RACER TRUST
LANSING PLANTS 2, 3, & 6

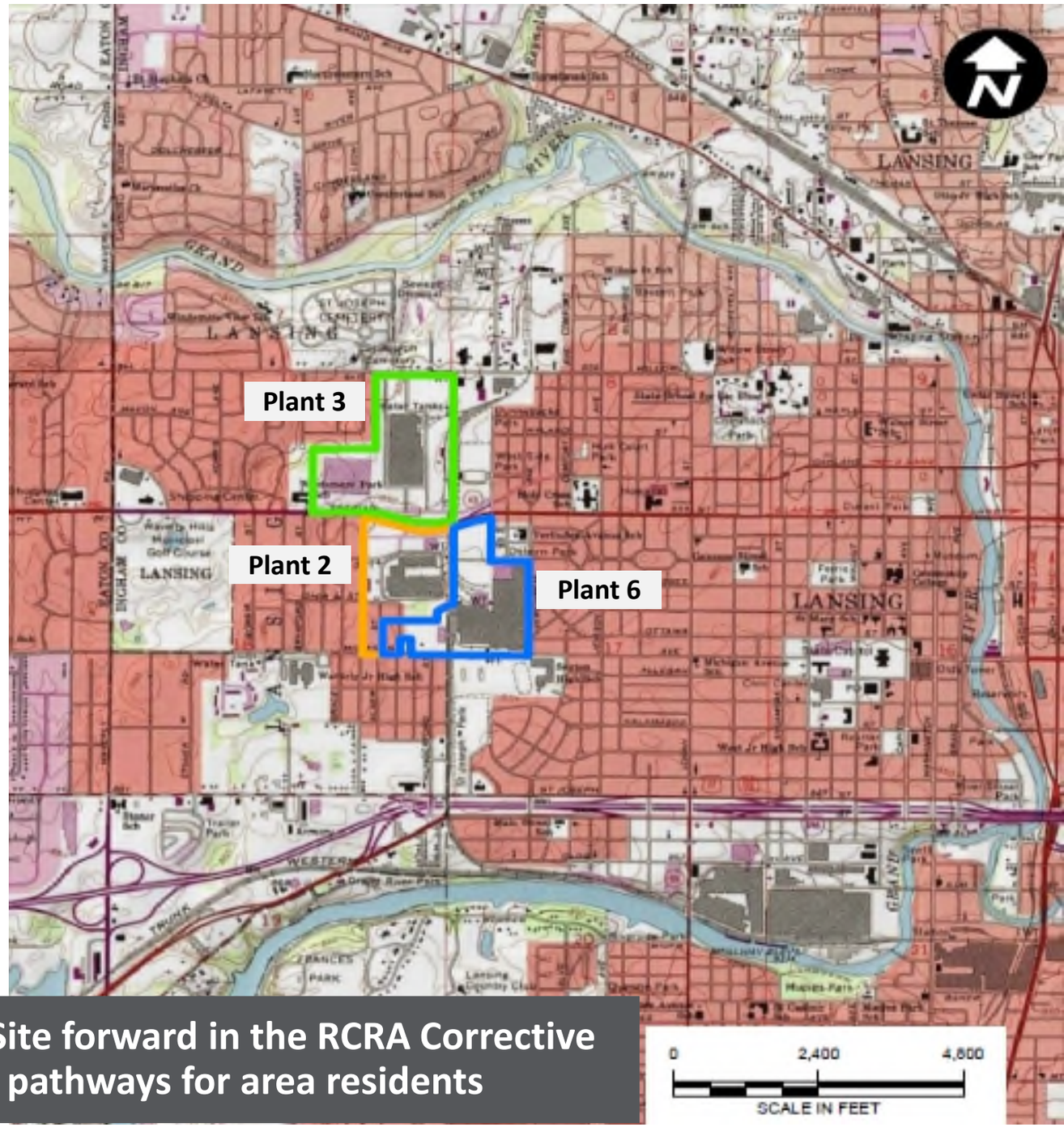
2025 First Quarter Progress Report | April 18, 2025

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

Table of Contents

Site Introduction

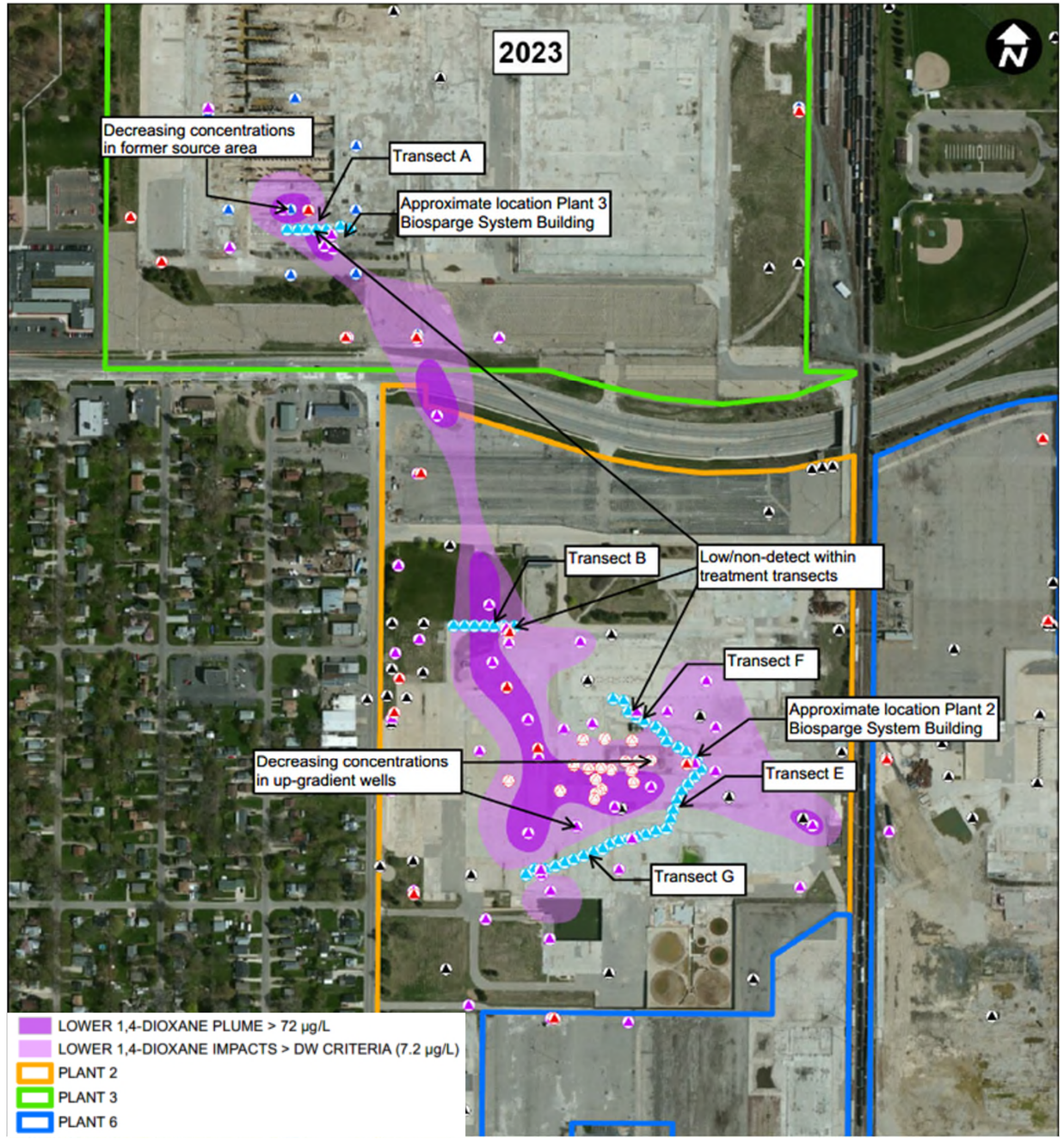
- Remediation at the RACER Lansing Site is being performed through the Resource Conservation and Recovery Act (RCRA) Corrective Action program under the oversight of the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Current activities include focused site characterization and interim remedial actions.
- There is currently no known complete 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 (The Plant 3 system began operating in 2019 and the Plant 2 system began operating in 2020). The biosparge system has successfully reduced concentrations of 1,4-dioxane in the weathered bedrock. Short-term system objectives continue to be met.
- Routine groundwater monitoring on and in certain areas adjacent to Plants 2, 3, & 6 in the shallow (perched) zone, weathered bedrock, shallow bedrock, and deep bedrock is ongoing and is anticipated to continue for several years.



Activities completed during this period move the Site forward in the RCRA Corrective Action process and verified no complete exposure pathways for area residents

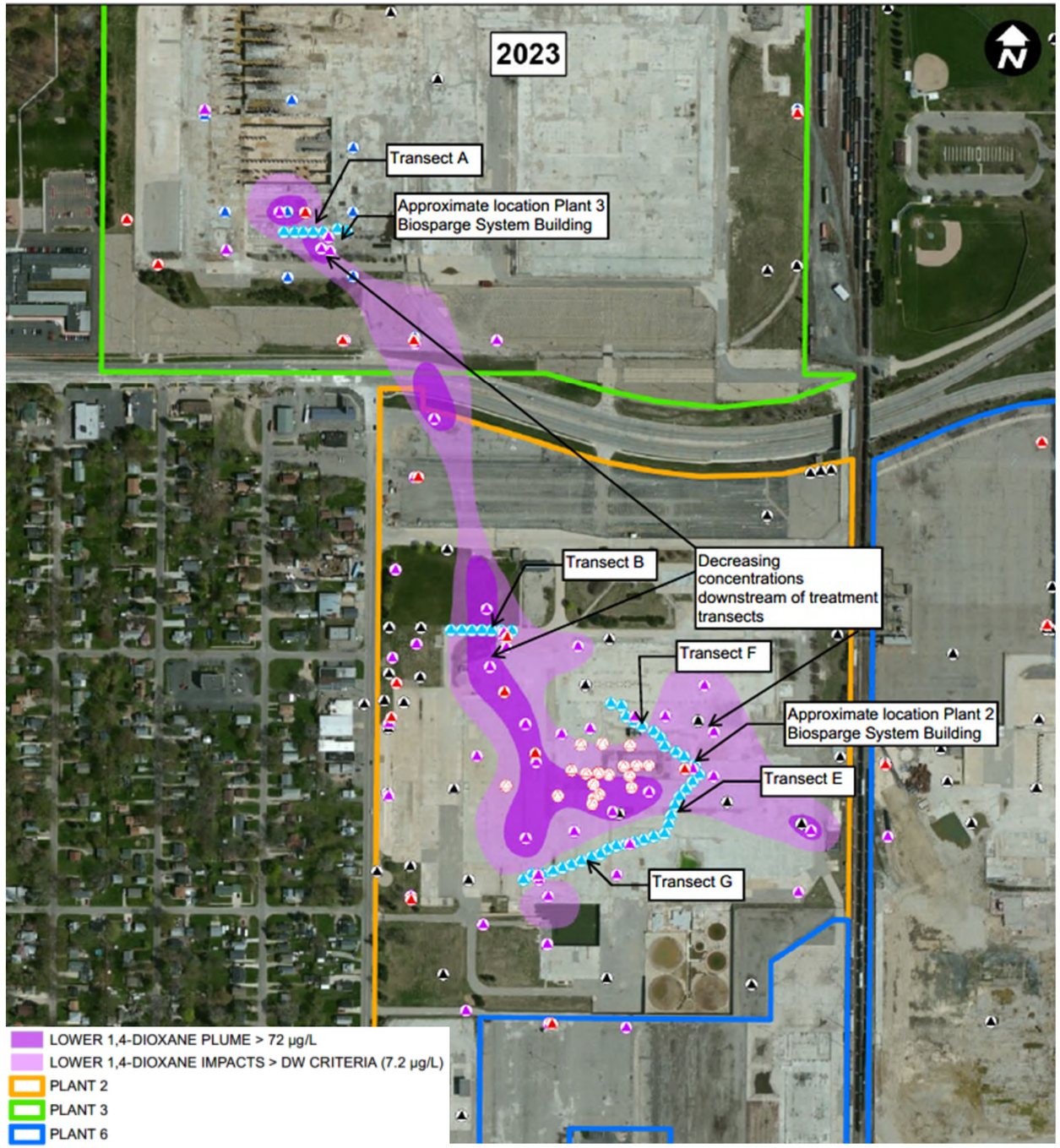
Remediation of 1,4-Dioxane in Weathered Bedrock

- Biosparge systems at Plant 2 and Plant 3 are fully operational
  - Some downtime in first quarter for compressor maintenance and nutrient injections (March 2025)
  - Wells AS-19-B06 and AS-19-B07 are currently turned off and have been for a couple of years
- 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



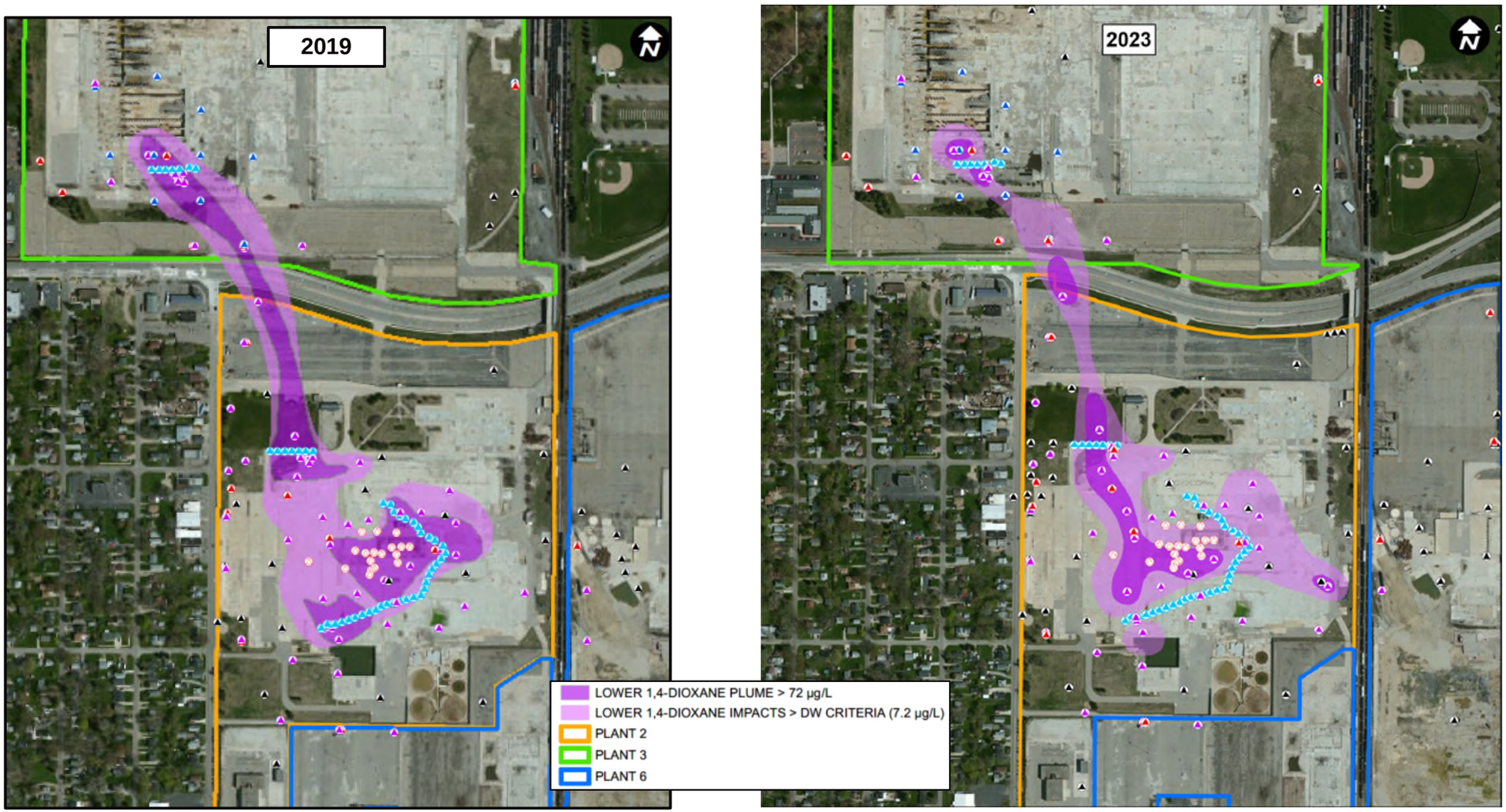
Remediation of 1,4-Dioxane in Weathered Bedrock

- First semi-annual sampling event will be completed in Second Quarter (May 2025).
- Results from the Second Quarter 2025 performance monitoring will be summarized in the Second Quarter update.
- An annual Biosparge Summary Report summarizing the 2024-year data is anticipated to be submitted to EGLE in April 2025.
- A test was proposed to temporarily shut down portions of the biosparge system to evaluate how the groundwater concentrations respond and to assess if modifications to the operation of the biosparge system are needed to reduce concentrations further. Awaiting EGLE response before implementation.



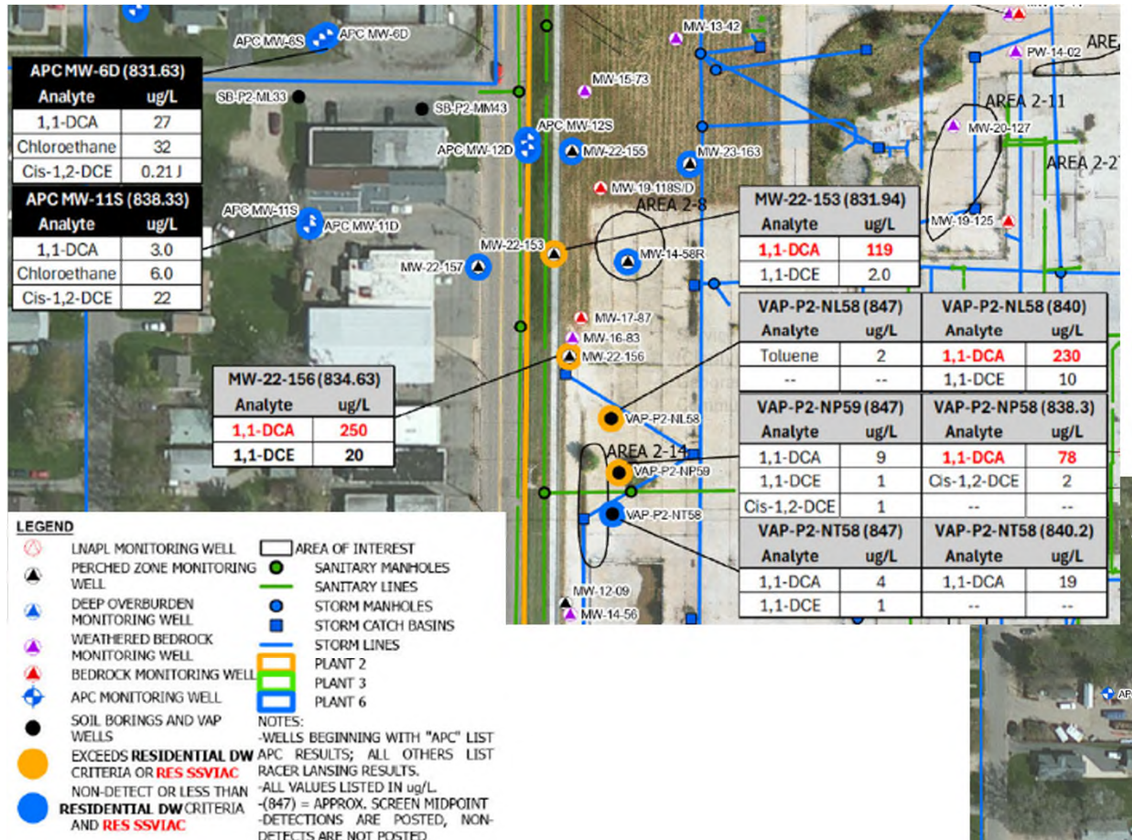
Remediation of 1,4-Dioxane in Weathered Bedrock

Visual depiction of lower 1,4-dioxane plume (located within the deep overburden and weathered bedrock) distribution in 2019 vs. 2023



Western Plant 2 Summary

- In March and April 2024, RACER Trust collaborated with USEPA and EGLE to collect additional groundwater data in the western portion of Plant 2 and to evaluate the concentrations detected in groundwater compared to vapor intrusion criteria.
- Data was received from USEPA in November 2024 and evaluated in the first quarter of 2025.
- The apparent perched groundwater flow direction in the MW-14-58R area is to the northwest.
- Volatile organic compounds that exceed the site-specific vapor intrusion criteria are defined by monitoring wells west of Rosemary Street, and to the north.



- Except for monitoring, no further evaluation of the potential for off-site vapor intrusion in this area is recommended
- Routine groundwater monitoring will be completed in accordance with the revised 2025 Interim Monitoring Plan.

Reports Submitted to EGLE First Quarter 2025

- Data Review and Summary Related to Potential Off-site Vapor intrusion from RACER Area 4/MW-14-58R submitted to EGLE on March 14, 2025
- 2024 Monitoring Well and SSMP Abandonment Memo submitted to EGLE on March 21, 2025.
- Revised Interim Monitoring Plan (IMP) re-submitted to EGLE on March 20, 2025, after addressing initial comments. Final to be submitted to EGLE second quarter 2025.
- Reports can be viewed or downloaded from the RACER Website for the Lansing Property: https://www.racertrust.org/properties/lansing-plant-2-industrial-land

Work in Progress and Near-Term Milestones Anticipated During the Second Quarter of 2025

Activity	Schedule
Remediation of 1,4-Dioxane in the Weathered Bedrock	
Plants 2 and 3 Biosparge System Operation	Ongoing
Biosparge Shut Down Test	Pending EGLE Concurrence
2024 Biosparge Summary Report Submittal	April 2025
Semi-Annual Biosparge Performance Monitoring	May 2025
Investigation of 1,4-Dioxane	
MS-14-58R Area Vapor Intrusion Assessment Report Submittal	March 2025
Investigation and Remediation of PFAS	
Semi-Annual Storm Sewer Sampling	May 2025
Other Investigations, Sampling and Reporting	
Annual Groundwater Monitoring Report for 2024	Second Quarter 2025
Semi-Annual Gauging Activities	May 2025

ARCADIS Design & Consultancy for natural and built assets

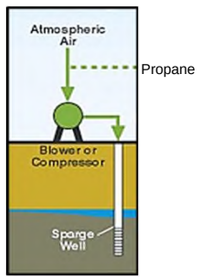
Appendix

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

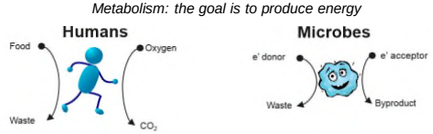


TREATMENT OBJECTIVES

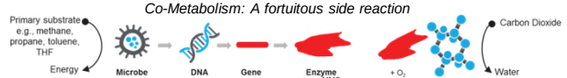
- Reduce onsite concentrations of 1,4-dioxane in the top/weathered zone of the bedrock aquifer
- Prevent off-site migration of 1,4-dioxane

CO-METABOLIC BIODEGRADATION OF 1,4-DIOXANE:

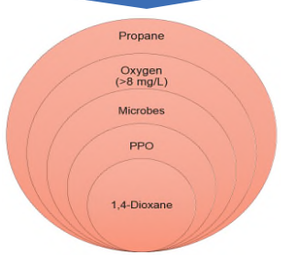
Metabolism: the goal is to produce energy



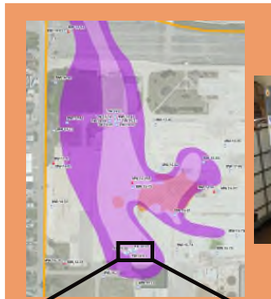
Co-Metabolism: A fortuitous side reaction



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

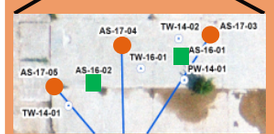


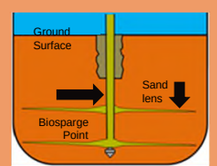
SYSTEM SETUP



Compressor


Biosparge Wellhead



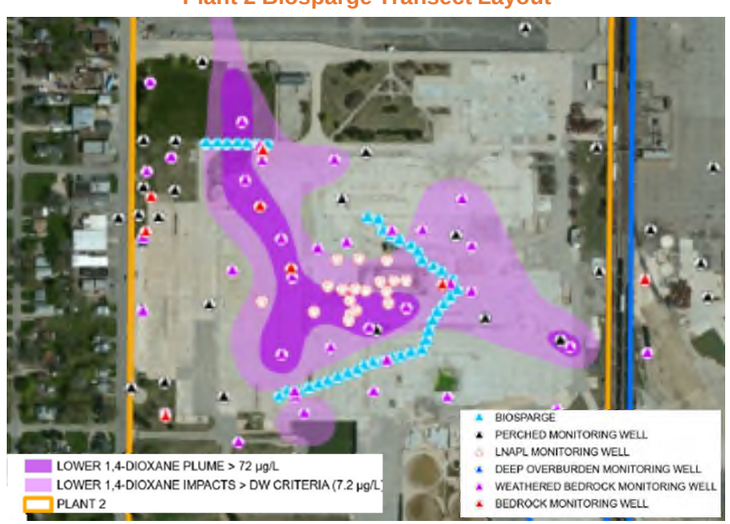


Sand Enhancements


Biosparge Transect With Hoses in Gravel Cover

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

Plant 2 Biosparge Transect Layout



RACER Lansing Biosparge System

- Testing showed that biosparging is a low cost, effective, safe, and sustainable method for treating 1,4-dioxane at the Site and that the installation of sand enhancements improves treatment
- Biosparge system includes 5 treatment transects with 48 sparge wells across Plants 2 and 3
- Biosparge equipment buildings are located on Plant 2 and 3 with nearly 5 miles of hose to convey air/propane from the buildings to the injection wells
- Treated groundwater flows from northwest to southeast as it is cleaned by each treatment transect
- Network of monitoring wells is to track treatment progress
- After 4 to 5 years of operation, the biosparge system has reduced average 1,4-dioxane plume concentrations from a range of 160 - 485 µg/L down to a range of 20 - 50 µg/L and has meet the treatment objectives

Plant 2 Biosparge Building, Propane Tank, Hoses, and Nutrient Injection Tanks