

# BAM – PFAS Phyto remediation

Former Tannery – Northeast Michigan

## Pilot Treatment

**Project Summary:** ORIN participated in a project testing the capability of phytoremediation for PFAS impacted groundwater using a combination of tested remedial strategies. BAM was mixed at 8% by volume of soil to 8' wide trenches that extended down in to the saturated zone. Specific tree species were planted overtop of the trenched areas. A specialized sleeve isolated the rhizosphere from the surrounding vadose soils and rainwater seepage, creating a controlled bioreactor that uptakes groundwater. BAM and Microbes were also added to this bioreactor design. A control tree (BKG-1) isolated the rhizosphere via the same method, but it did not receive BAM and Microbe treatment. The groundwater and tree leaf tissues were periodically analyzed.

## Site Conditions:

### Contaminants –

#### Perfluorinated Compounds

Groundwater:

2,200 to 6,500 ng/L

Background Leaf Tissue:

>80 ng/g

#### Impacted Matrix –

Silty Sands

4 to 12 ft-bgs

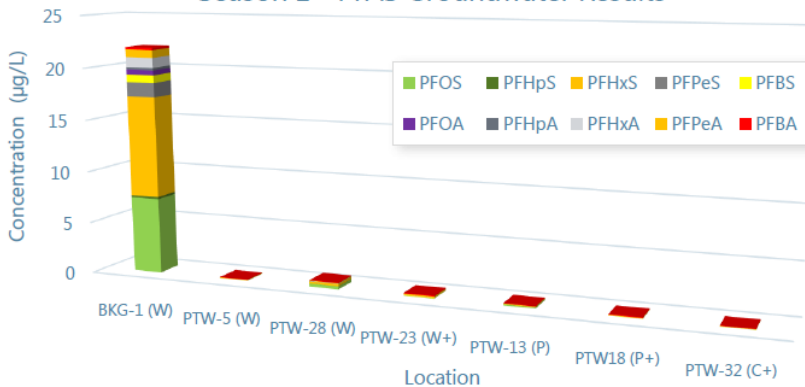
#### Treatment Technology –

BAM

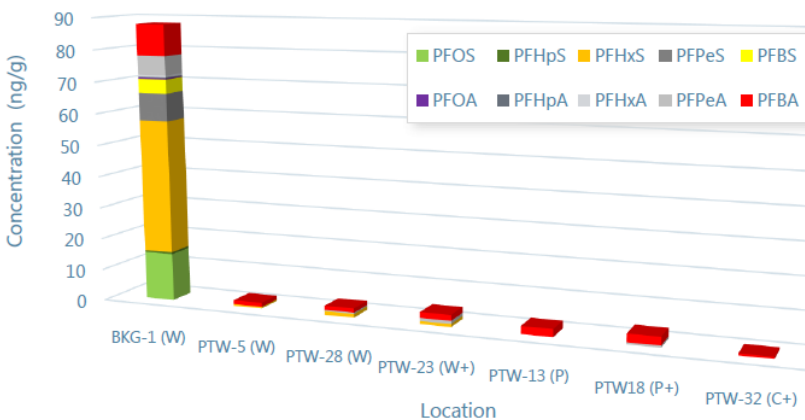
Microbes

Phytoremediation

Season 1 - PFAS Groundwater Results



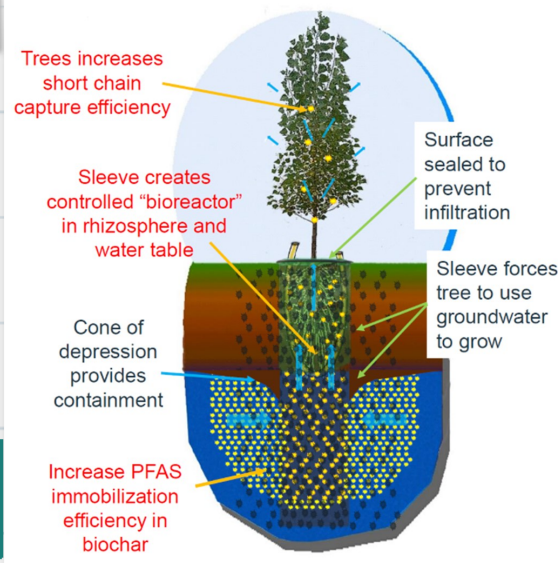
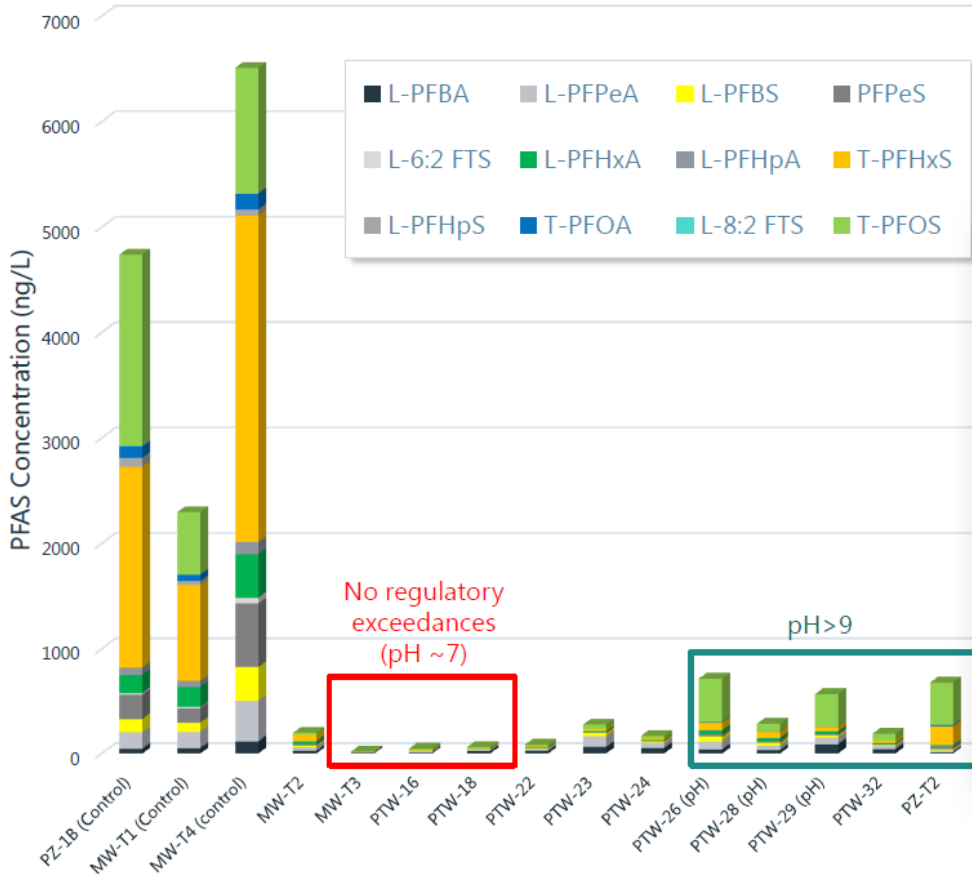
Season 1 - PFAS Leaf Tissue Results



# BAM – PFAS Phyto remediation

Former Tannery Fire – Northeast Michigan

Groundwater PFAS Results in Treewell Area



**Project Results:** Plants bioaccumulate PFAS as shown by the control tree BKG-1. Phytoremediation offers a solution to compliment BAM and microbial treatment strategies through bio attenuation within the rhizosphere. This project uses BAM to immobilize PFAS and reduce flux to the rhizosphere, while the trees capture the more mobile shorter chain compounds (C<4). Longer and shorter chain compounds become bioavailable with capture for PFAS microbial degradation. Leaf tissue samples taken from the test trees show a predominant increase in PFBA after 1 season. In addition, groundwater samples achieved regulatory concentration reductions after 1 month in areas of the site with pH 6.5-7.