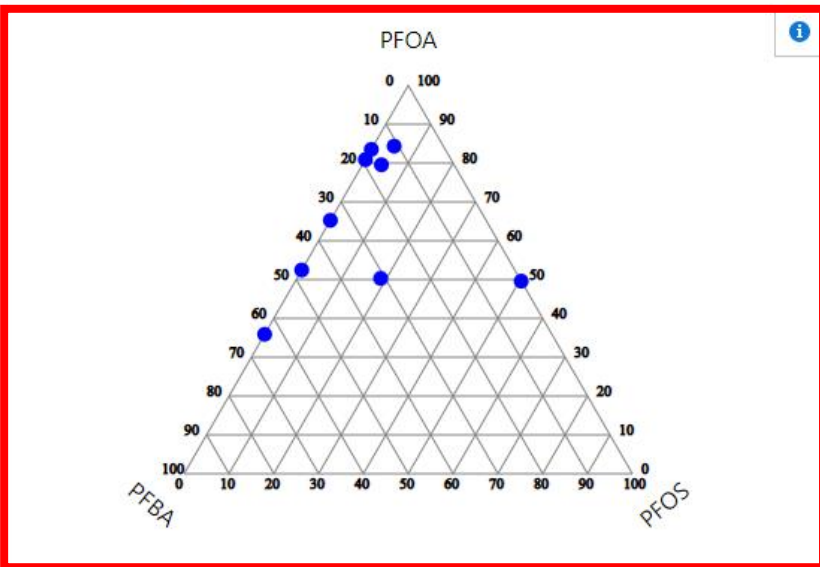


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Area Map

Distance vs. PFAS Concentration

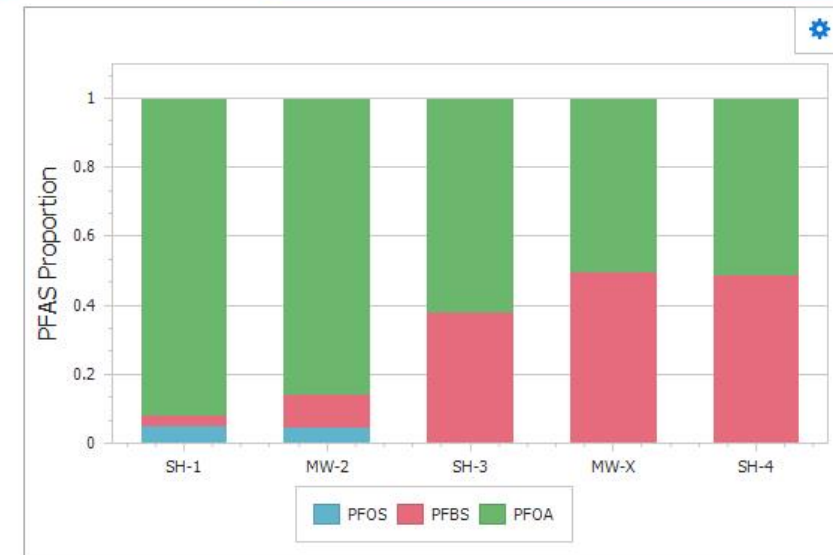
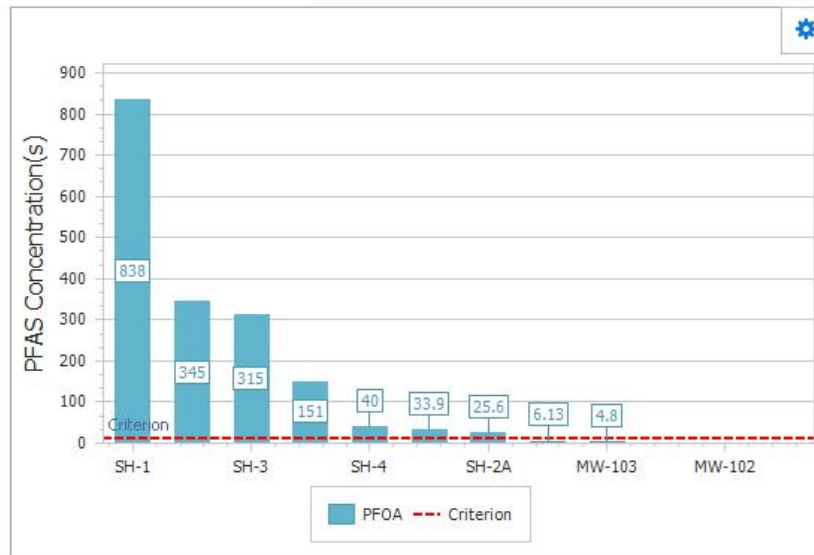
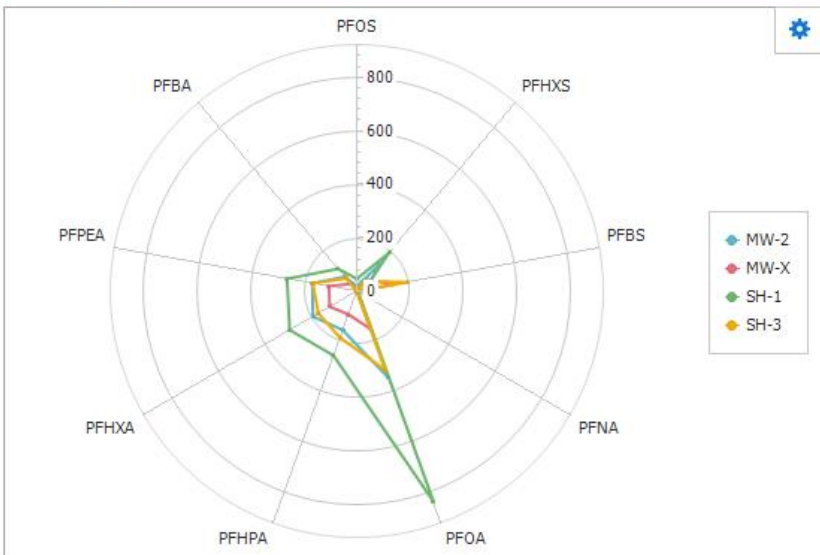
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Radar Diagram Normalized Radar Chart Pie Chart

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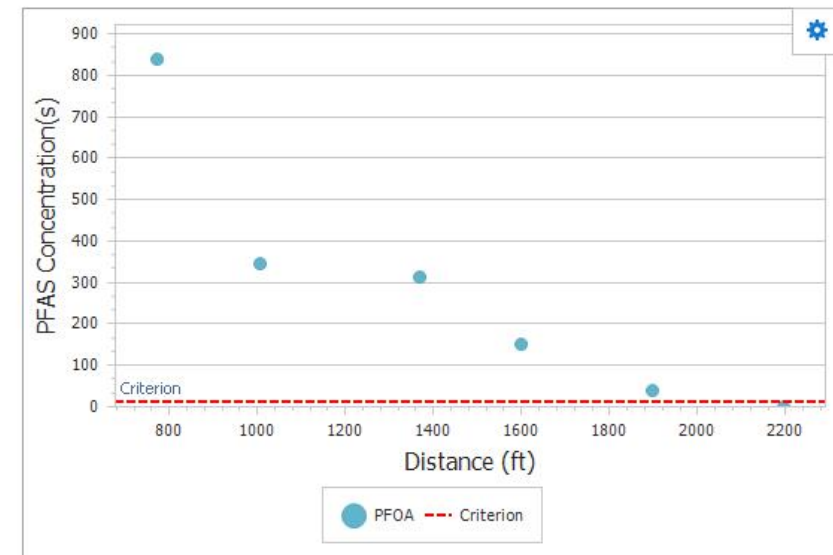
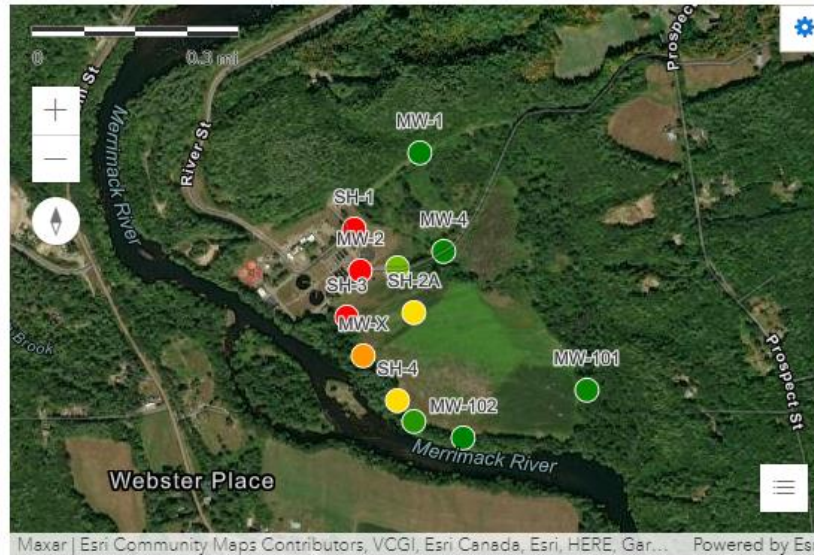
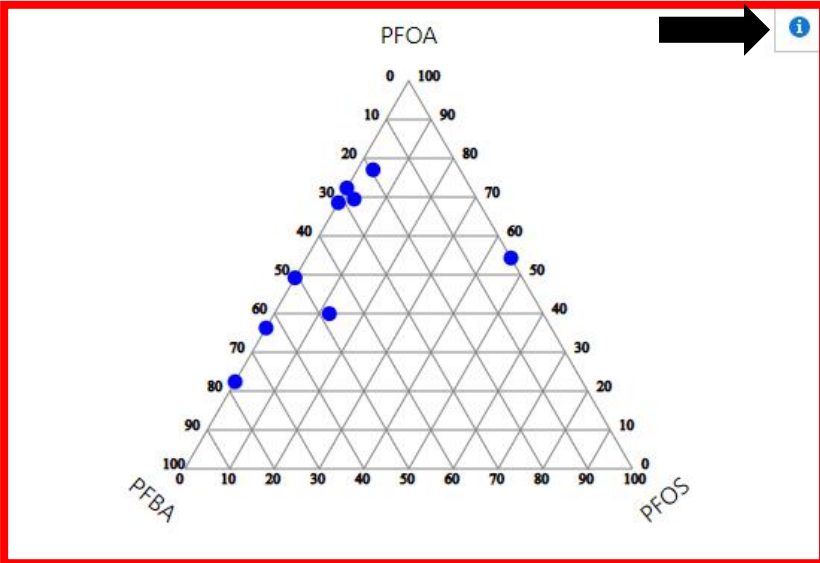


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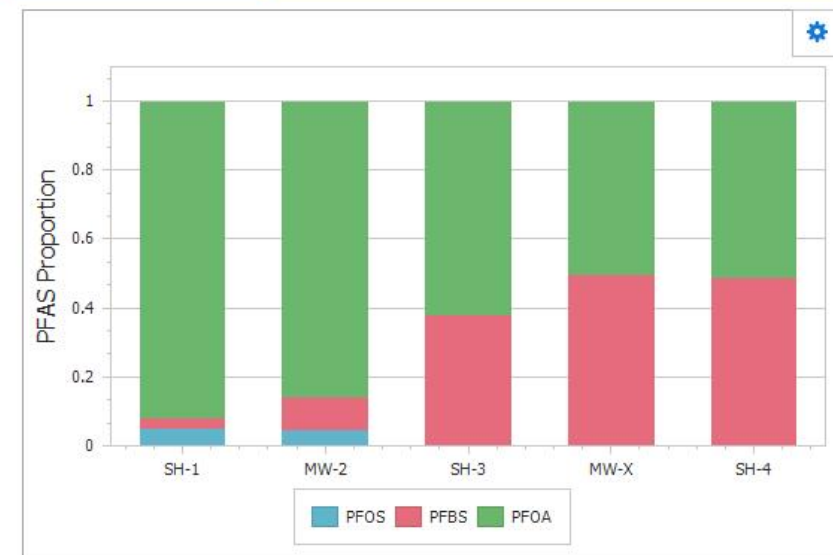
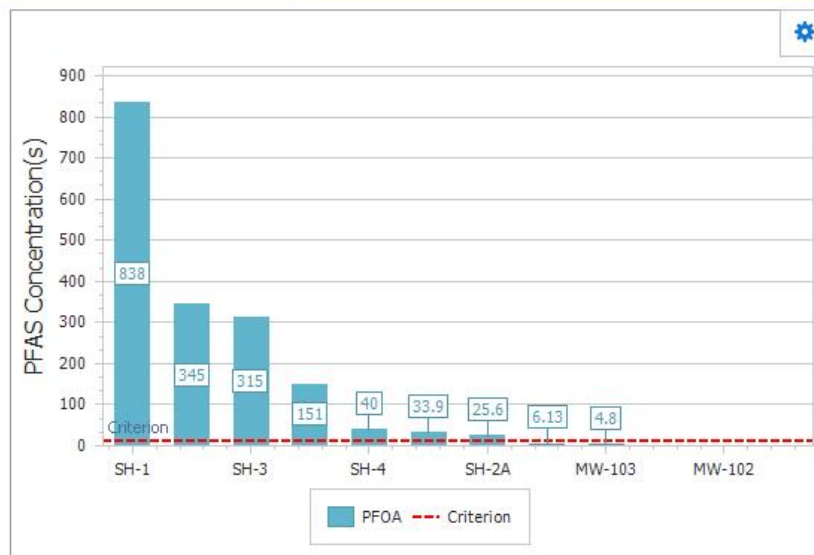
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PFAS Relative Percent Bar Chart

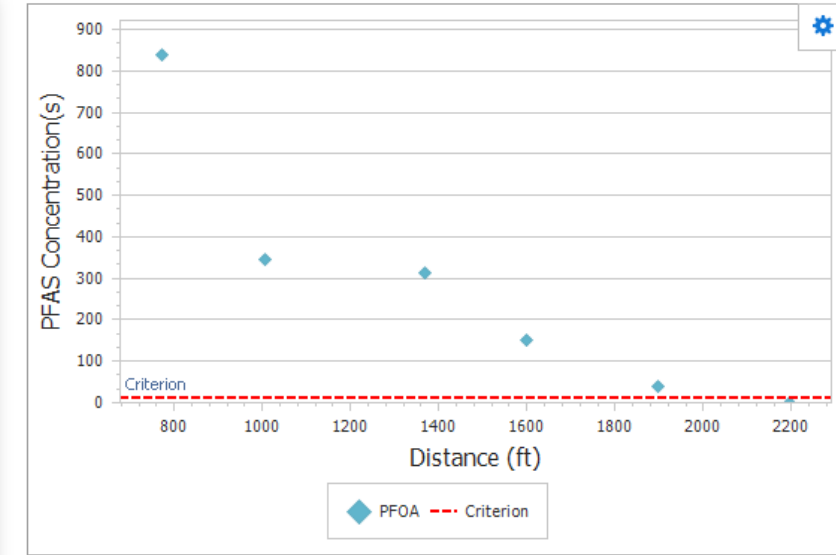
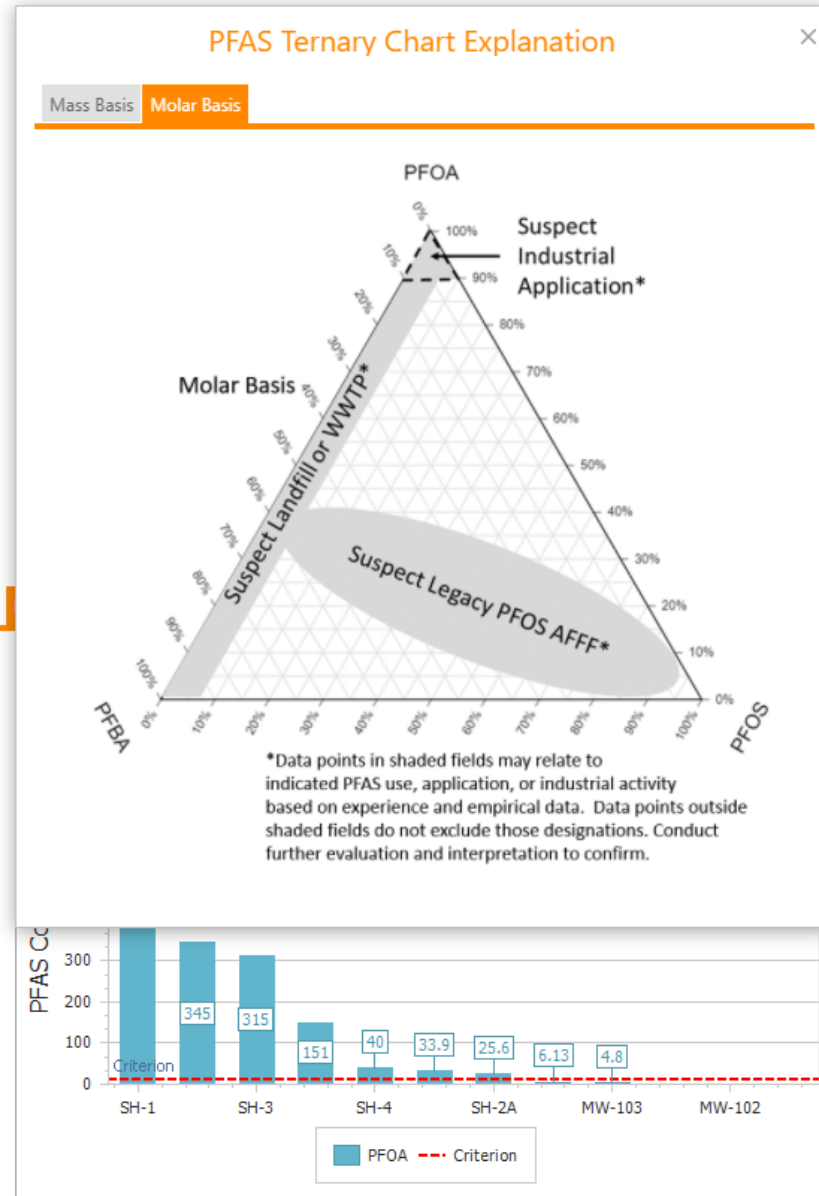
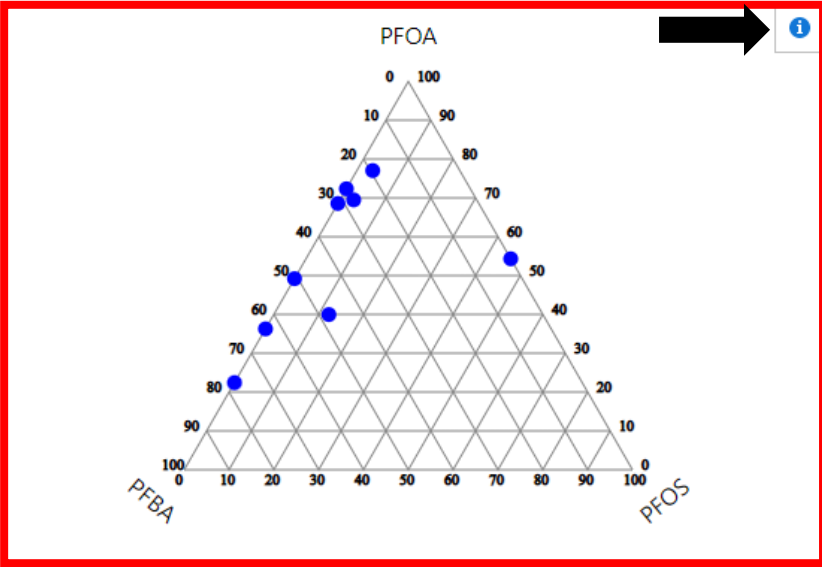


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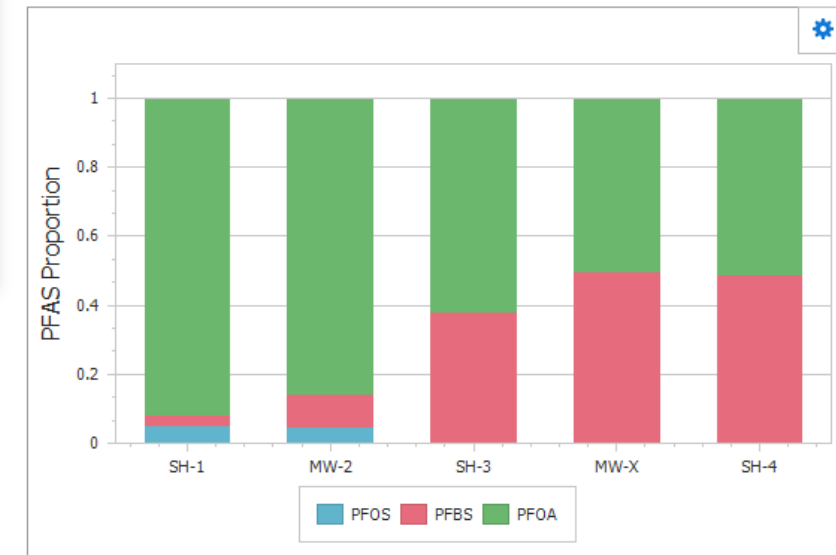
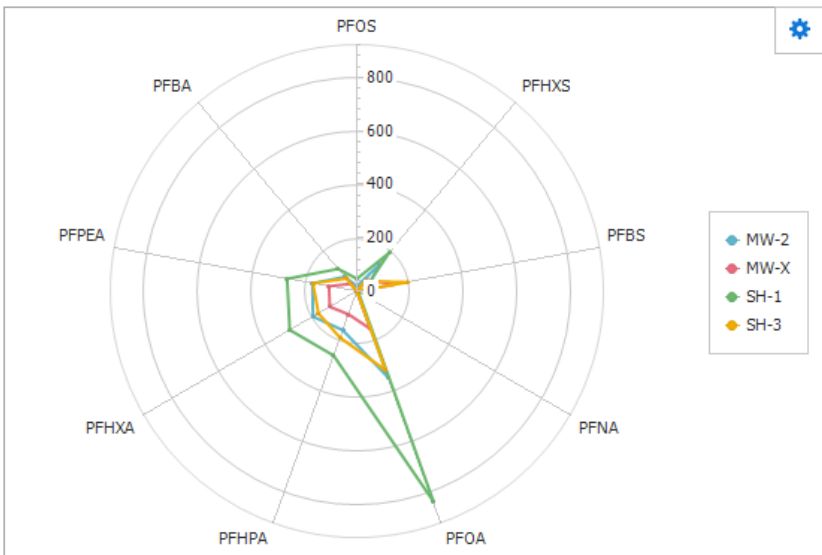
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PFAS Relative Percent Bar Chart

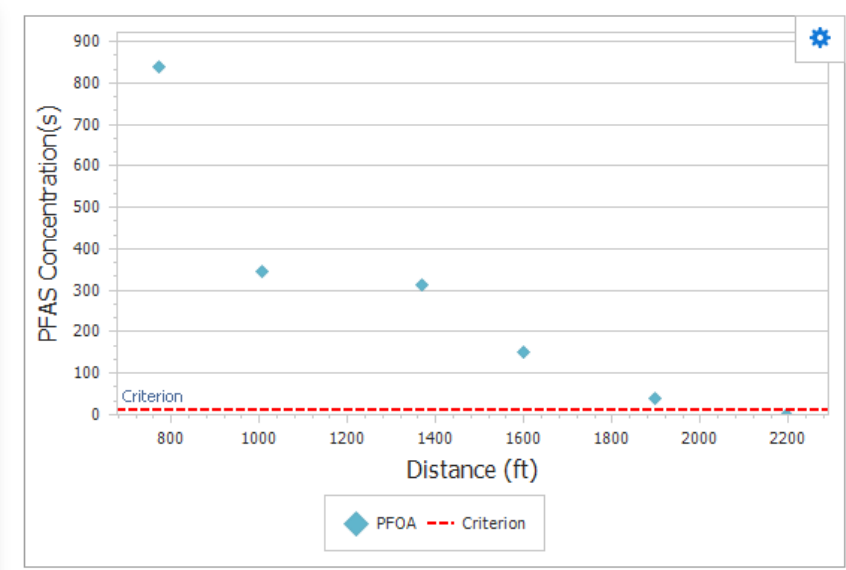
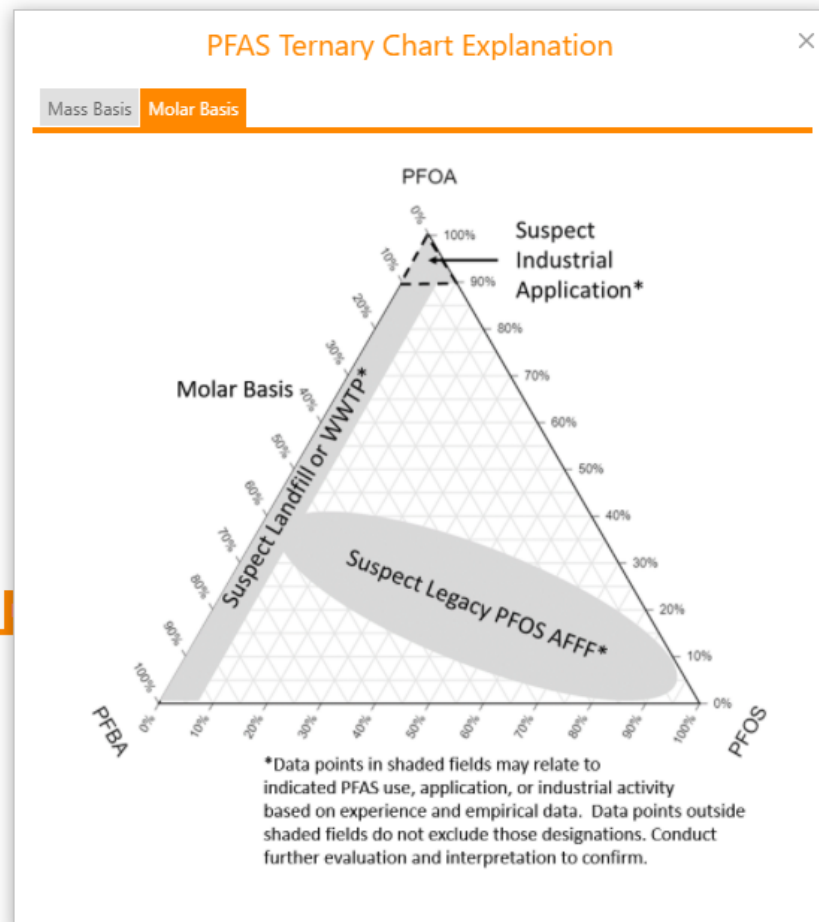
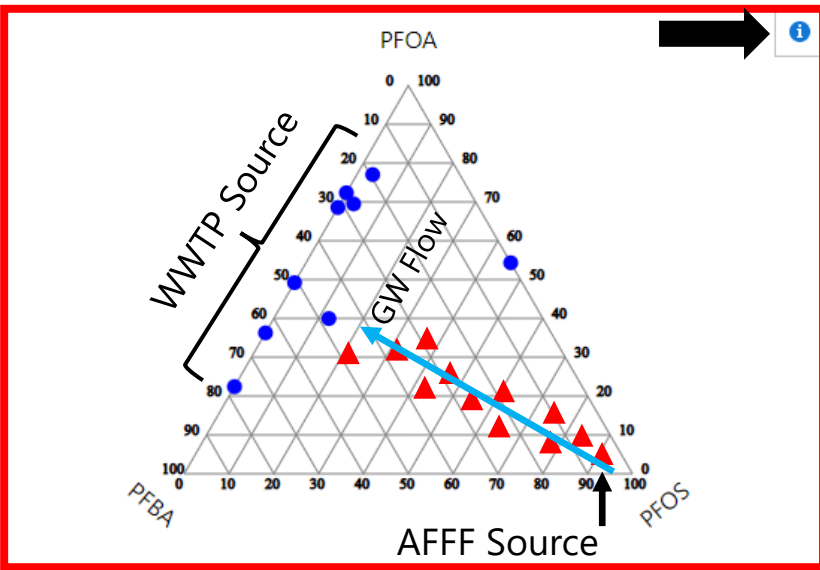


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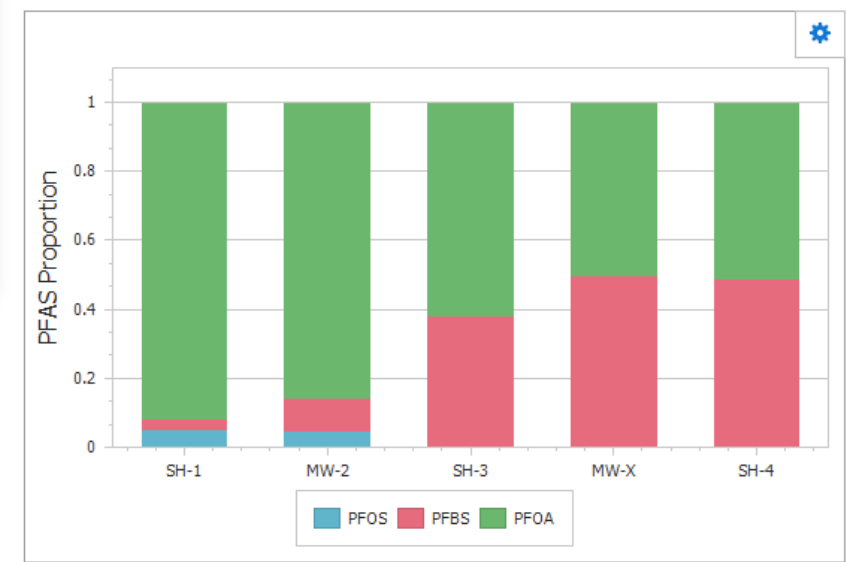
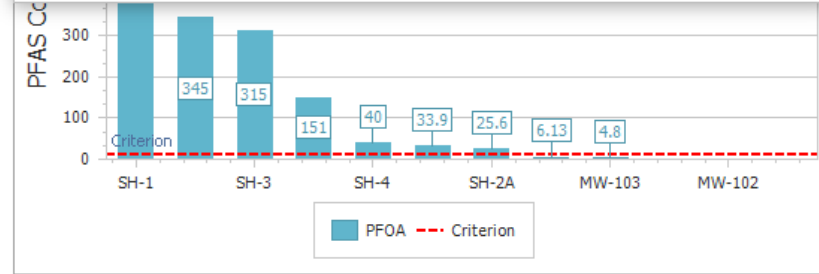
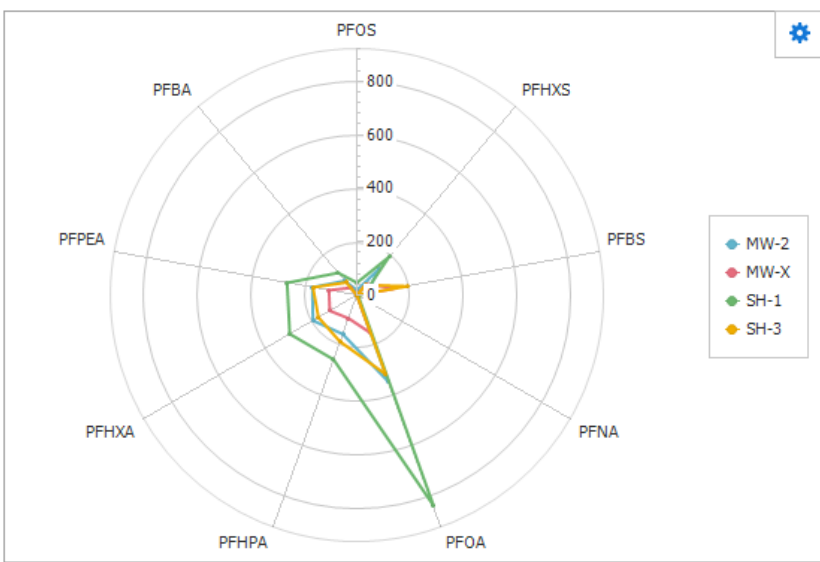
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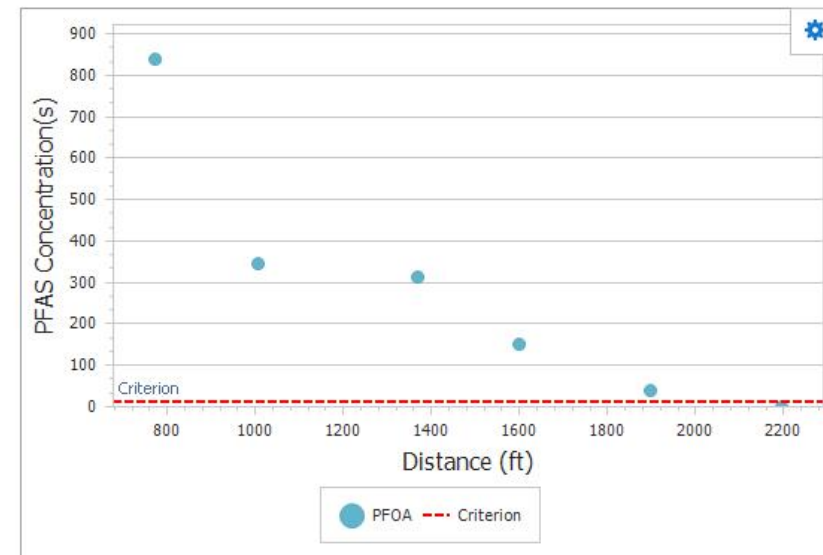
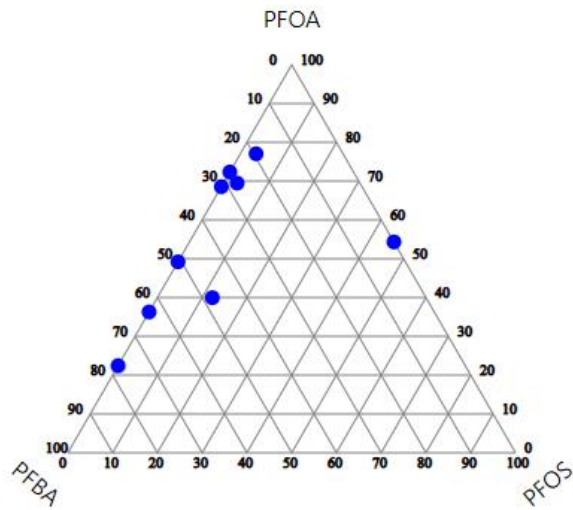


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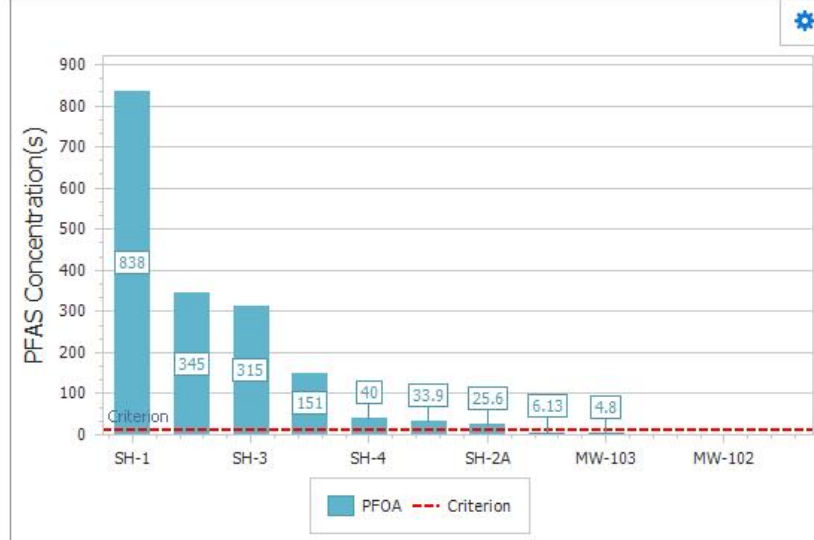
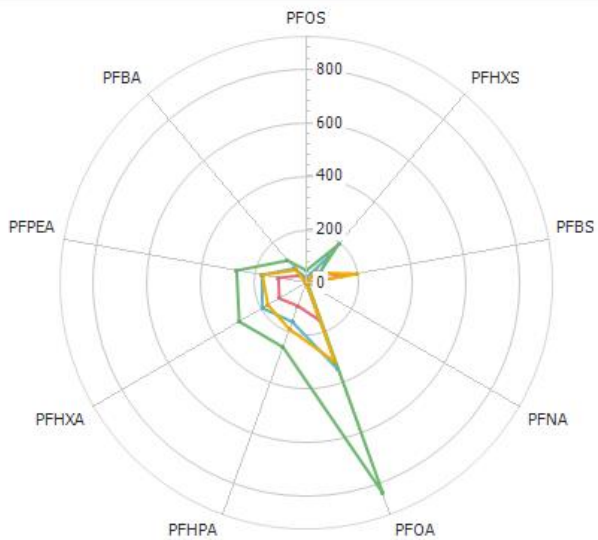
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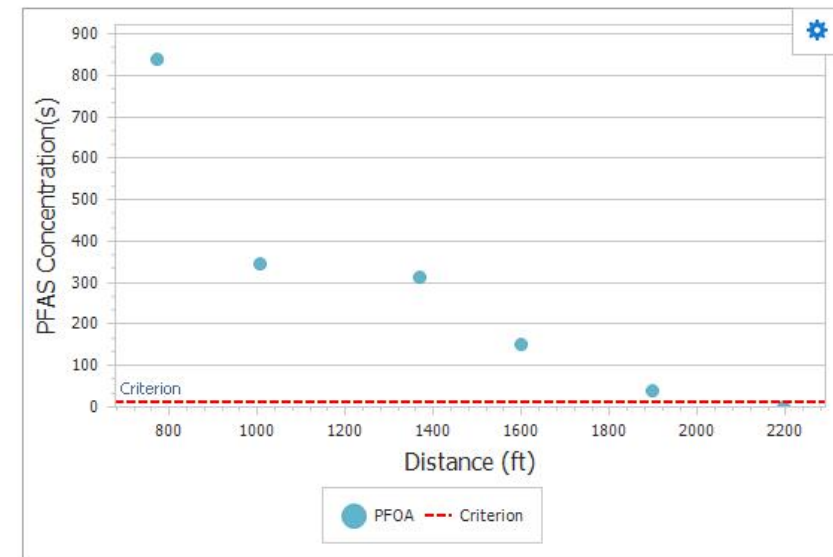
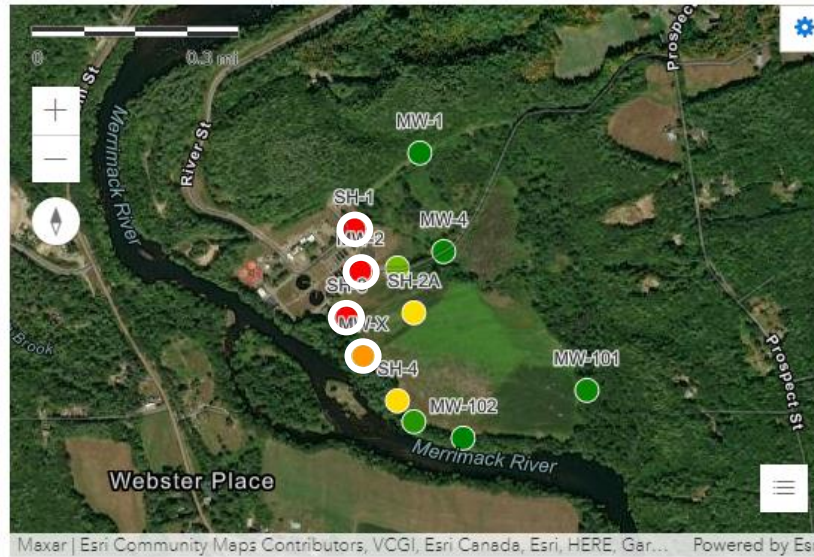
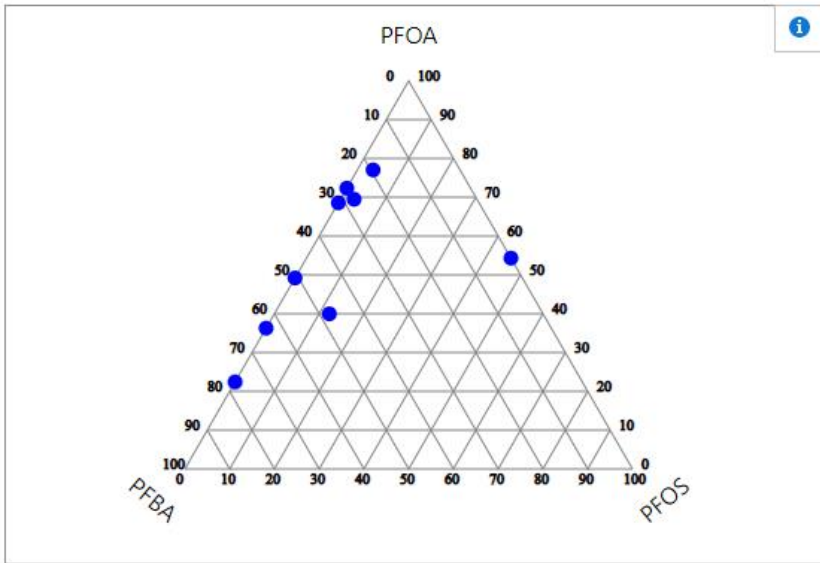


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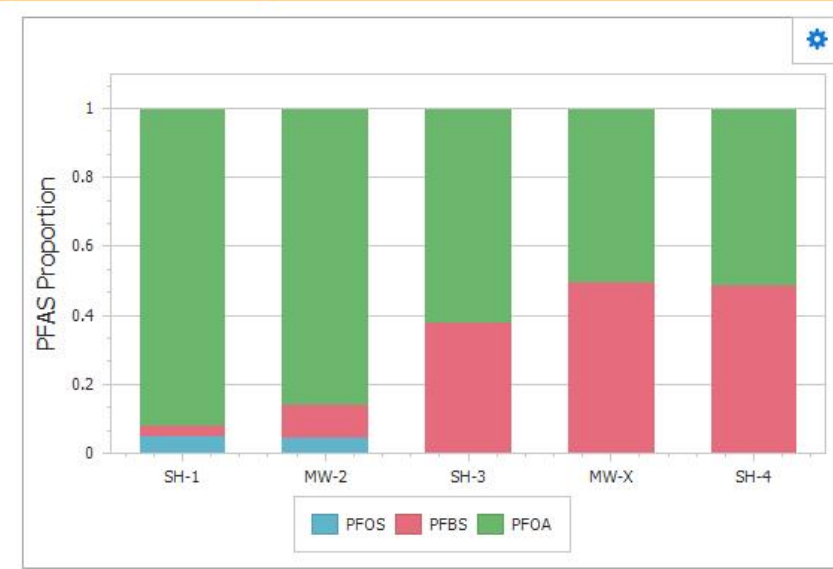
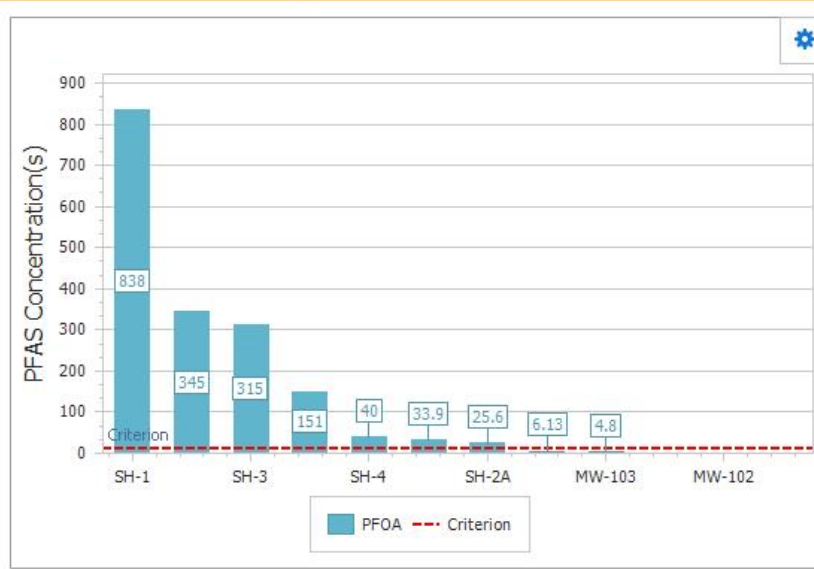
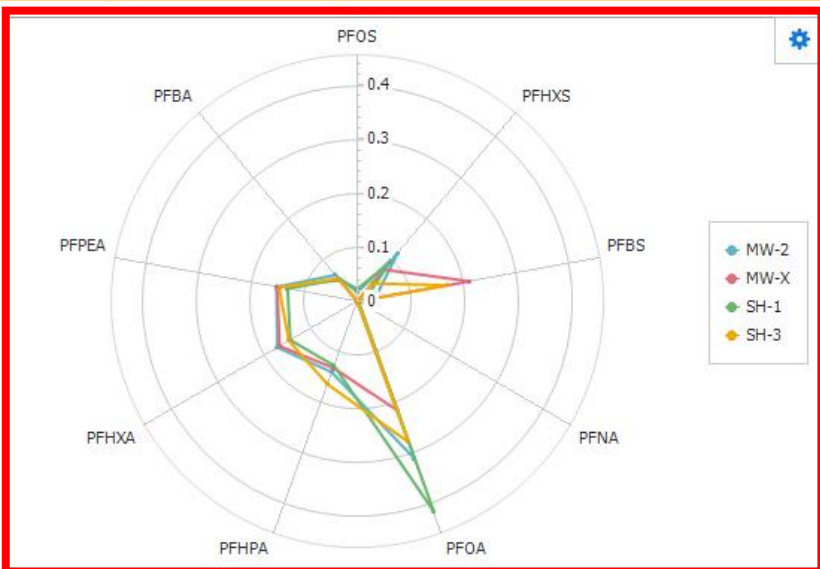
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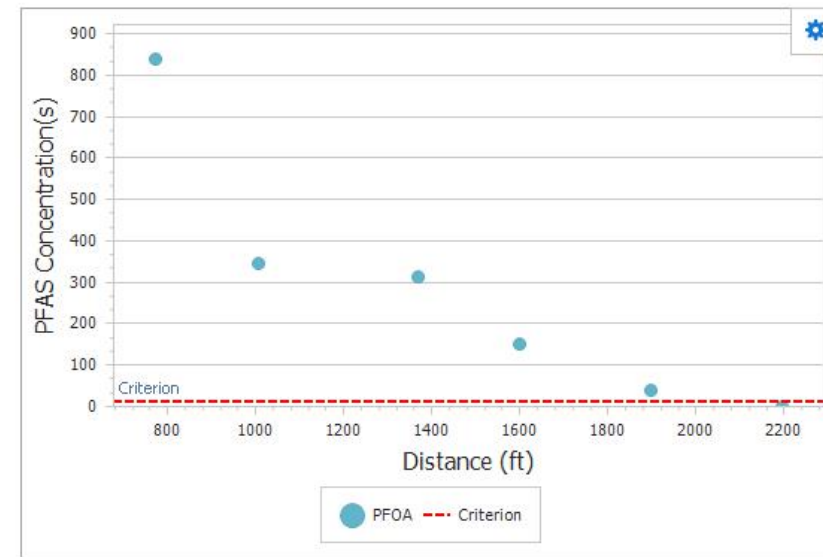
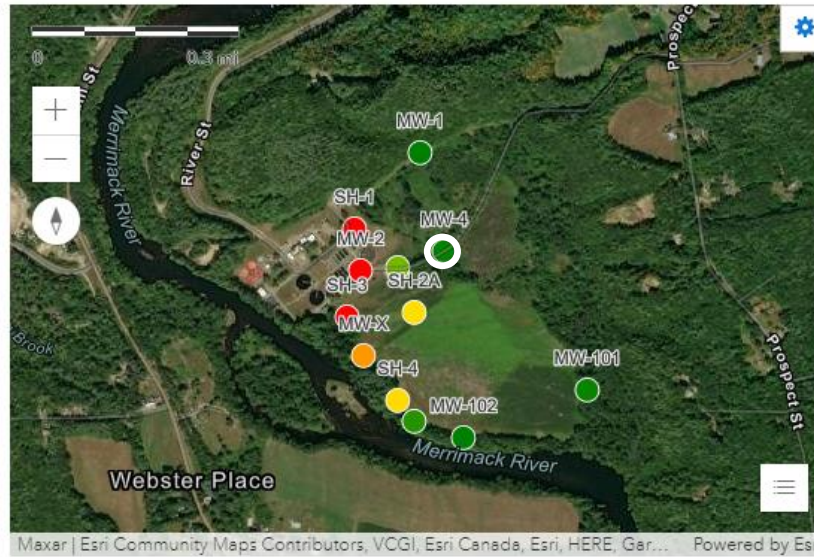
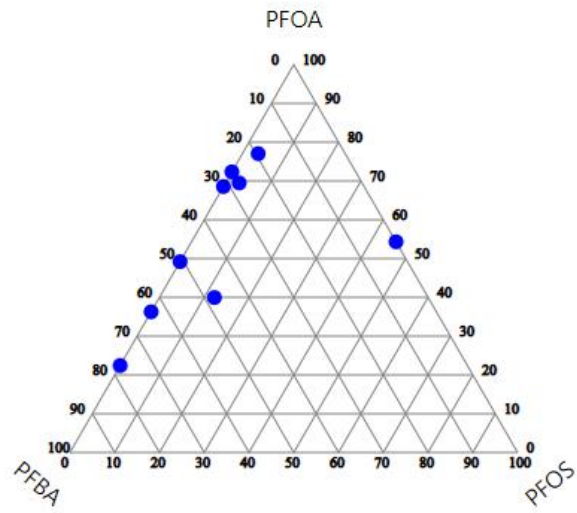


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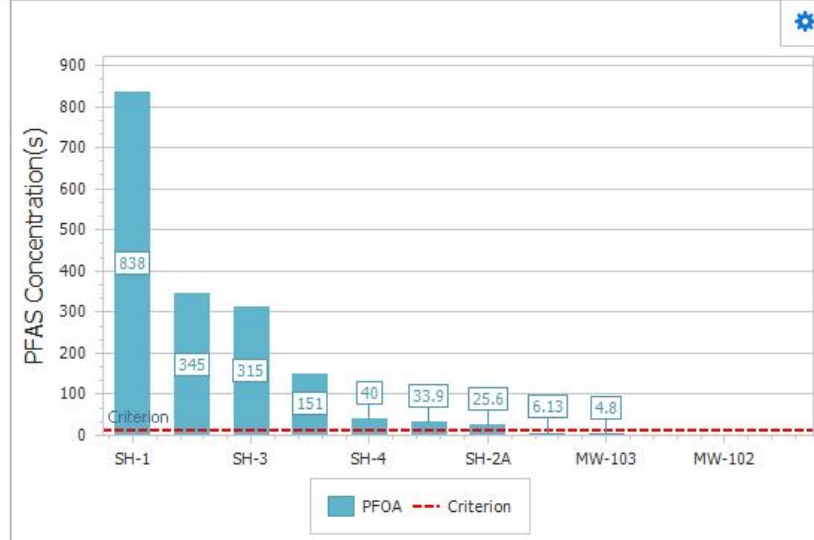
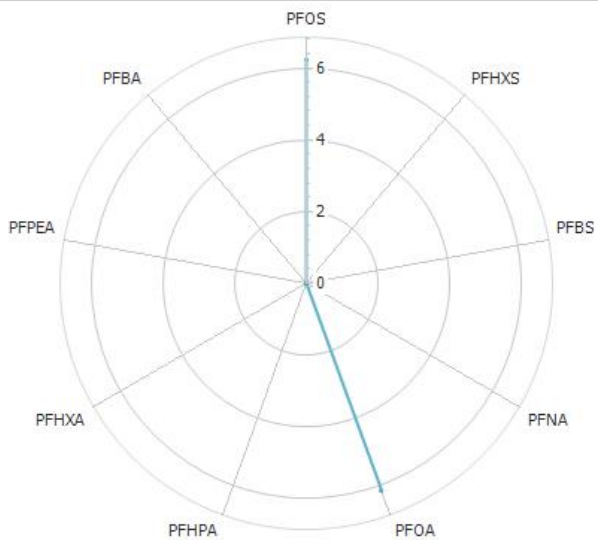
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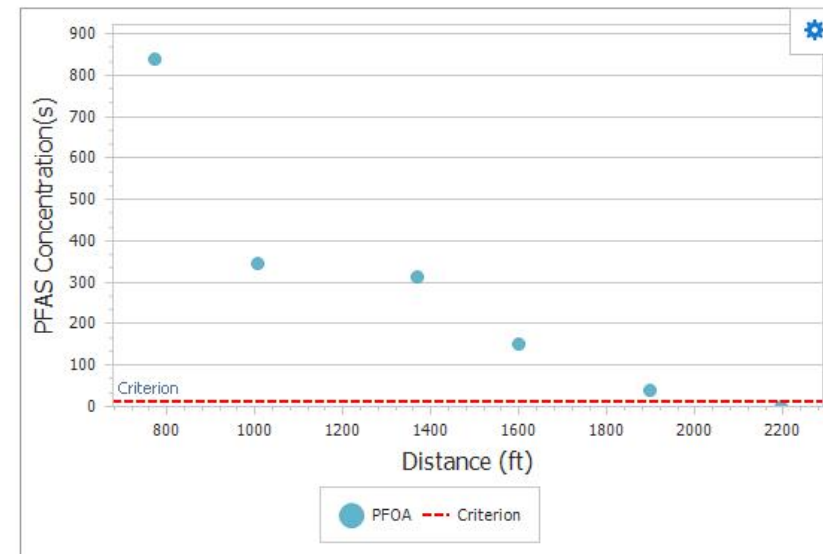
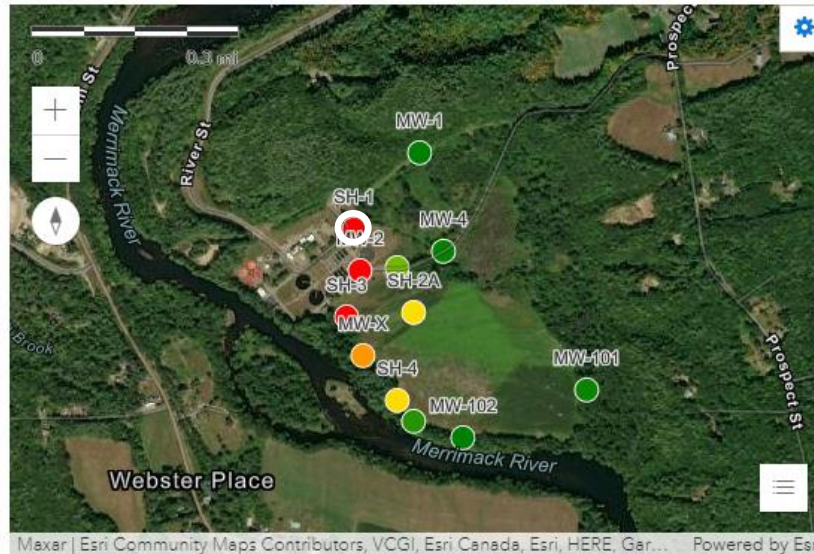
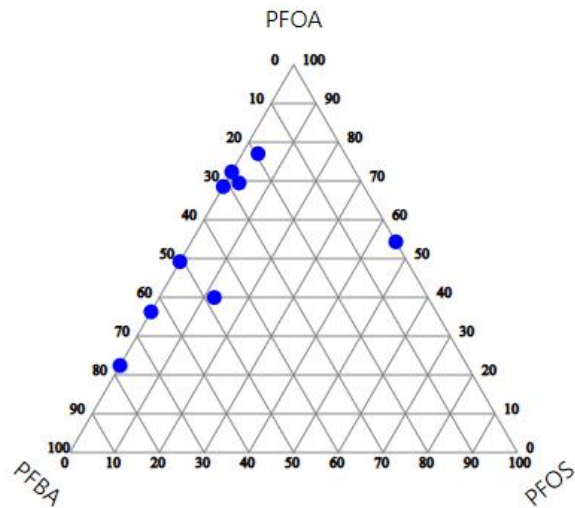


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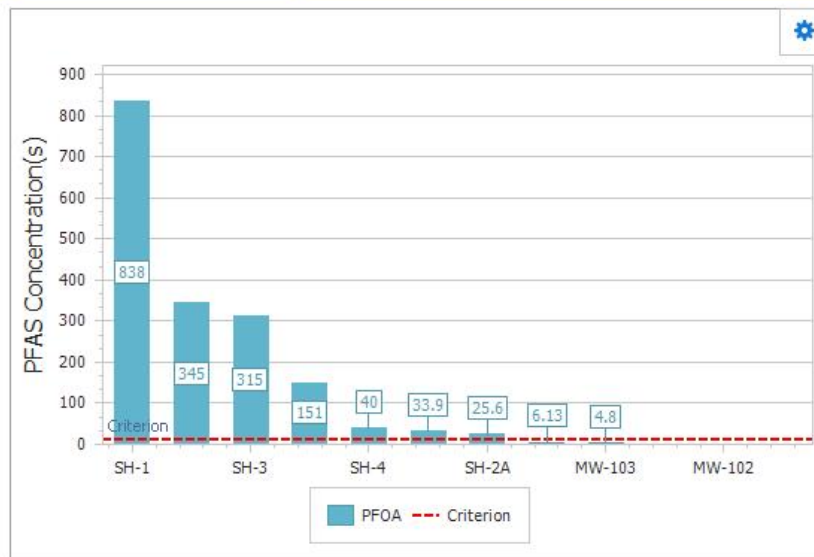
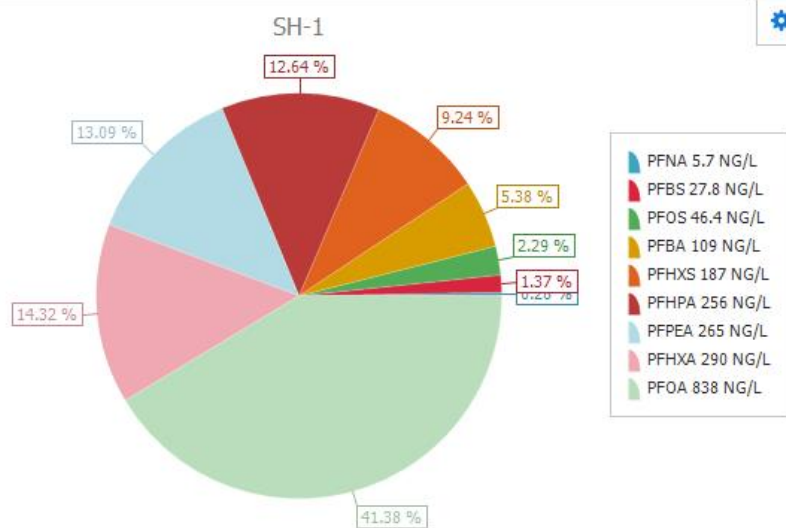
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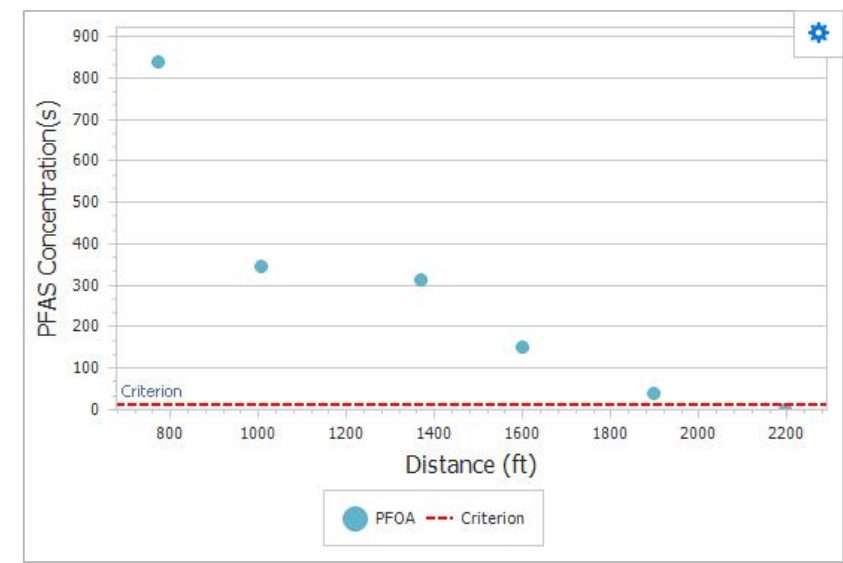
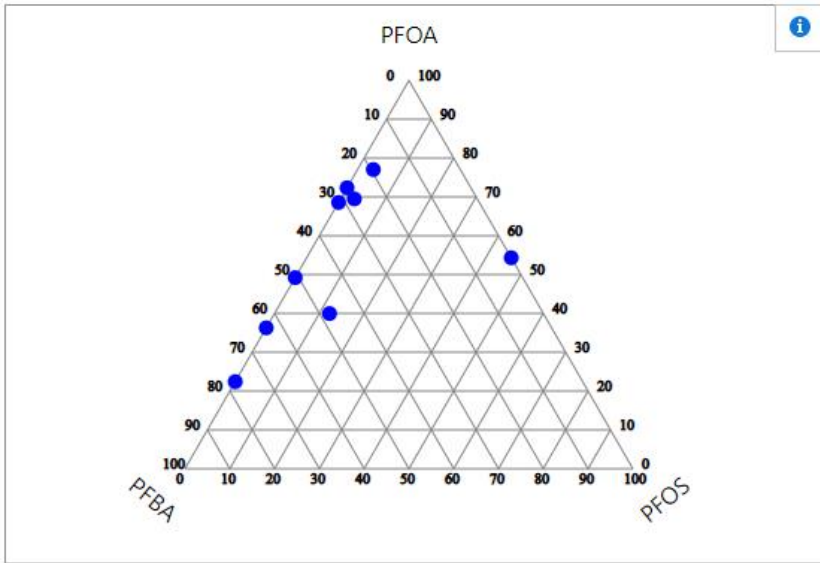


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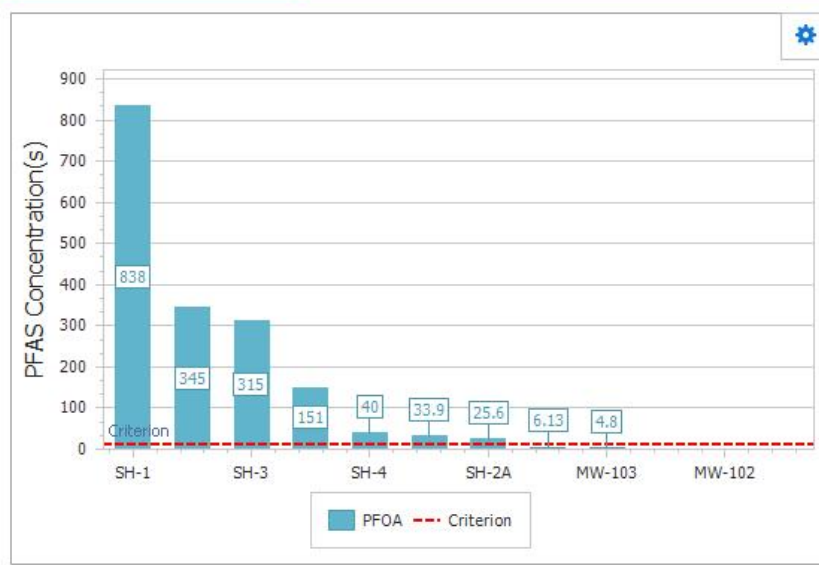
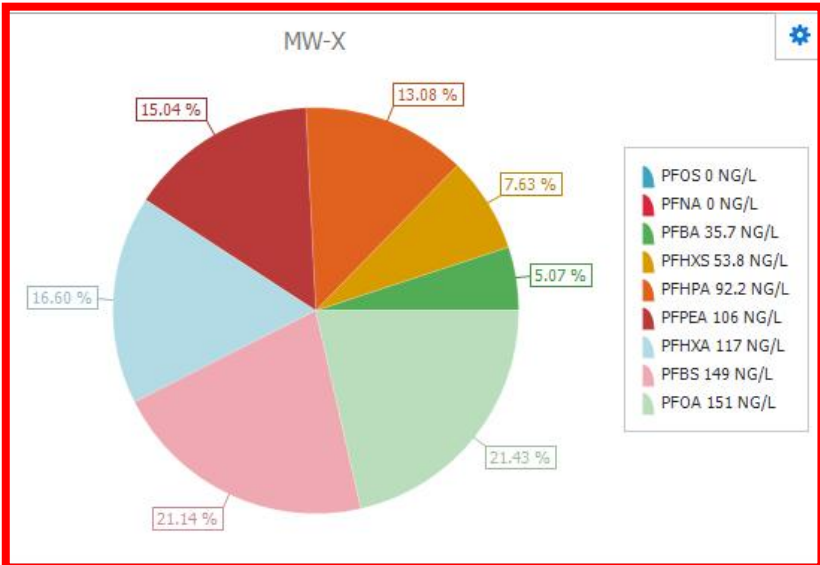
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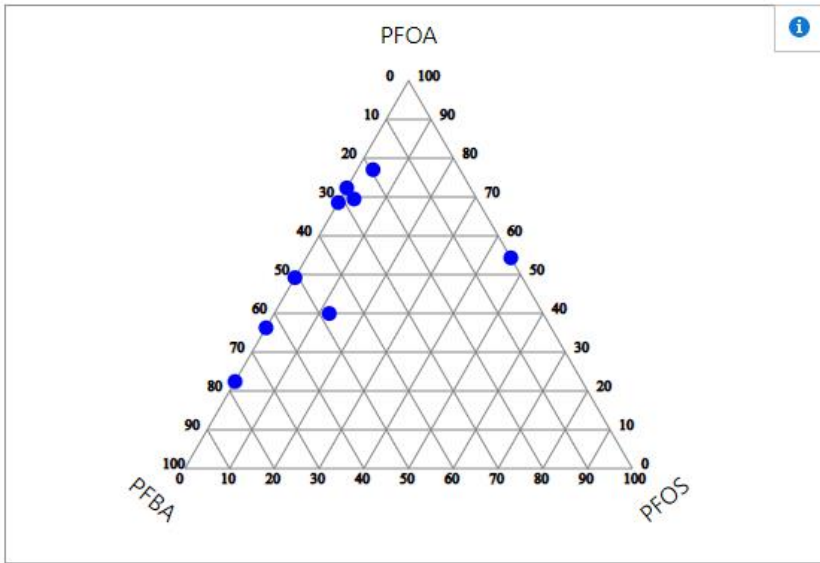
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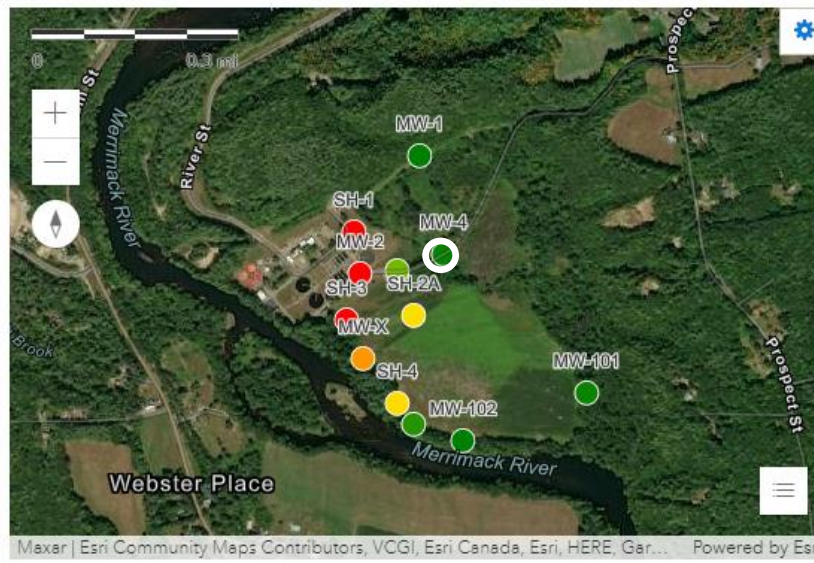
PFAS Relative Percent Bar Chart



Mass Basis Molar Basis

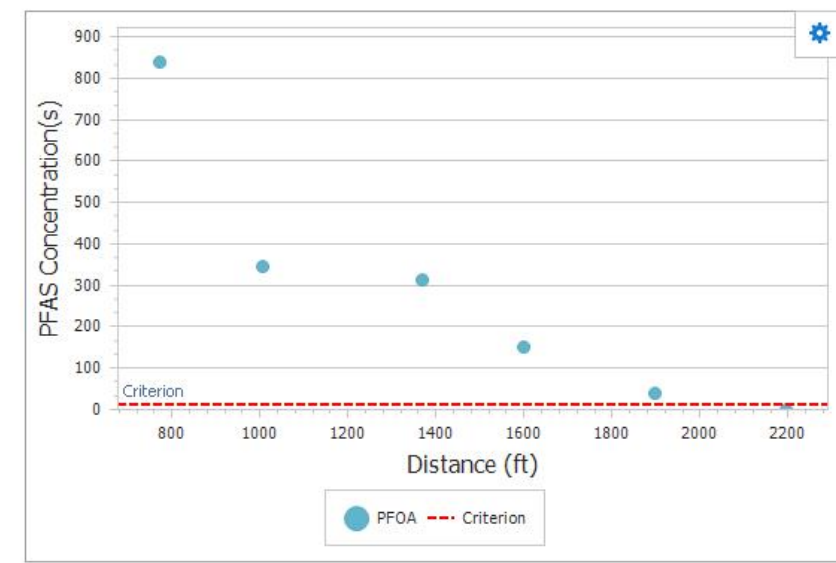


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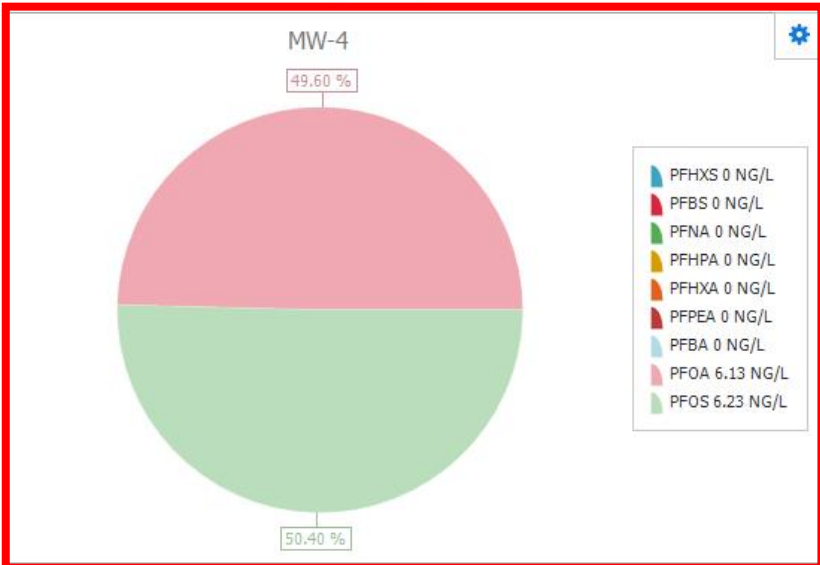


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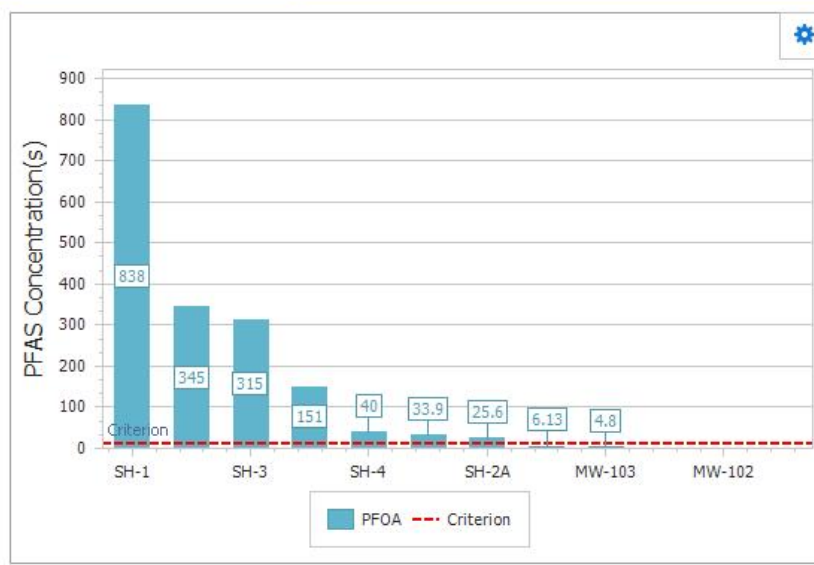
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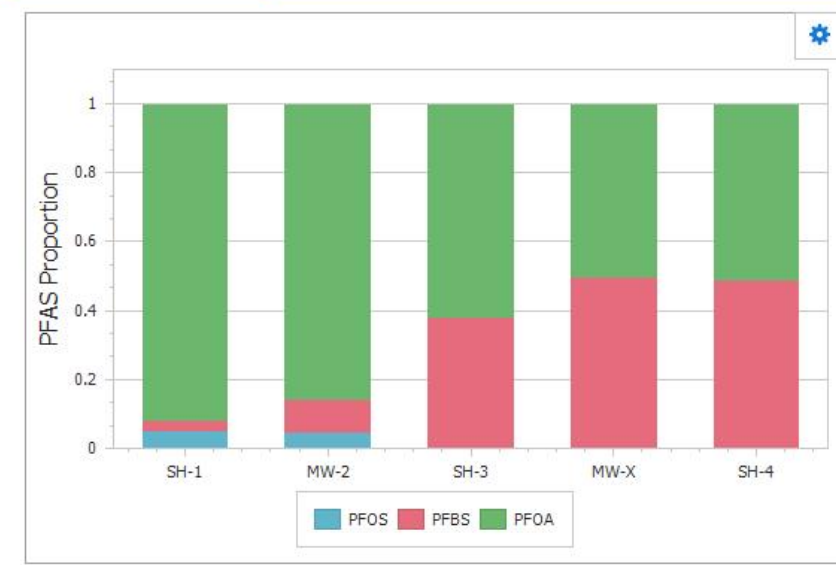
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PFAS with Concentration Distribution



PFAS Relative Percent Bar Chart

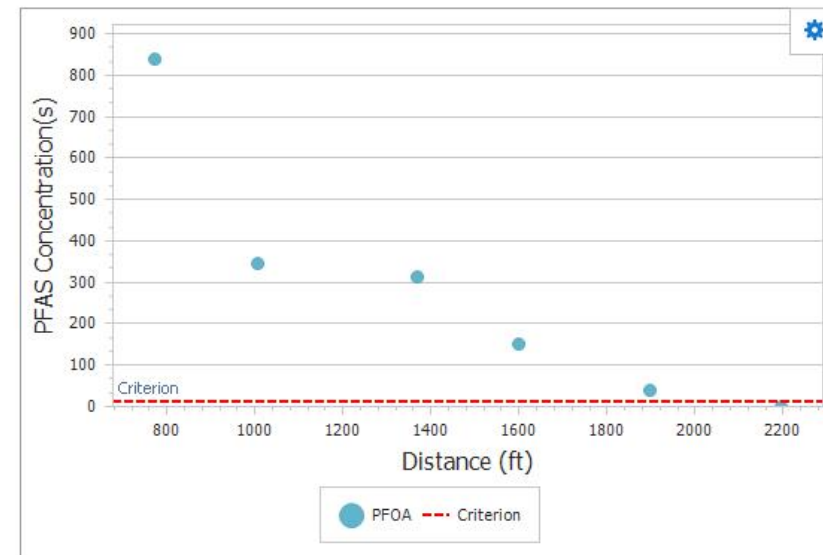
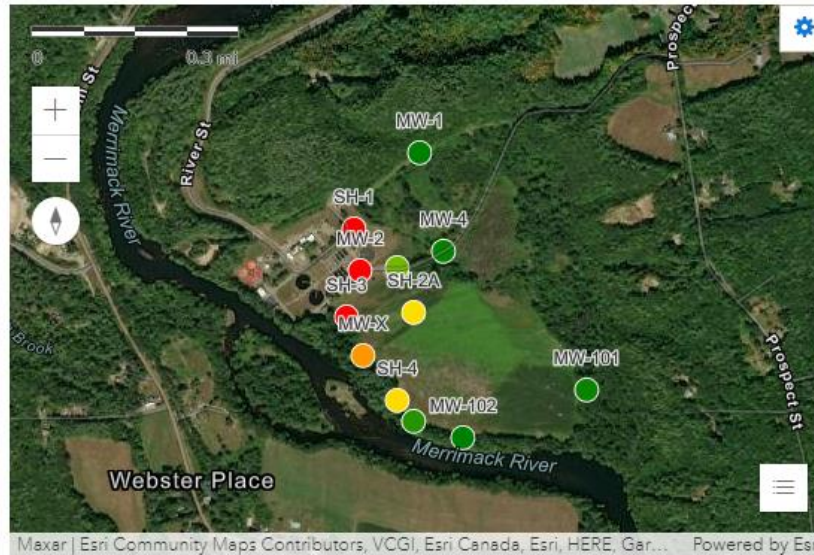
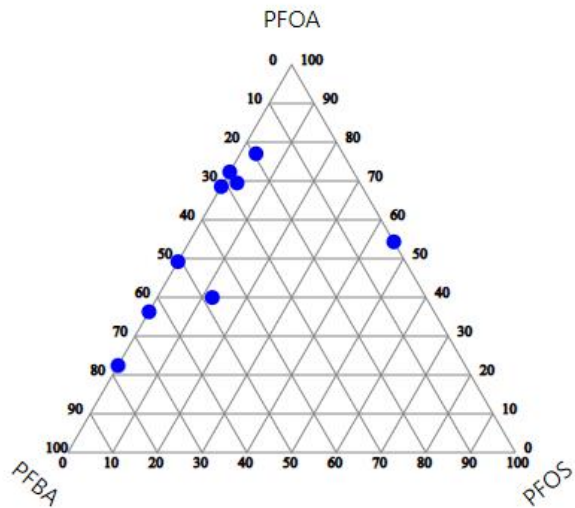


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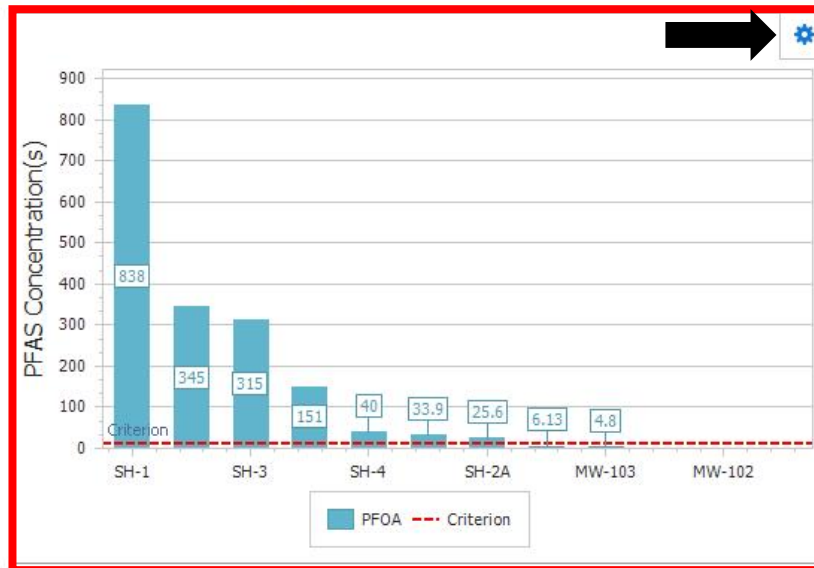
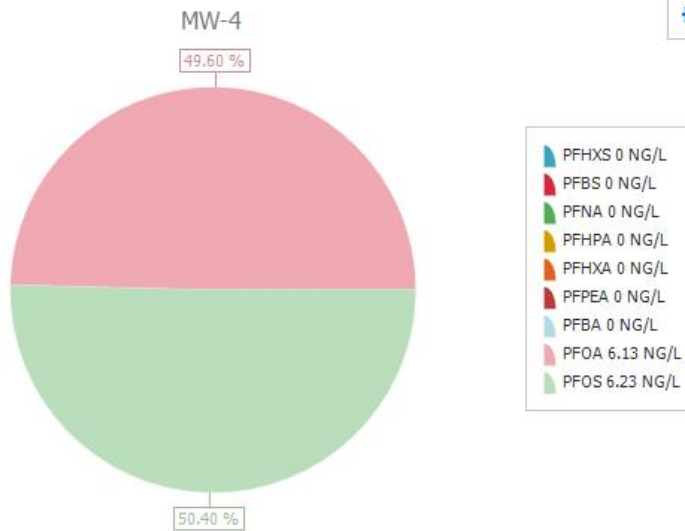
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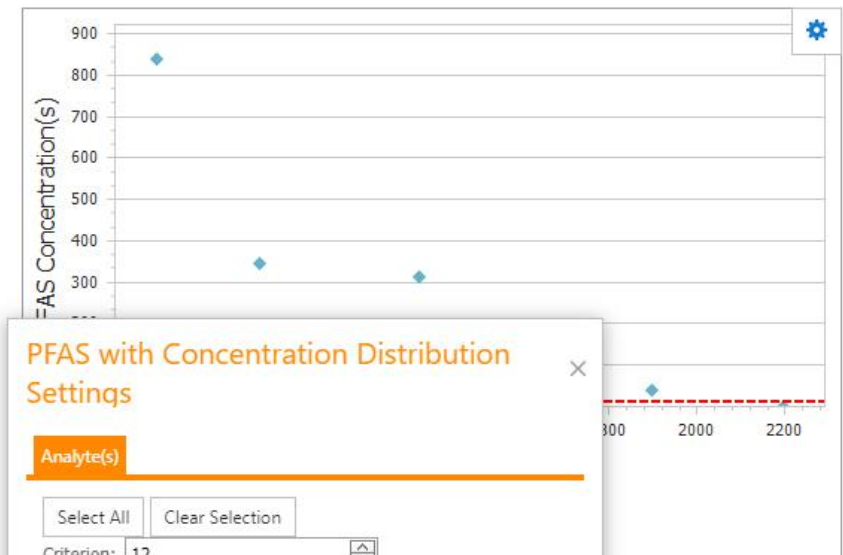
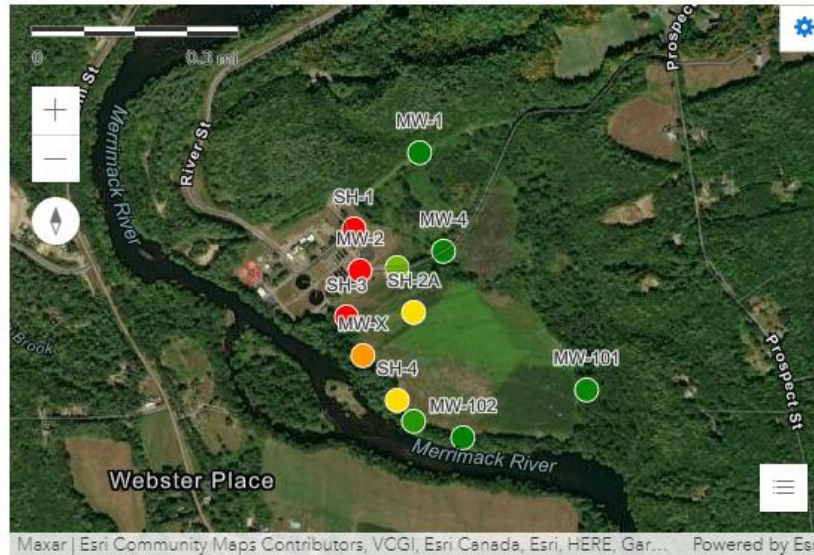
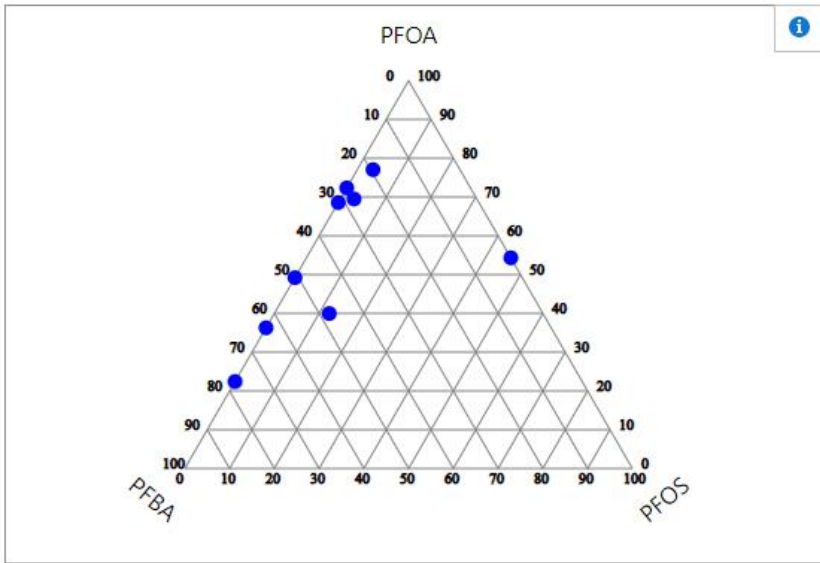


Mass Basis Molar Basis

Area Map

Distance vs. PFAS Concentration

Source Well: MW-1



PFAS with Concentration Distribution Settings

Analyte(s)

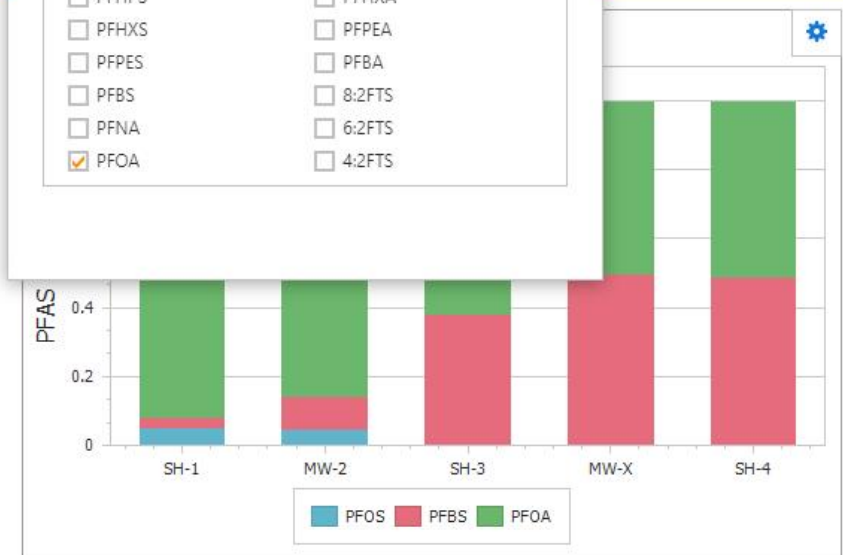
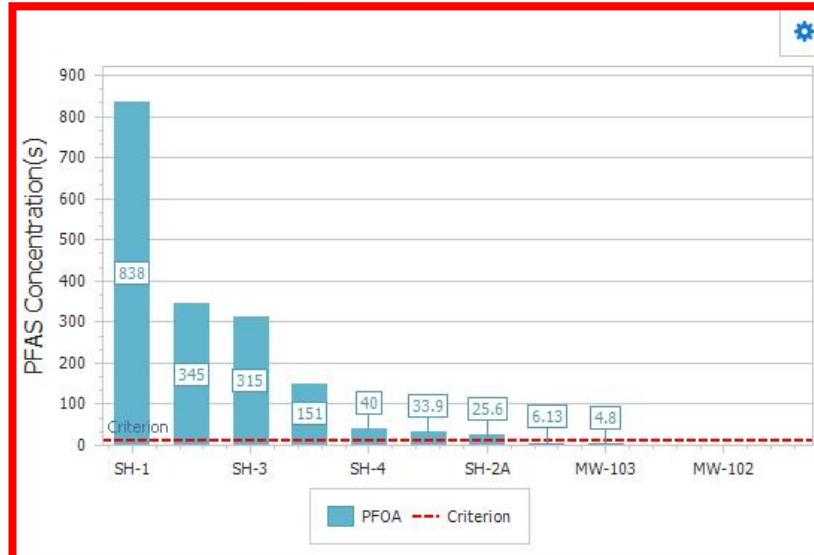
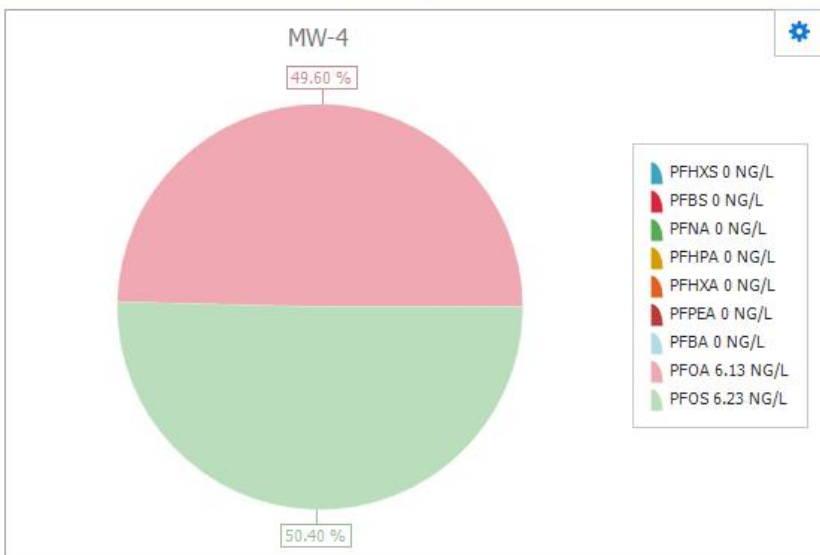
Select All Clear Selection

Criterion: 12

- PFOS
- PFHPS
- PFHXS
- PFPES
- PFBS
- PFNA
- PFOA
- PFHPA
- PFHXA
- PFPEA
- PFBA
- 8:2FTS
- 6:2FTS
- 4:2FTS

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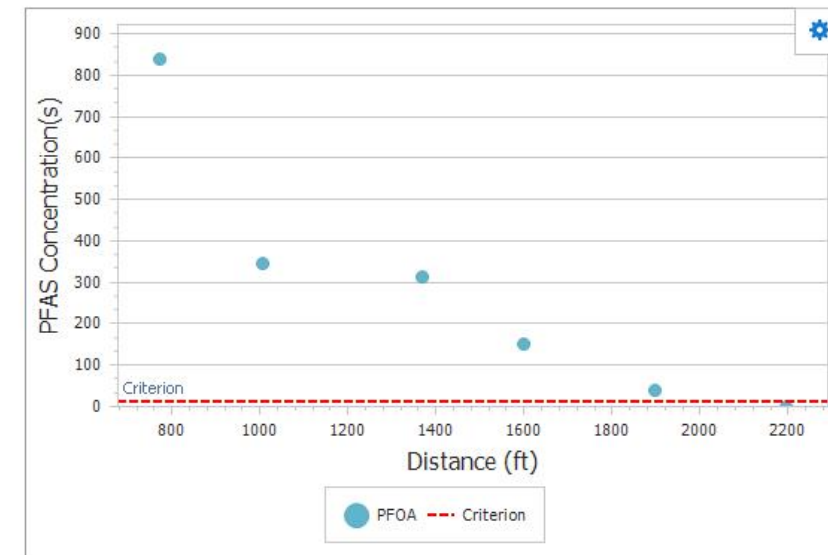
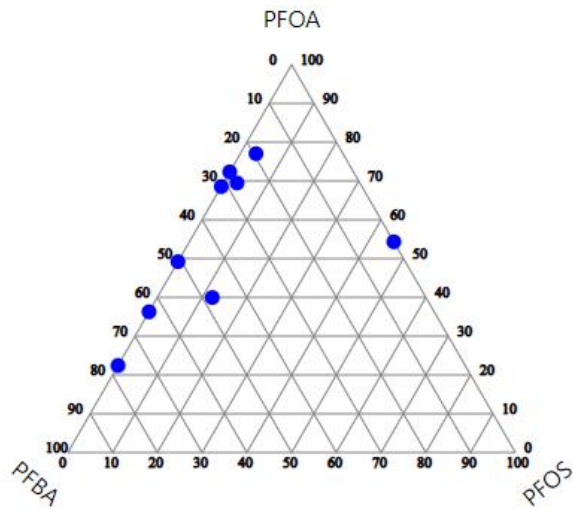


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Distance vs. PFAS Concentration

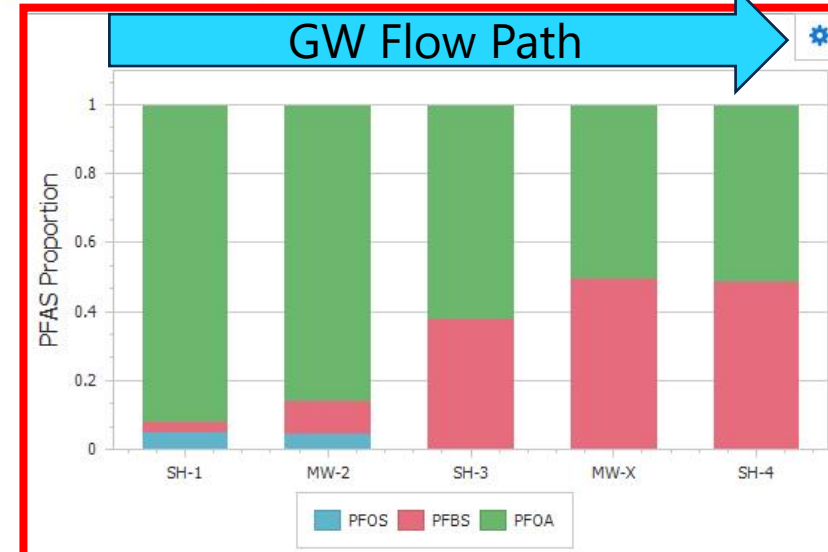
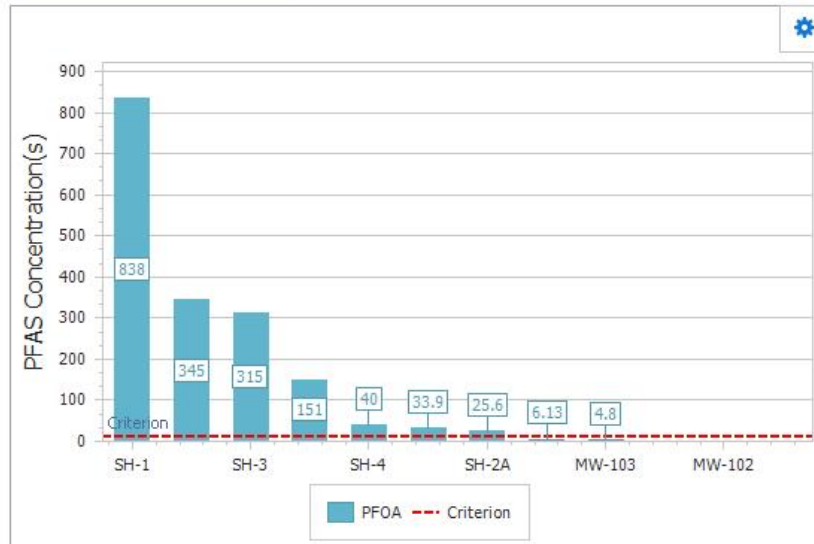
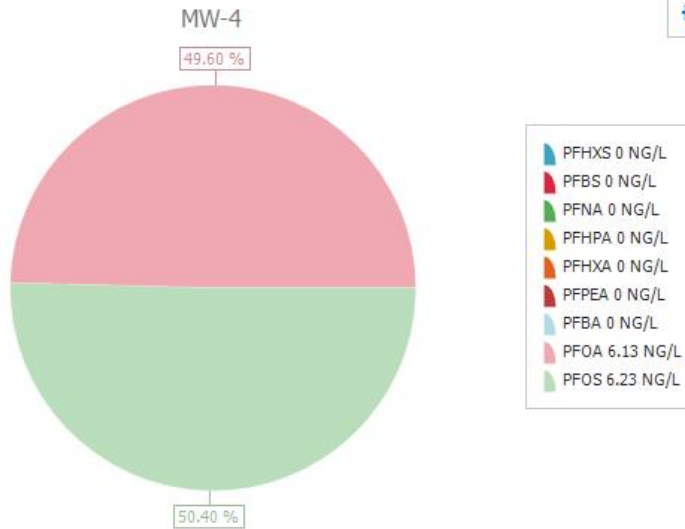
Source Well: MW-1



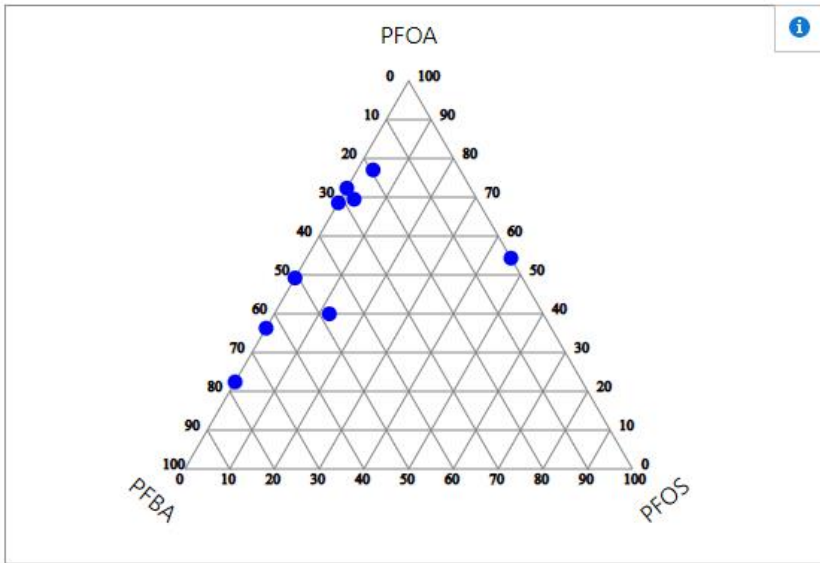
Radar Diagram Normalized Radar Chart Pie Chart

PFAS with Concentration Distribution

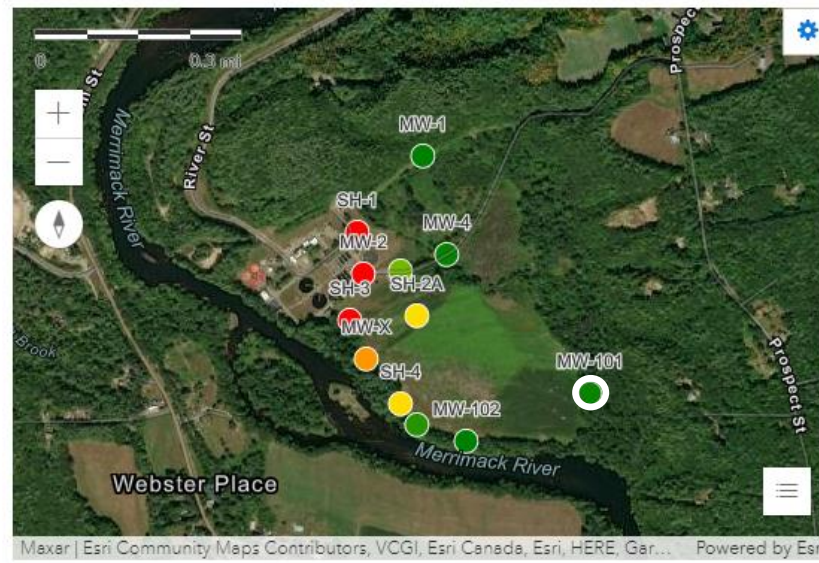
PFAS Relative Percent Bar Chart



Mass Basis Molar Basis

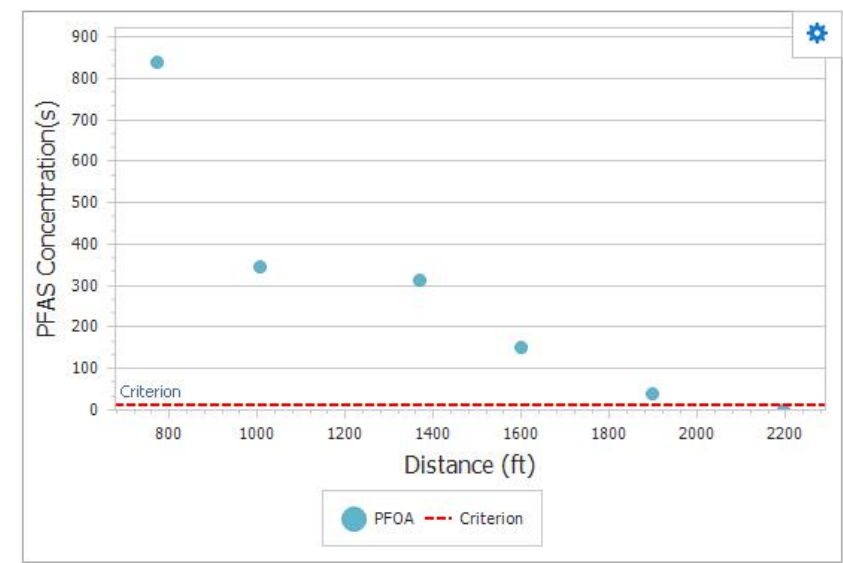


Area Map

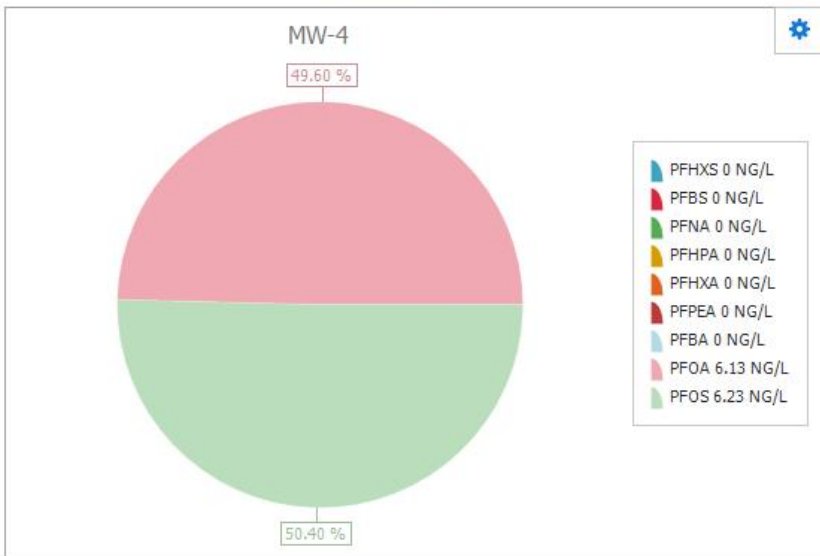


Distance vs. PFAS Concentration

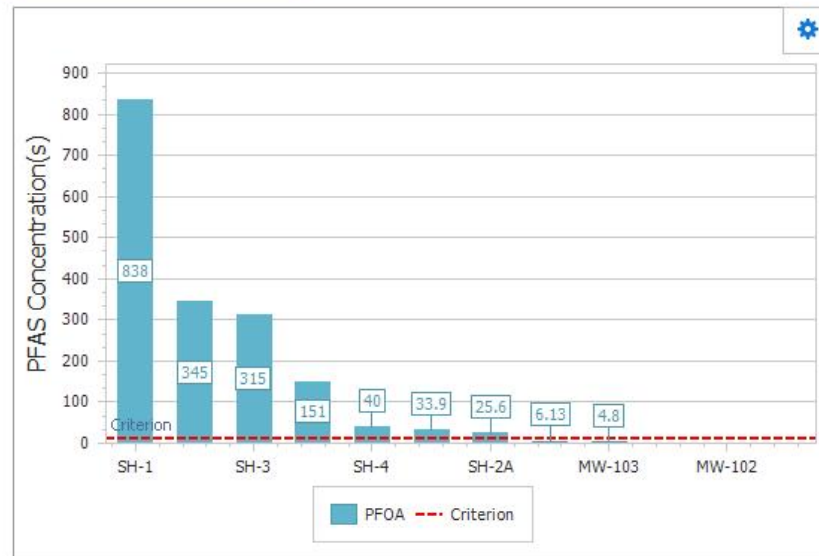
Source Well: MW-1



Radar Diagram Normalized Radar Chart Pie Chart



PFAS with Concentration Distribution



PFAS Relative Percent Bar Chart

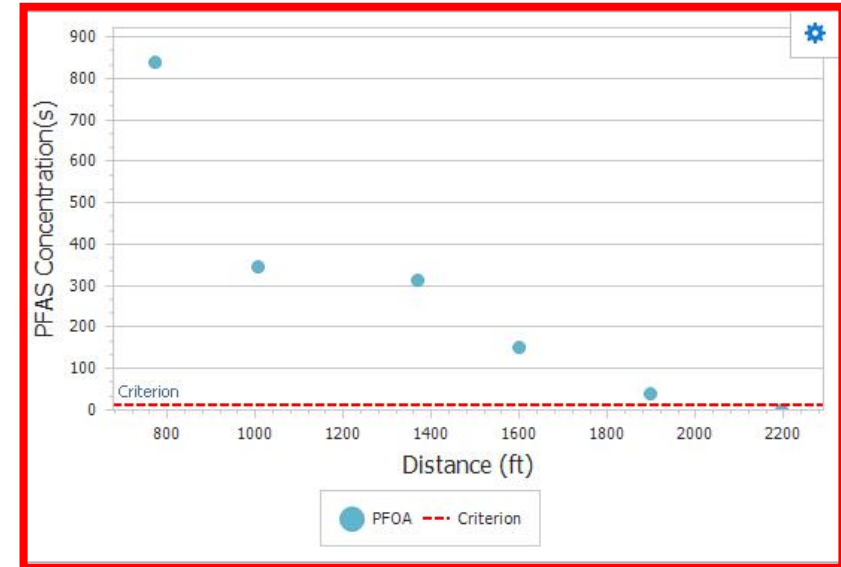
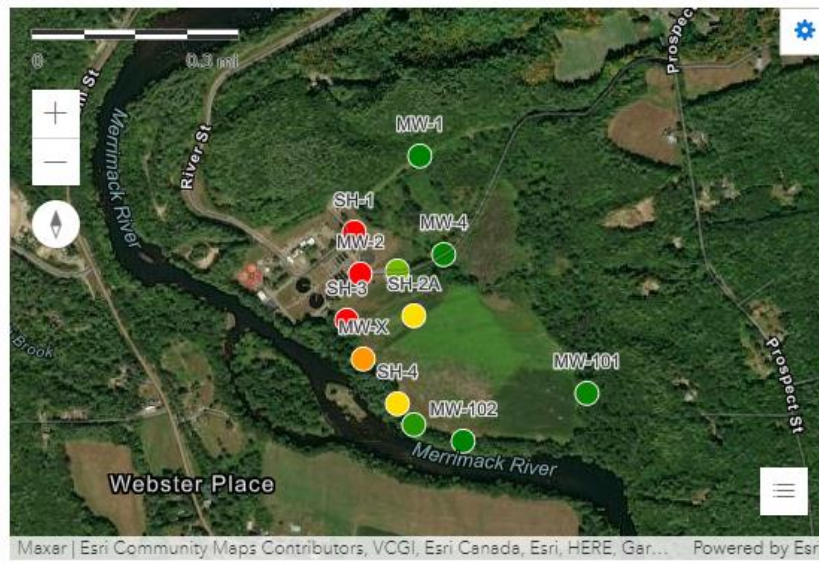
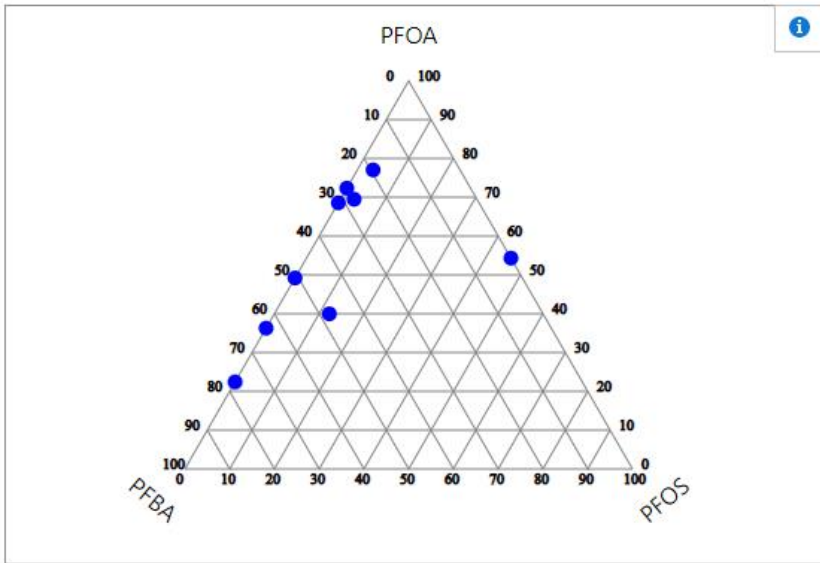


Mass Basis Molar Basis

Area Map

Distance vs. PFAS Concentration

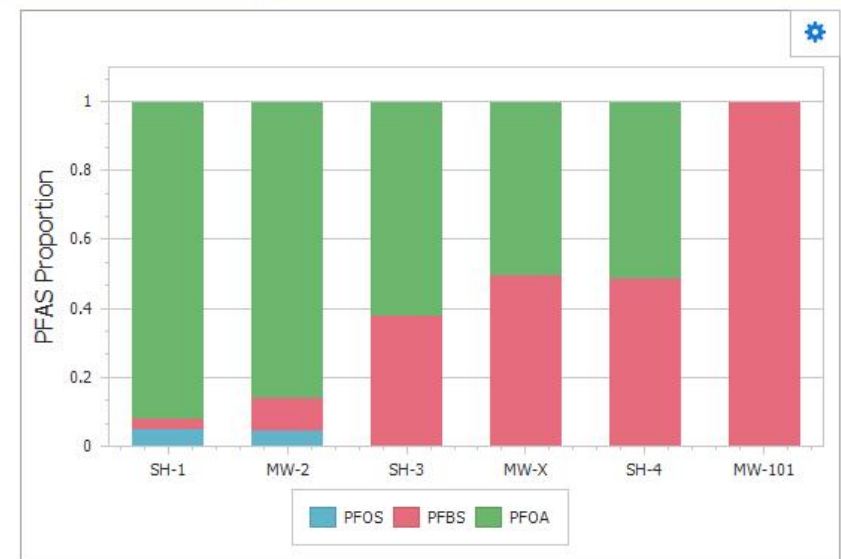
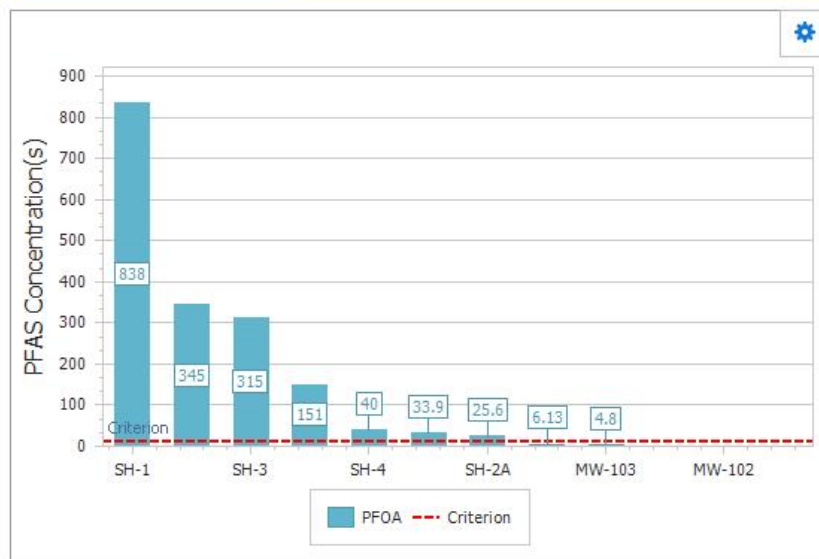
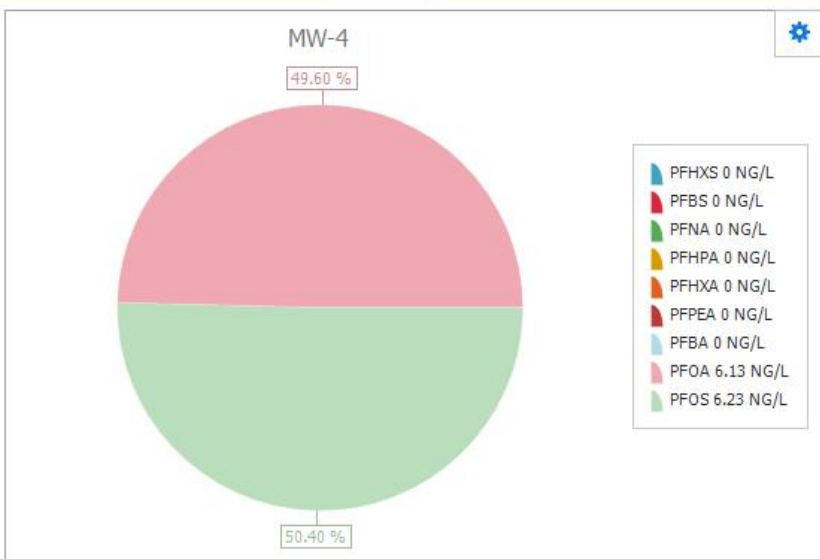
Source Well: MW-1



Radar Diagram Normalized Radar Chart Pie Chart

PFAS with Concentration Distribution

PFAS Relative Percent Bar Chart

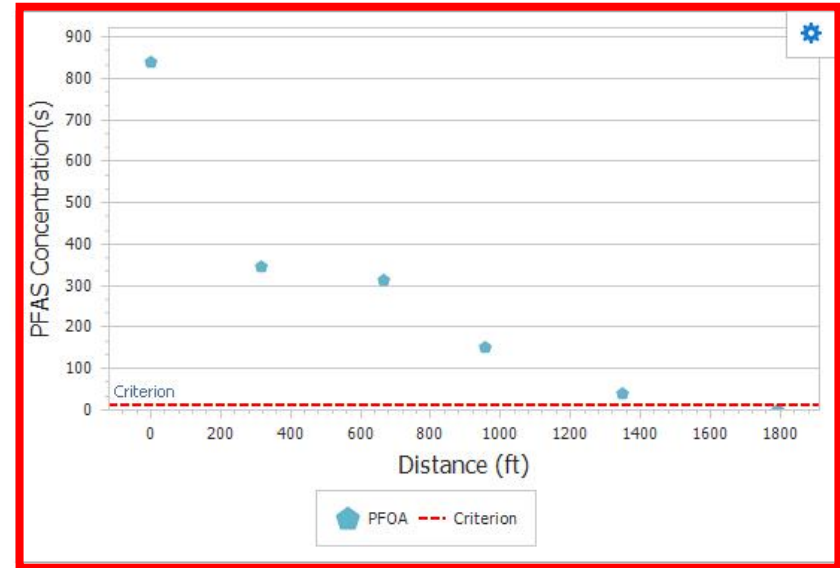
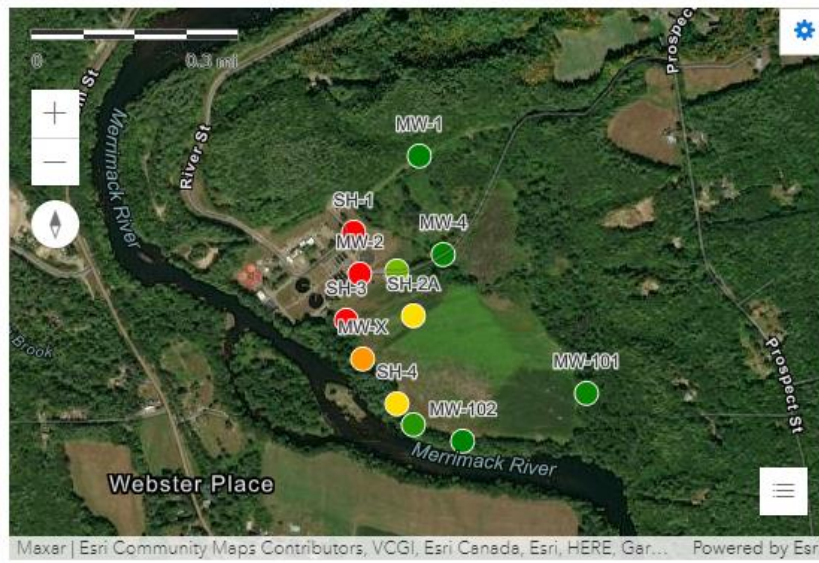
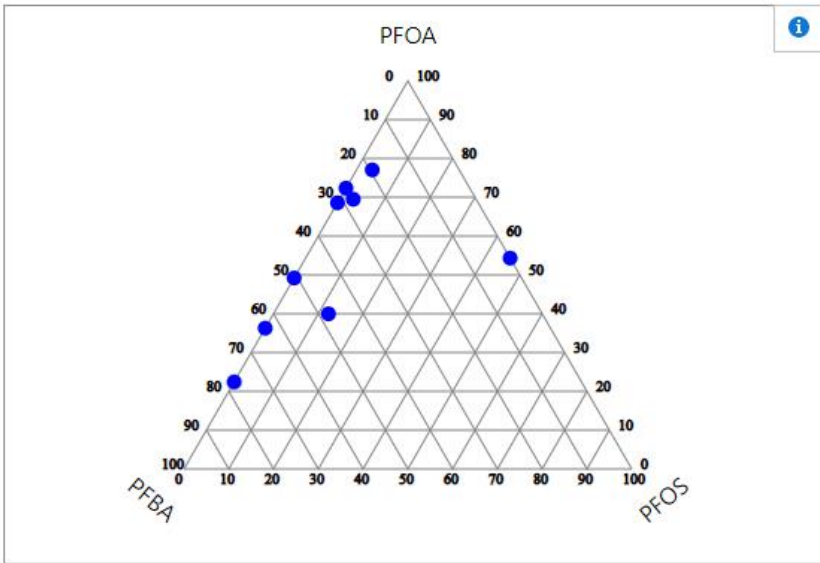


Mass Basis Molar Basis

Area Map

Distance vs. PFAS Concentration

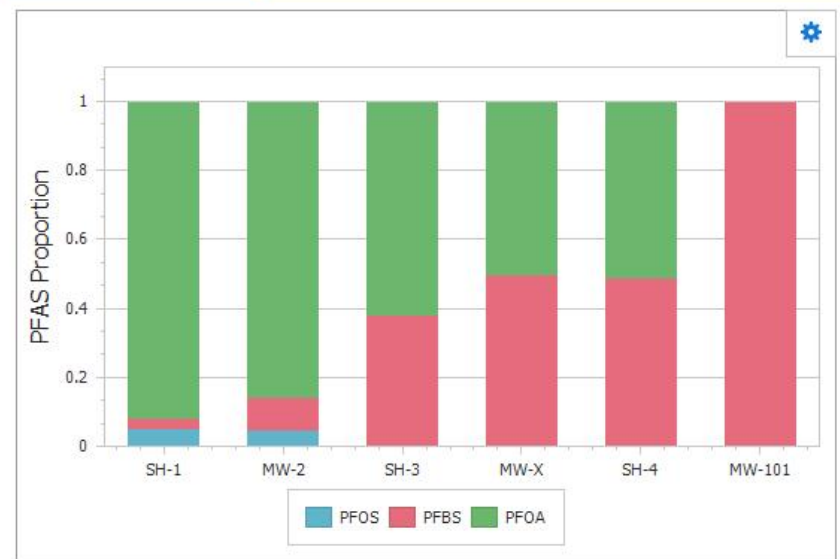
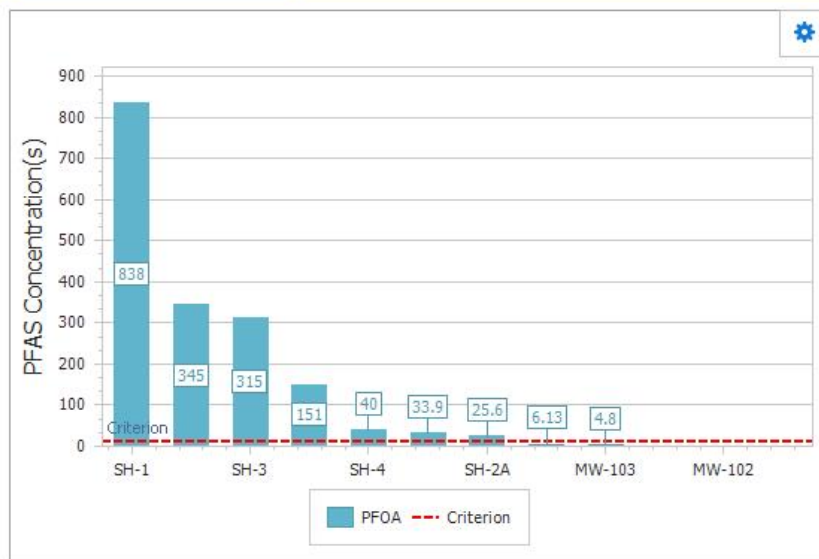
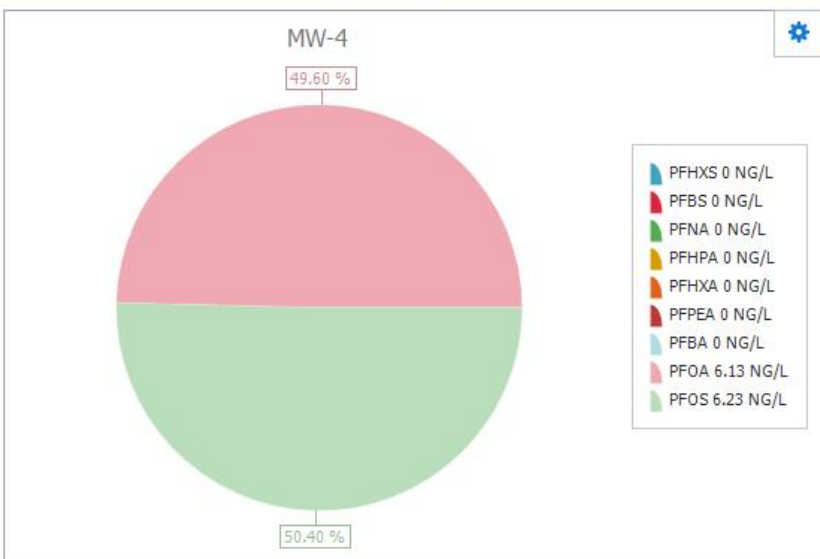
Source Well: SH-1



Radar Diagram Normalized Radar Chart Pie Chart

PFAS with Concentration Distribution

PFAS Relative Percent Bar Chart



This example demonstrates:

- ▶ Distinct PFAS migration pathway from a source in groundwater
- ▶ PFAS signature characteristic of end-of-PFAS-lifecycle waste facility
- ▶ Morphing PFAS signature from common source along groundwater flow path
- ▶ Monitoring well (MW-4) with disparate PFAS signature
- ▶ 58% of samples exceed PFOA criterion of 12 ng/L
- ▶ PFOA criterion (12 ng/L) attained at ~1,500 feet from source

Thank you!!



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Practice Leader

Emerging Contaminants

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