



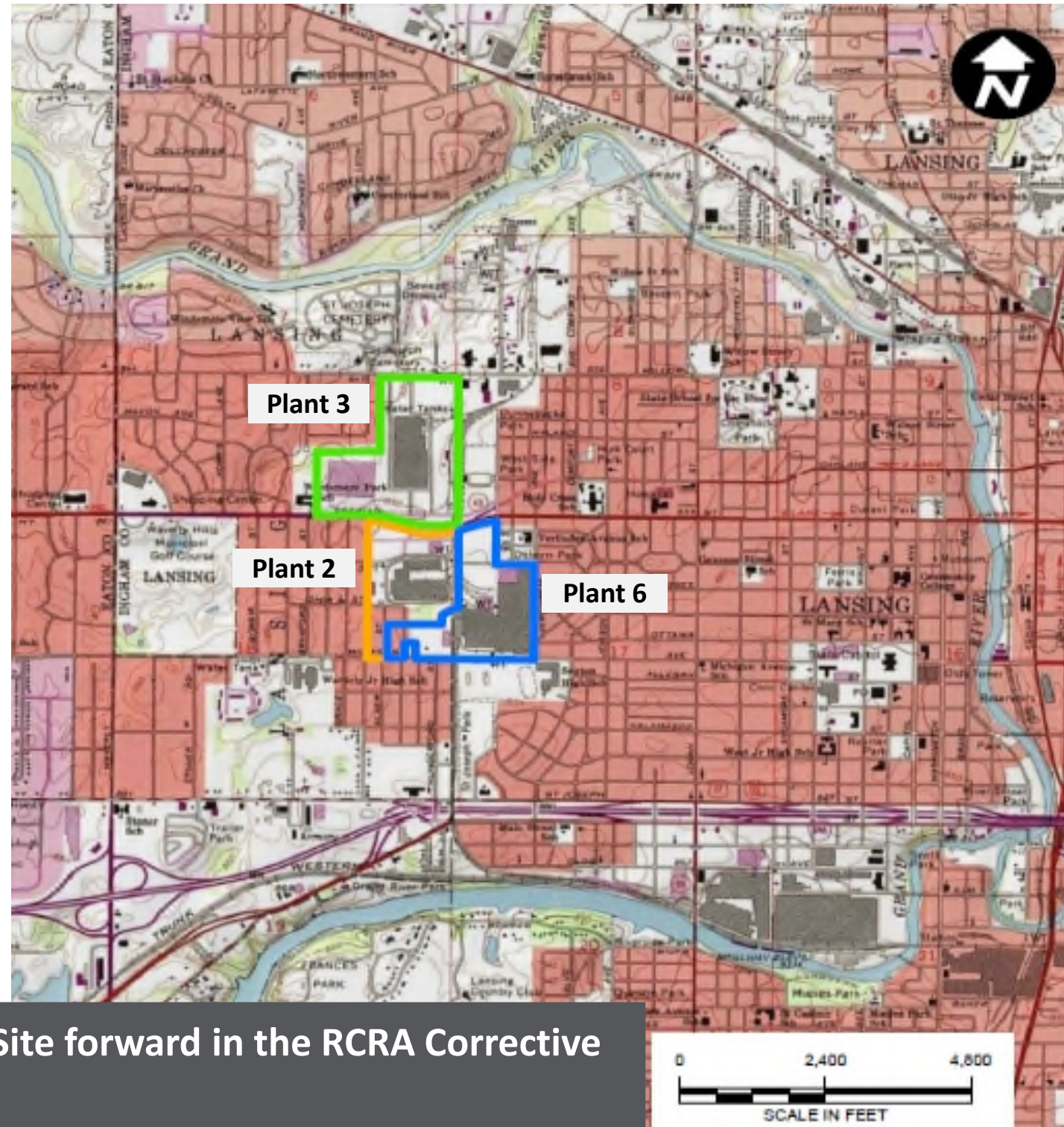
RACER TRUST LANSING PLANTS 2, 3, & 6

2022 Third Quarter Progress Report | October 15, 2022

More detailed reports are available on RACER's Webpage for this Site:
<https://www.racertrust.org/properties/lansing-plant-2-industrial-land>

Site Introduction

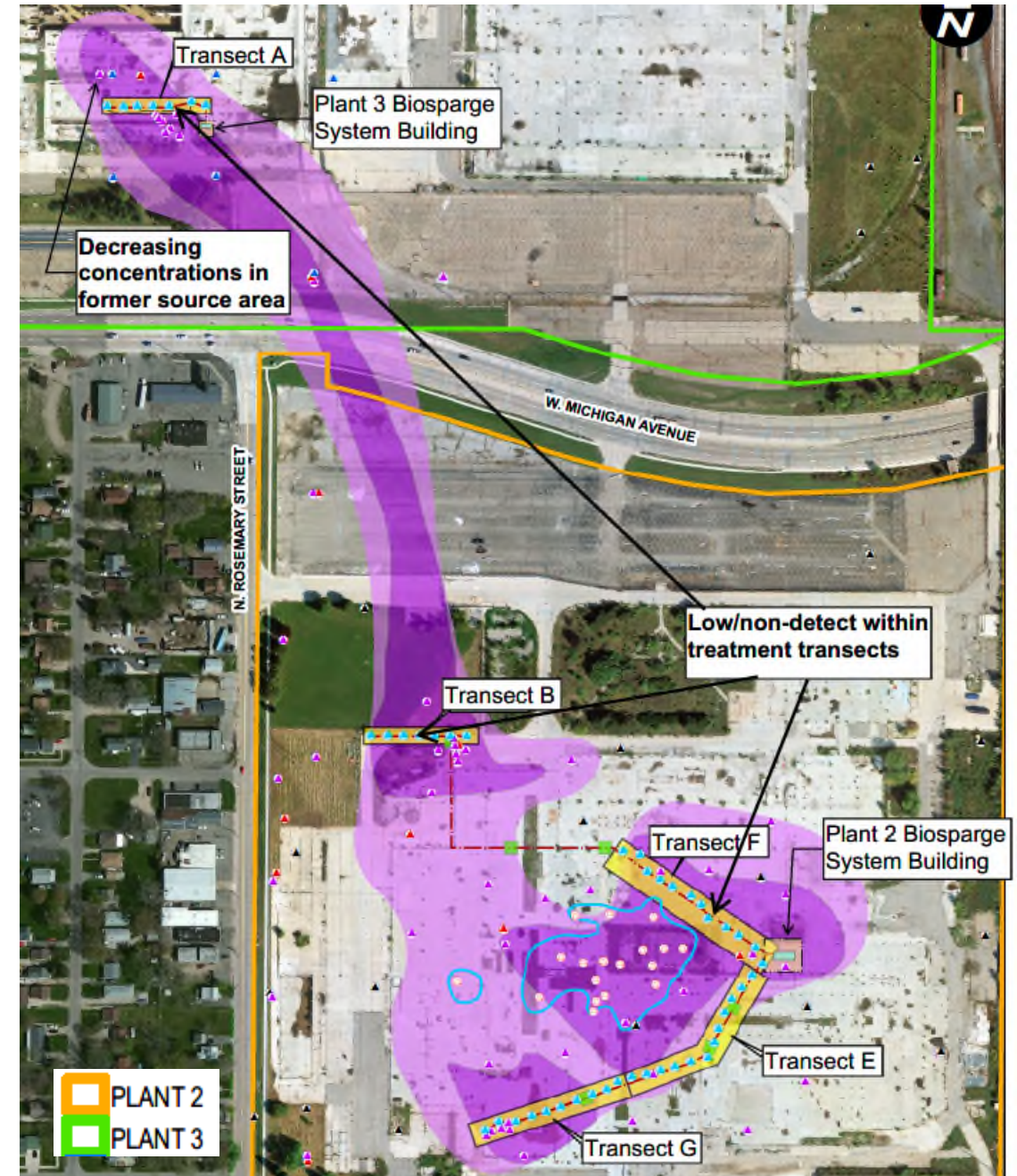
- Remediation at the RACER Lansing Site is being performed through the Resource Conservation and Recovery Act (RCRA) Corrective Action program under the oversight of the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Current activities include focused site characterization, interim remedial actions, and evaluation of remedial alternatives.
- There is currently no known exposure pathways for area residents associated with the site contaminants.
- Characterization of the 1,4-dioxane plume in weathered bedrock at a depth of approximately 60 to 75 feet below the ground surface is complete. Remediation of 1,4-dioxane in the weathered bedrock includes operation of the Plant 2 and Plant 3 biosparge systems (Plant 2 system started operations during the third quarter of 2020). It is anticipated that portions of the Plant 2 biosparge system may need to operate for 10 to 15 years. See the appendix at the end of this report for more information on biosparging.
- Characterization of per and polyfluoroalkyl substances (PFAS) in groundwater is ongoing to the east of Plant 6. Interim actions for PFAS include storm sewer modifications on Plants 2, 3, and 6 to eliminate groundwater containing PFAS from infiltrating into and then discharging off-site through the storm sewers.
- Monitoring of potential soil vapor intrusion (VI) to indoor air is ongoing and will continue in the northeast portion of Plant 6 and the adjacent off-site area.
- Routine groundwater monitoring on Plants 2, 3, & 6 in the shallow (perched) zone, weathered bedrock, shallow bedrock, and deep bedrock is ongoing and is anticipated to continue for 25 to 30 years.



Activities completed during this period move the Site forward in the RCRA Corrective Action process

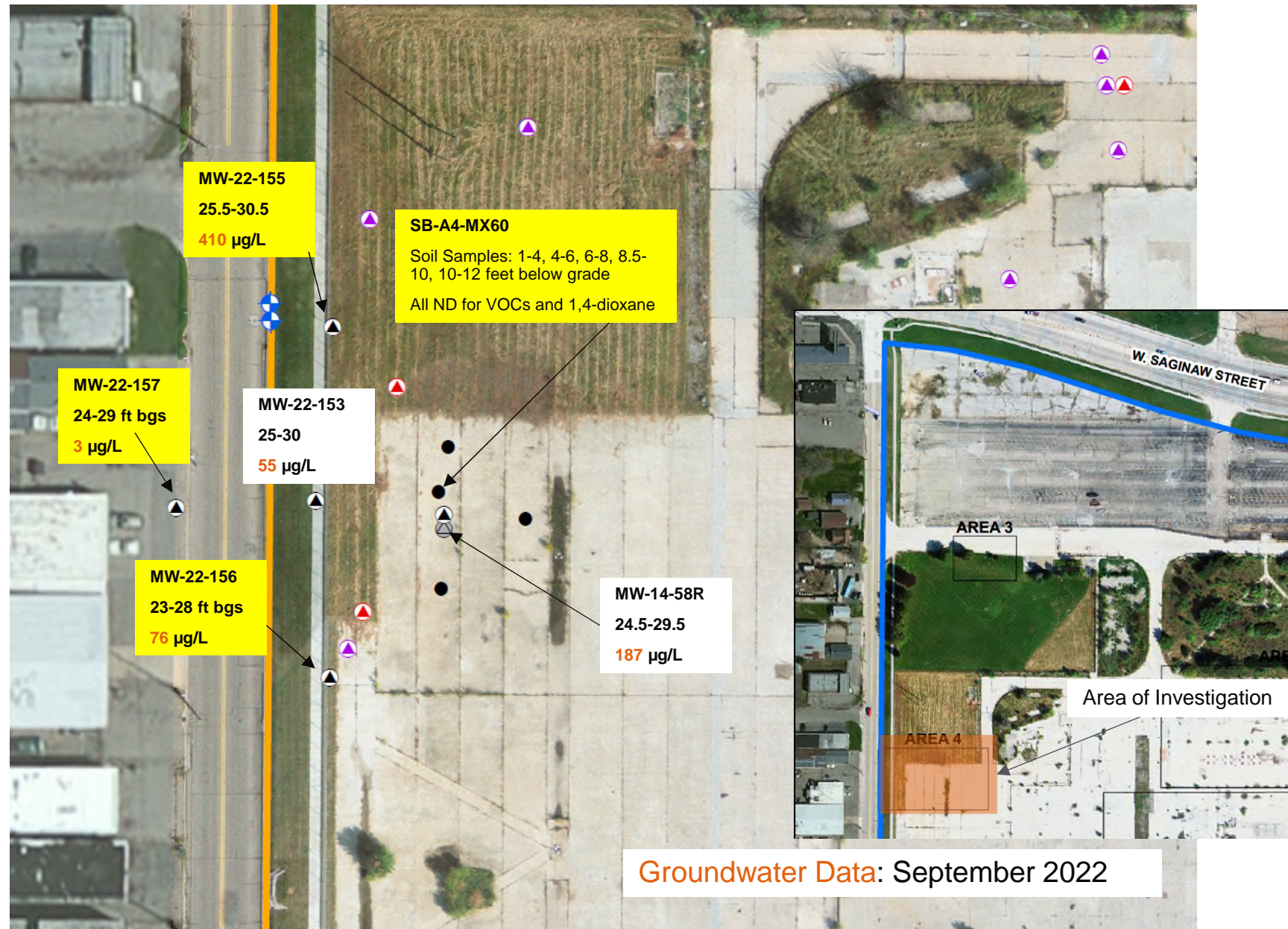
Remediation of 1,4-Dioxane in Weathered Bedrock

- Biosparge systems at Plant 2 and Plant 3 are fully operational
 - Minimal downtime related to equipment upgrades/replacement or regular system maintenance
 - Electrical outages were experienced but were remedied quickly due to remote monitoring and regular system checks
- Results from the Second (full round) Quarter 2022 performance monitoring were provided in the Second Quarter progress report.
- Results of performance monitoring show that the biosparge systems are achieving the short-term objective of reducing 1,4-dioxane concentrations and mass along the core of the weathered bedrock plume
- A full round of performance monitoring will be conducted in Fourth Quarter 2022 to continue with the semi-annual sampling schedule
- Results of performance monitoring conducted in 2022 will be summarized in the Annual Lower 1,4-Dioxane Biosparge Progress Report to be submitted in approximately April 2023



Investigation of 1,4-Dioxane in Perched Zone Plant 2

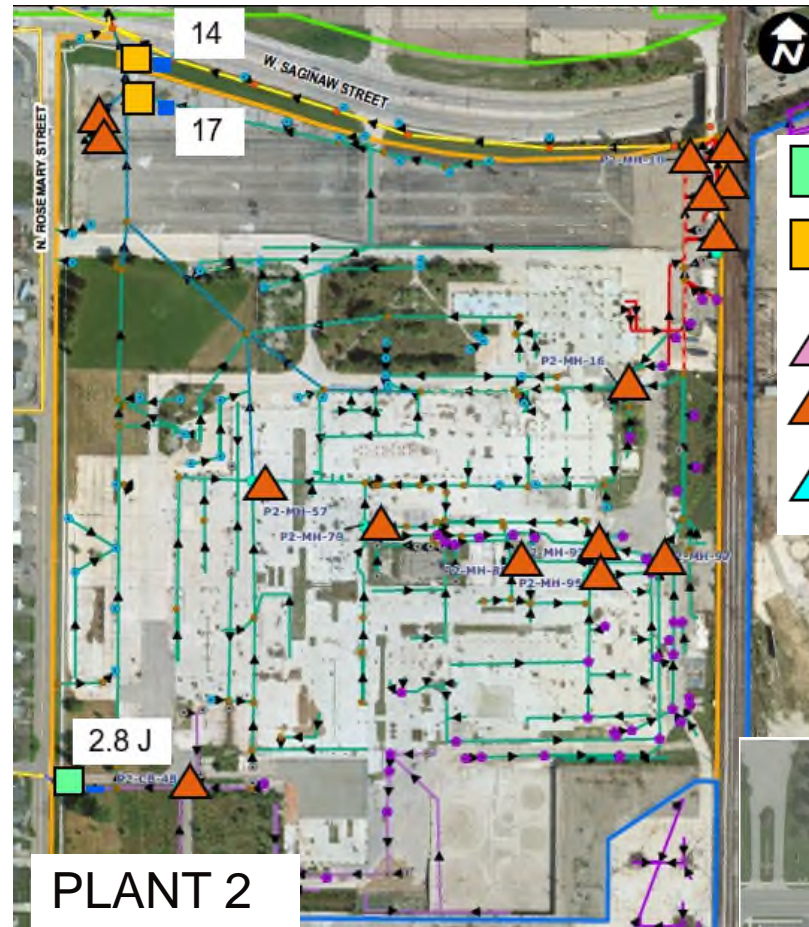
- Completed one soil boring adjacent to MW-14-58R (SB-A4-MX60):
 - Collected 5 Soil samples
 - All non-detect for 1,4-dioxane and VOCs
- Installation of three perched monitoring wells
 - Elevated concentrations north and south
 - Concentrations decreased at MW-14-58R
 - Below Drinking Water Criteria west of Rosemary
- Next steps: survey wells, evaluate horizontal gradient, and resample



Remediation of PFAS Impacts

Sewer Modifications and Performance Sampling

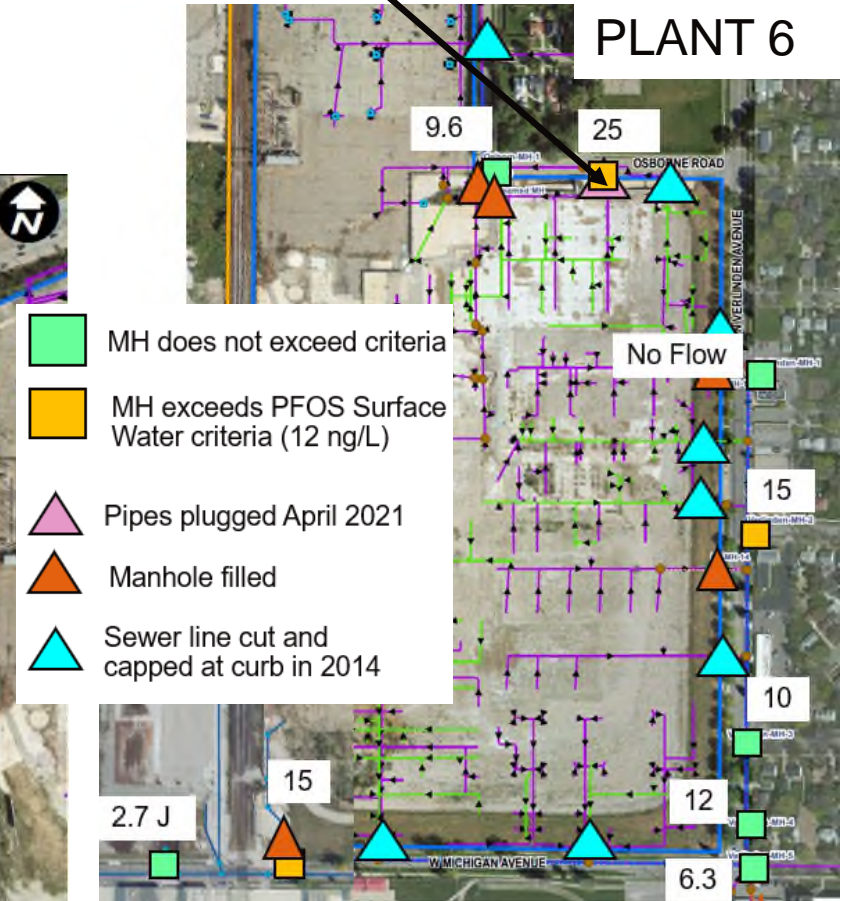
- Third Quarter site wide performance monitoring of storm sewers was conducted in August 2022. Results for Perfluorooctanesulfonic acid (PFOS), the specific PFAS of concern, are depicted on figures to the right.
- Fourth Quarter site wide performance monitoring of storm sewers is planned to be completed in November 2022. Results will be summarized in the Fourth Quarter Progress Report.



Catch basin structure replaced in Nov 2021



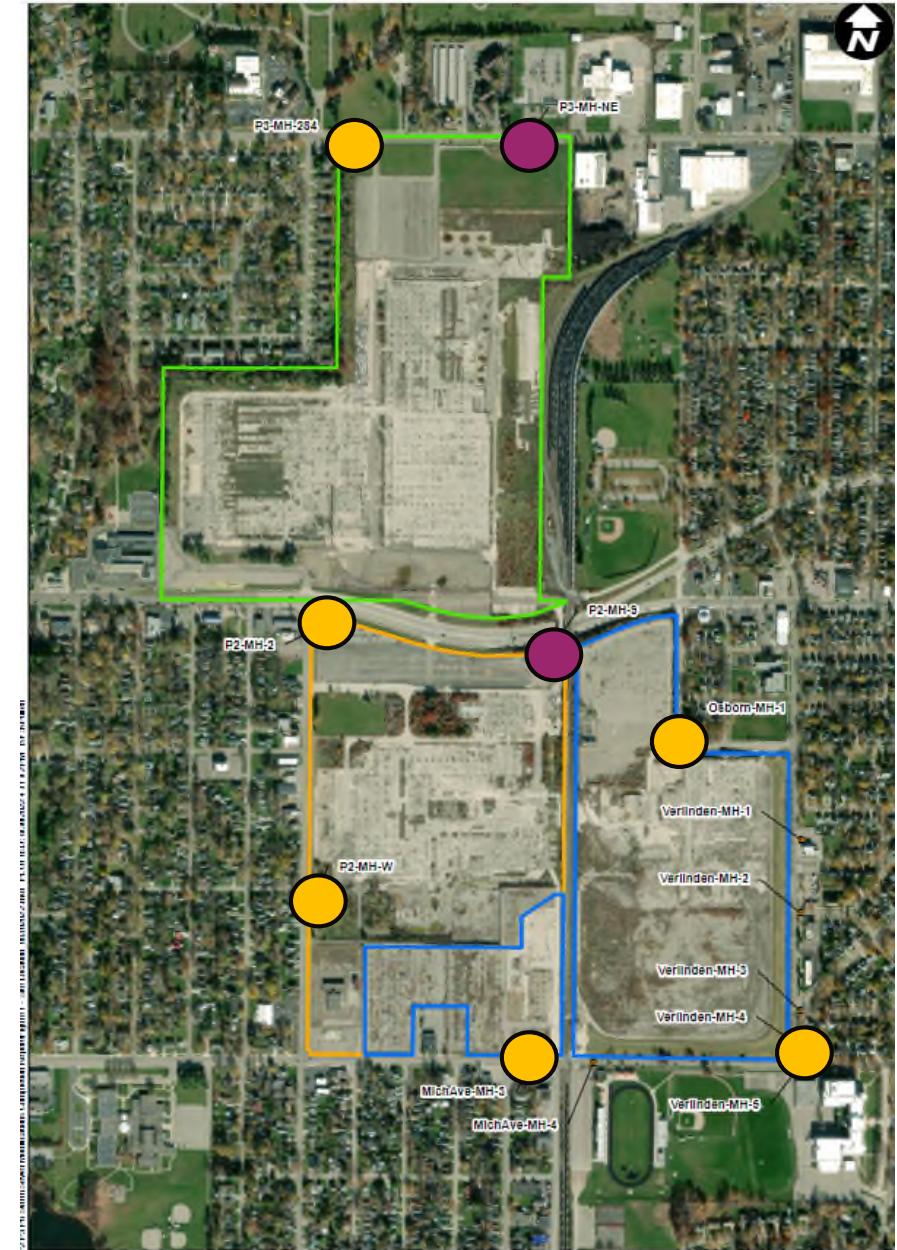
PLANT 6



Remediation of PFAS Impacts

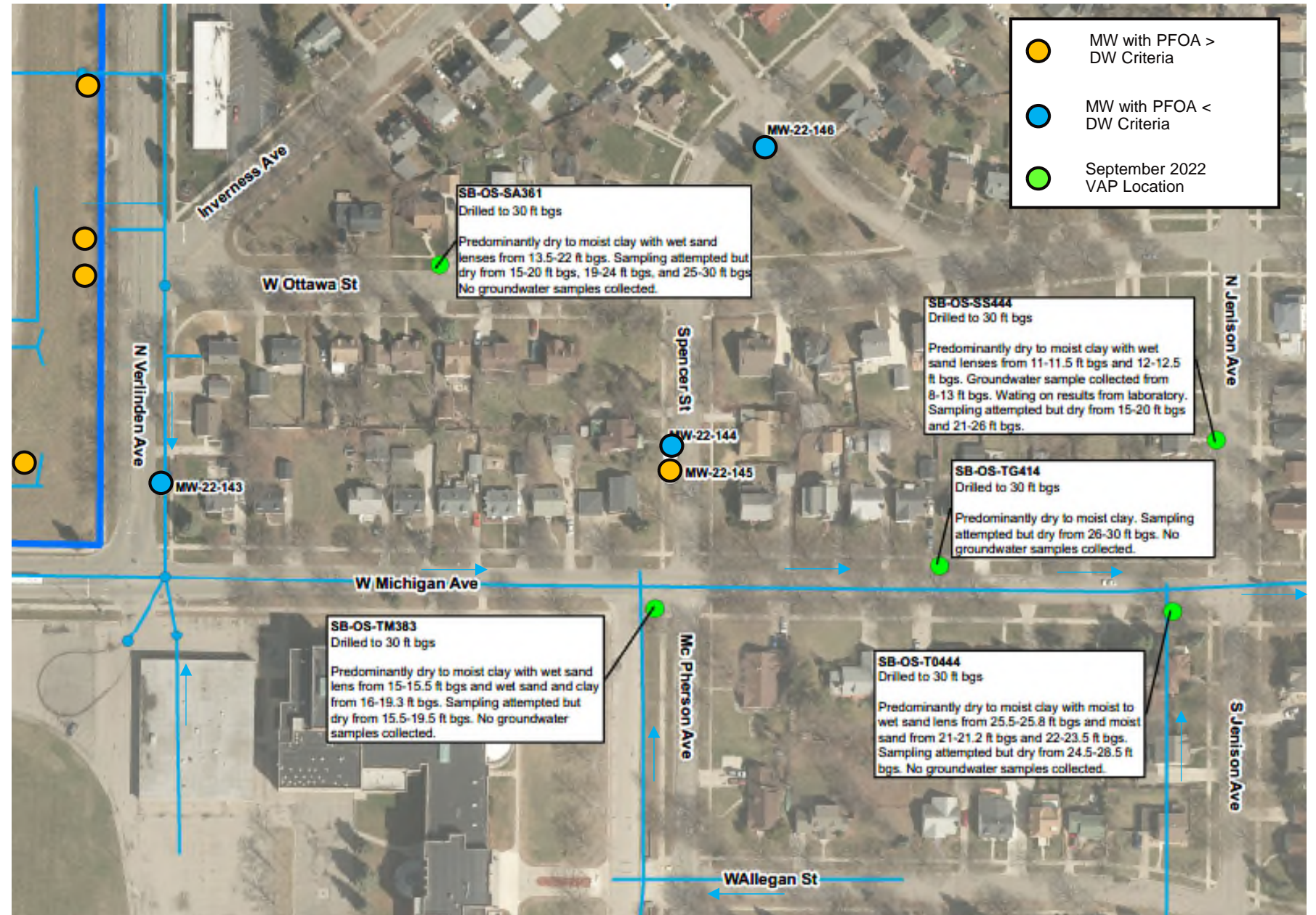
- Quarterly monitoring of select sewer outfalls will be included in the Interim Groundwater Monitoring Program beginning in 2023
- Proposed inspection locations are typically dry based on modifications
- Sampling results will be reported in the semi-annual and annual Groundwater Monitoring Reports
- Based on results, proposed modifications (if necessary) will be discussed with EGLE

 Sample
  Inspect



Investigation of PFAS at Plant 6 and Off-Site

- Completed 5 vertical aquifer profile (VAP) borings to 30 feet (green locations). All but one did not contain enough water to collect a sample.
- Permanent monitoring wells will be installed at select locations during Fourth Quarter 2022



Plant 6 VI Evaluation

Installed new monitoring well MW-20-154 at 6-11' bgs

- Groundwater exceeds Site Specific Volatilization to Indoor Air Criteria (SSVIAC) for residence with a basement (0.96 µg/L)
- New monitoring well will be sampled for four quarters and evaluation of the need for any additional investigation to be completed

Legend

VAP Groundwater (GW) Analytical Results

- VC < SSVIAC criterion
- VC > SSVIAC criterion

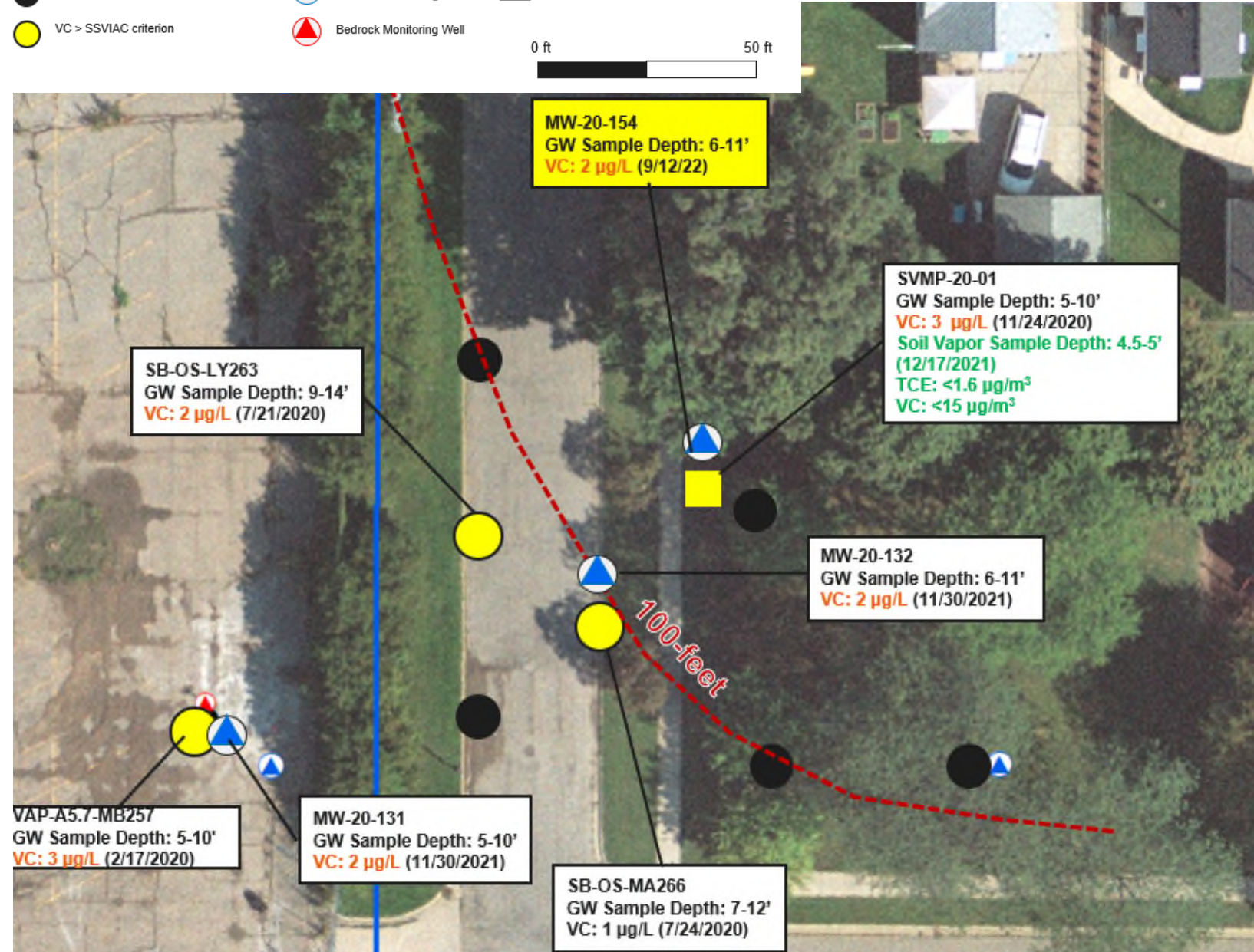
Monitoring Wells (MW)

- ▲ Perched Monitoring Well
- ▲ Bedrock Monitoring Well

Soil Vapor Monitoring Point (SVMP)

- VC > SSVIAC in GW, VC < SSVIAC in soil vapor

0 ft 50 ft



Work in Progress and Near-Term Milestones Anticipated During the Fourth Quarter of 2022



Activity	Schedule
Remediation of 1,4-Dioxane in the Weathered Bedrock	
Plants 2 and 3 Biosparge System Operation	Ongoing
Semi-Annual Biosparge Performance Sampling	November 2022
Investigation of 1,4-Dioxane in Perched Zone	
Plant 2 1,4 Dioxane MW-14-58R Evaluation Summary Memo	November 2022
Remediation and Investigation of PFAS	
Plant 6 Off-Site Well Installation, Sampling and Summary Memo	November/December 2022
Quarterly Storm Sewer Sampling	November 2022
Other investigations and Sampling	
Plant 6 VI Evaluation Additional Sampling	November 2022
P2 and P3 Soil Corrective Measures Work Plan and Toxic Substance Control Act (TSCA) Plan Report Updates	December 2022
Updates to Interim Groundwater Monitoring Plan (IGMP)	November 2022
Fourth Quarter 2022 Groundwater Monitoring	November 2022

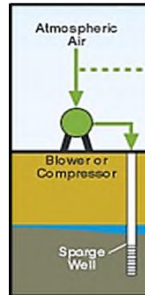
Appendix

BIOSPARGING TREATMENT OF 1,4-DIOXANE

Lansing Industrial Land, Lansing and Lansing Township, Michigan

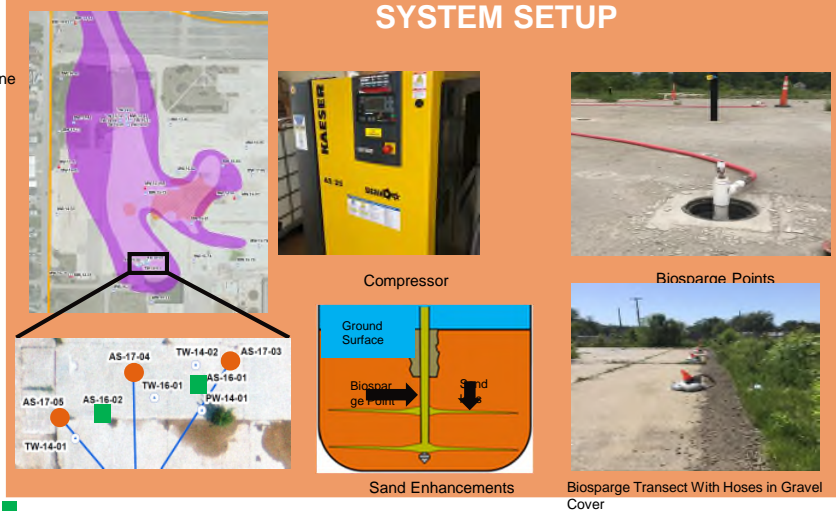
WHAT IS BIOSPARGING?

- Air and small amounts of propane are injected into the ground through wells
- Promotes biodegradation of chemicals in groundwater, much faster than it would occur naturally
- 1,4-dioxane is treated in the ground, so minimal waste is generated
- Nearby wells are sampled to make sure treatment is occurring



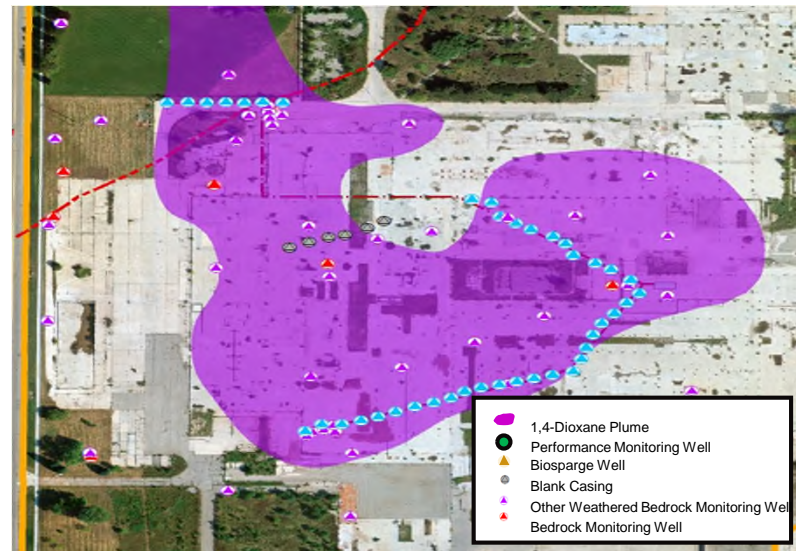
Propane

SYSTEM SETUP



- 2016 Pilot Test Biosparge Points
- 2018 Pre-Design Study Biosparge Points With Sand Enhancements
- Weathered Bedrock Monitoring Well

Plant 2 Biosparge Transect Layout



CONCLUSIONS

- Biosparging is a low cost, effective, safe and sustainable method for treating 1,4-dioxane
- Installation of sand enhancements improves treatment
- Continual monitoring of the treatment system improves results
- Technology can be scaled up to treat the rest of the site

FULL-SCALE DESIGN

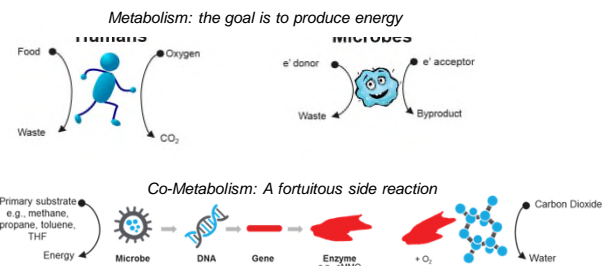
- 5 transects with 48 air sparge wells across Plants 2 and 4
- Nearly 5 miles of air hose and an air/propane injection network
- Groundwater flows from northwest to southeast and is cleaned by each transect
- Tubing installed above grade to save on costs and to accommodate future development
- Network of monitoring wells to track treatment progress



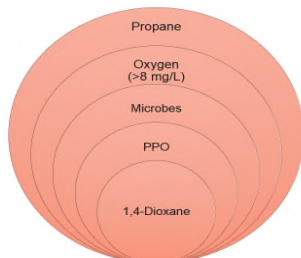
TREATMENT OBJECTIVES

- Reduce onsite concentrations of 1,4-dioxane in the top/weathered zone of the bedrock aquifer
- Prevent off-site migration of 1,4-dioxane

CO-METABOLIC BIODEGRADATION OF 1,4-DIOXANE:



Propane + Oxygen + Microbes = 1,4-Dioxane Treatment



Plant 2 Biosparge Unit and Nutrient Injection Tanks