

Investigation of a CVOC Plume in Multiple Fractured Bedrock Horizons and Remediation using a Combined Remedies Approach

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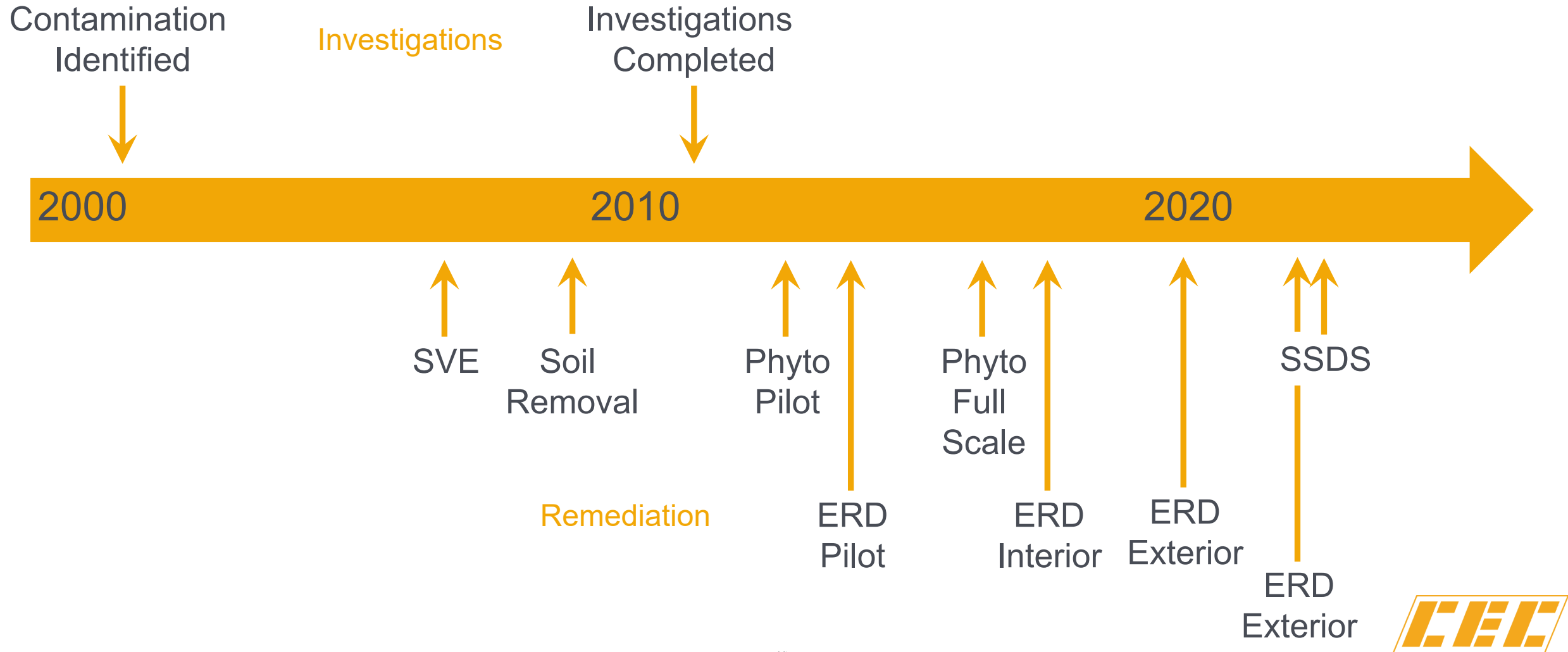
June 6, 2024

Background and Site Layout

- Western Pennsylvania
- CVOCs in soil and groundwater



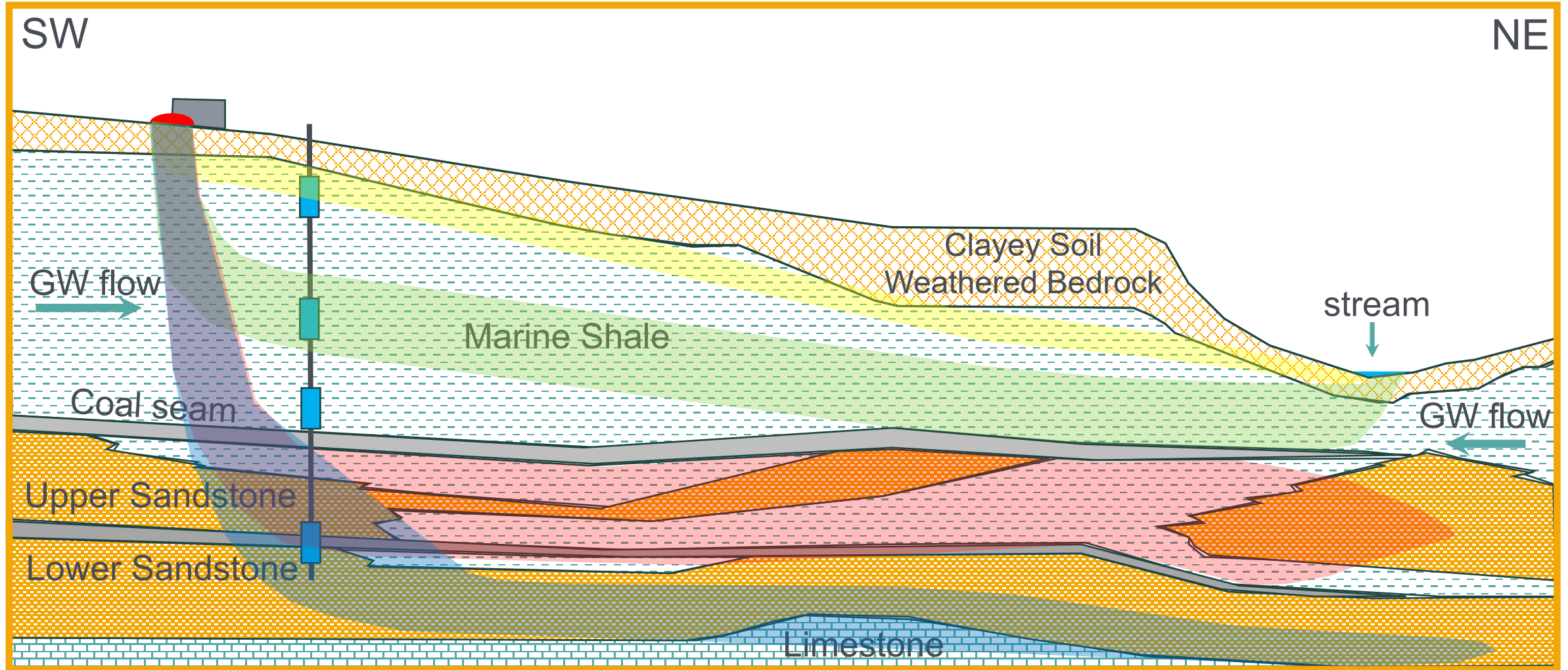
Timeline



Investigation and Remediation

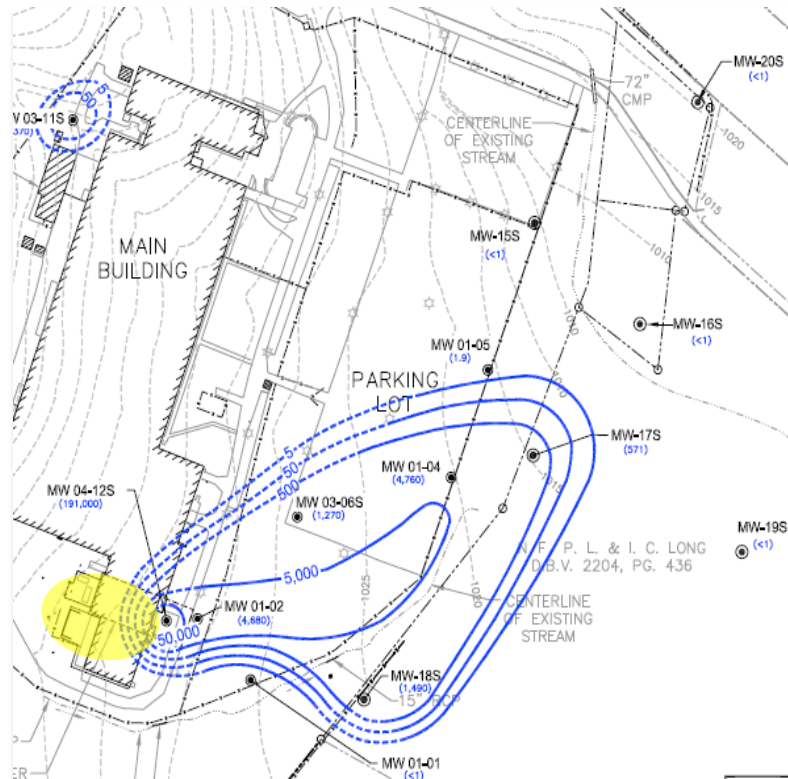


Geologic Cross Section

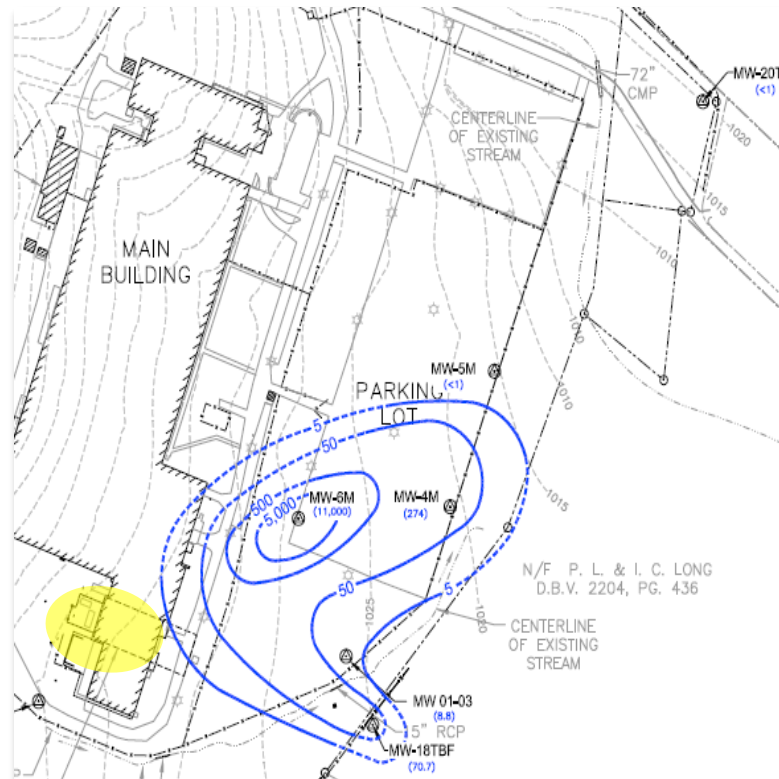


Pre-Remedial Baseline Plumes

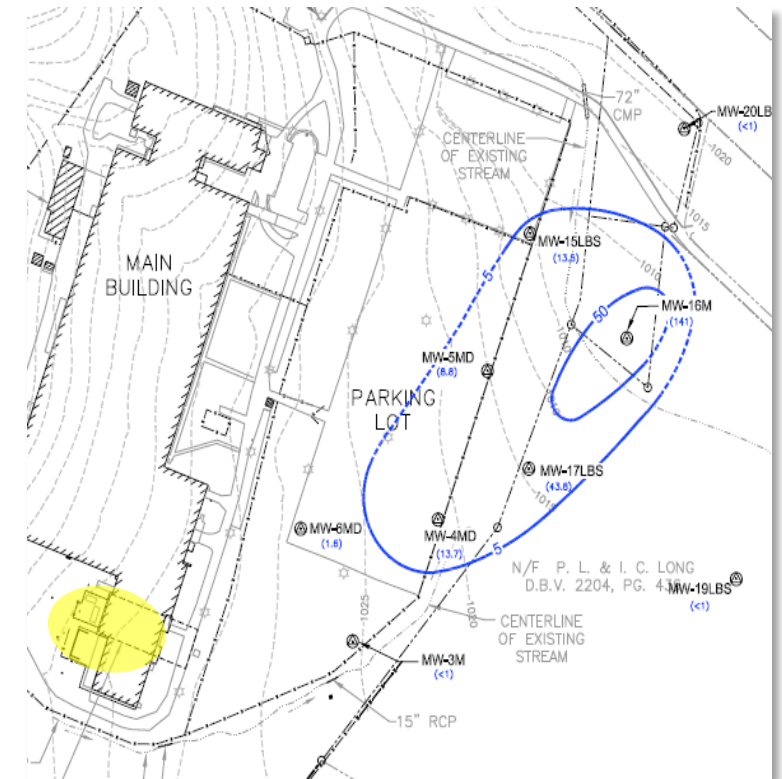
Marine Shale



Upper Sandstone

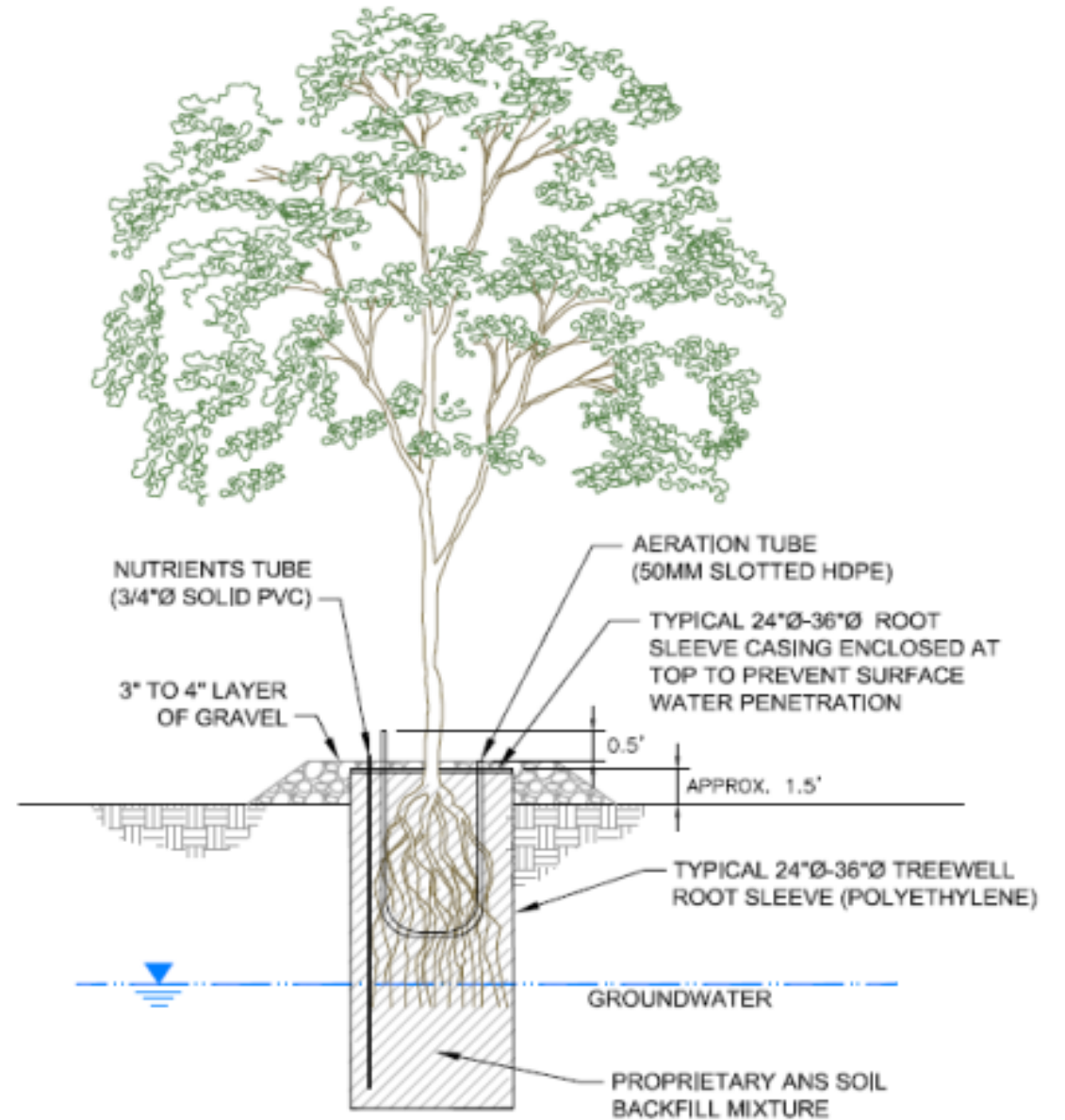


Lower Sandstone

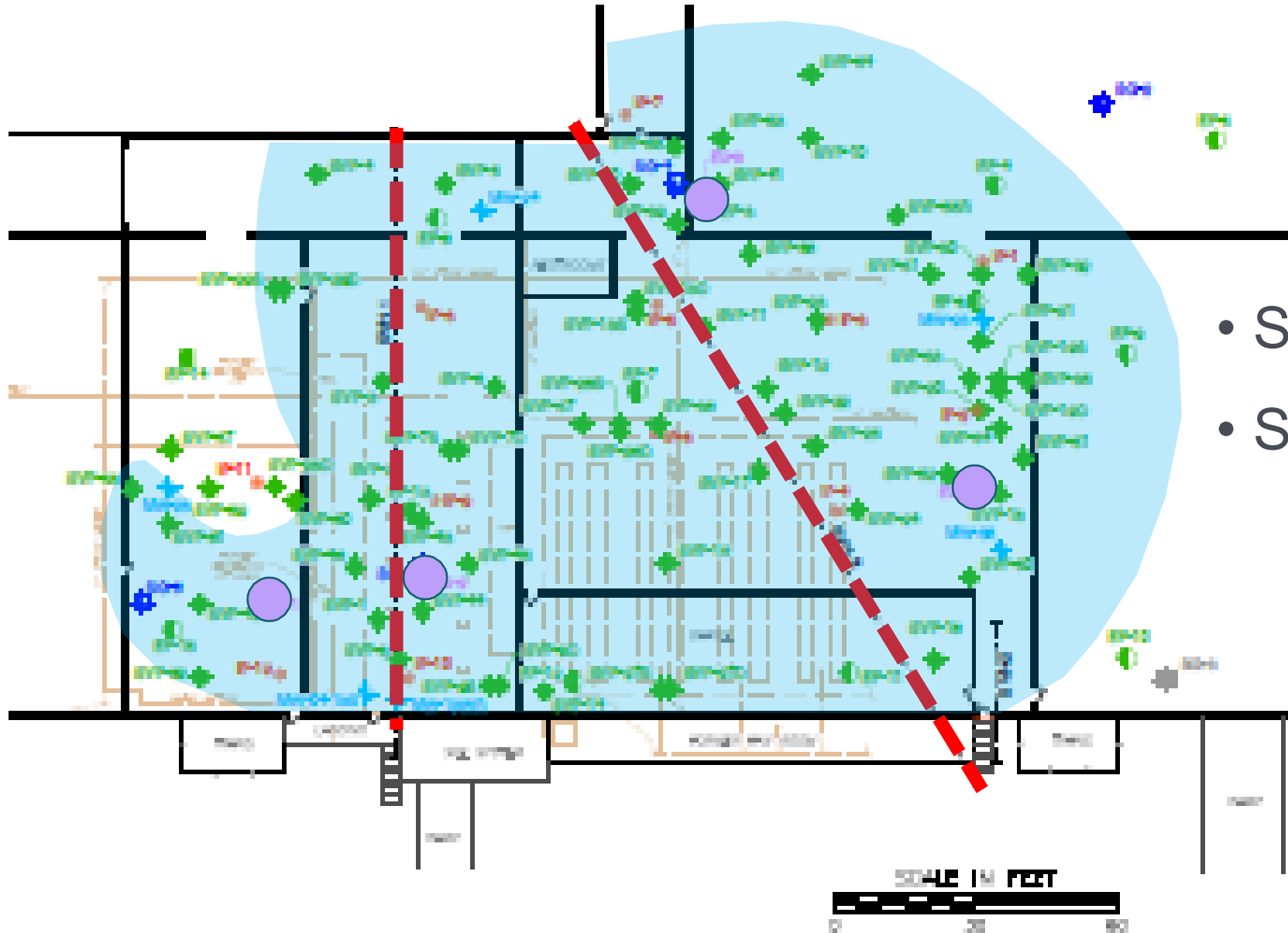


Remediation

- SVE/SSDS
- Soil Removal
- TreeWell® Technology
- ERD

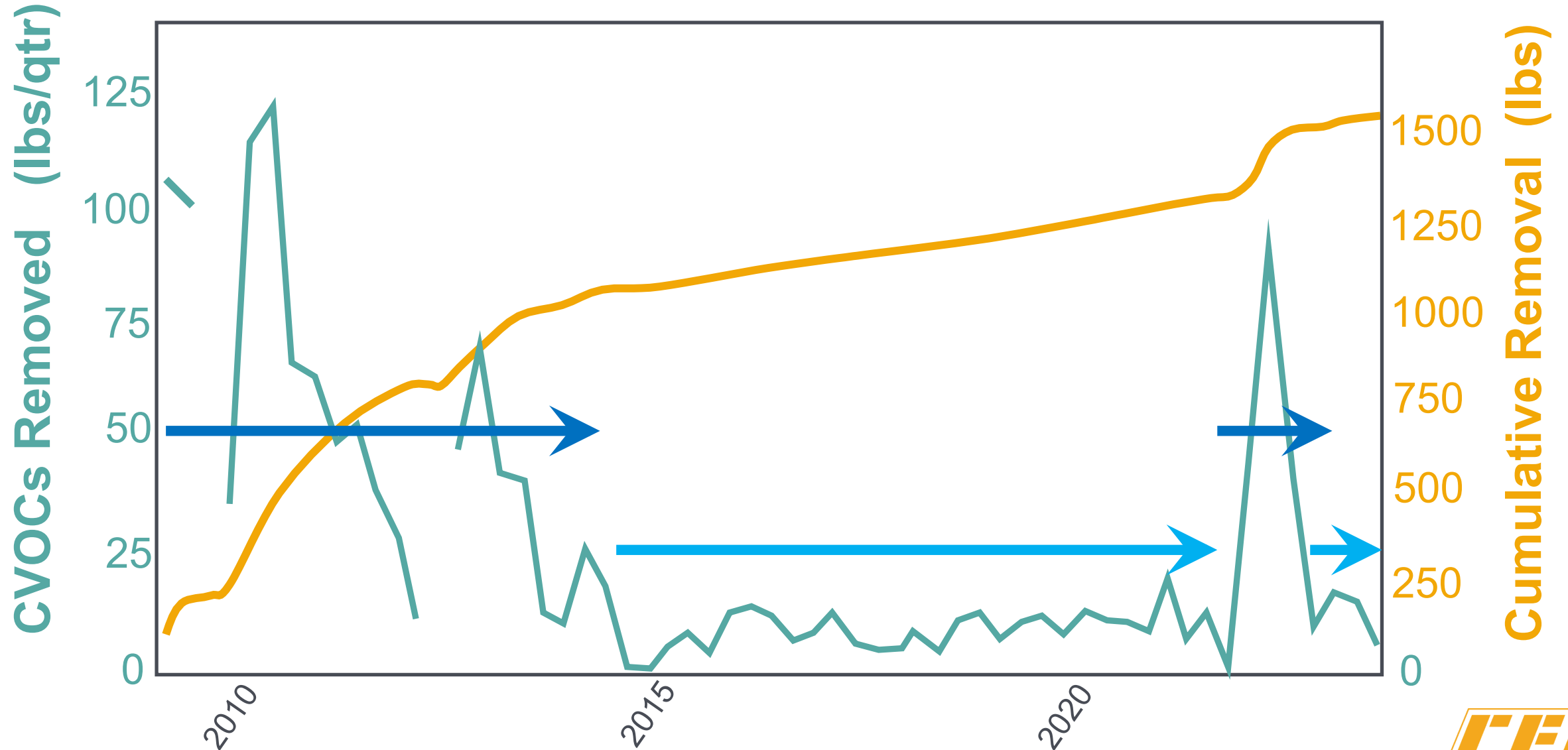


SVE/SSDS



- SVE - 2 horizontal wells
- SSDS – 4 vertical wells

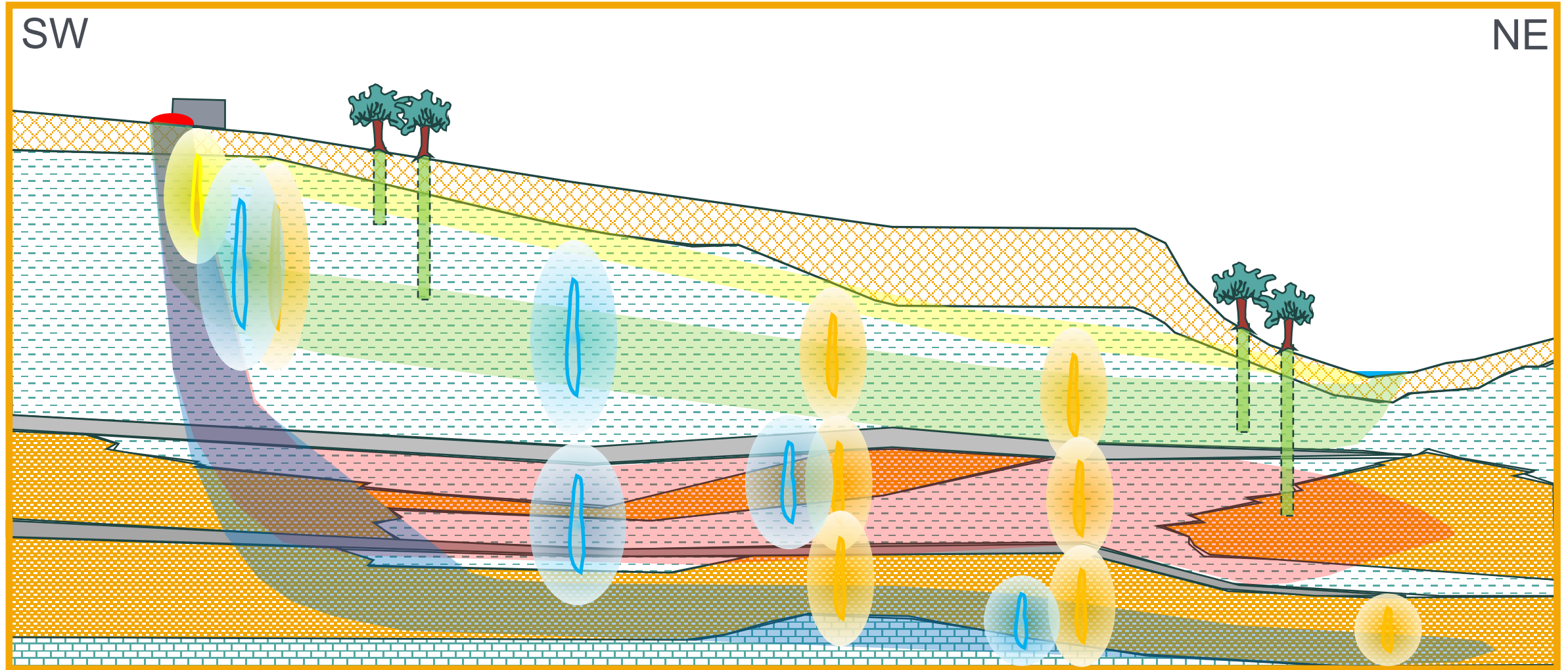
SVE System/SSDS VOC Removal



Soil Removal



Phyto/ERD Injection



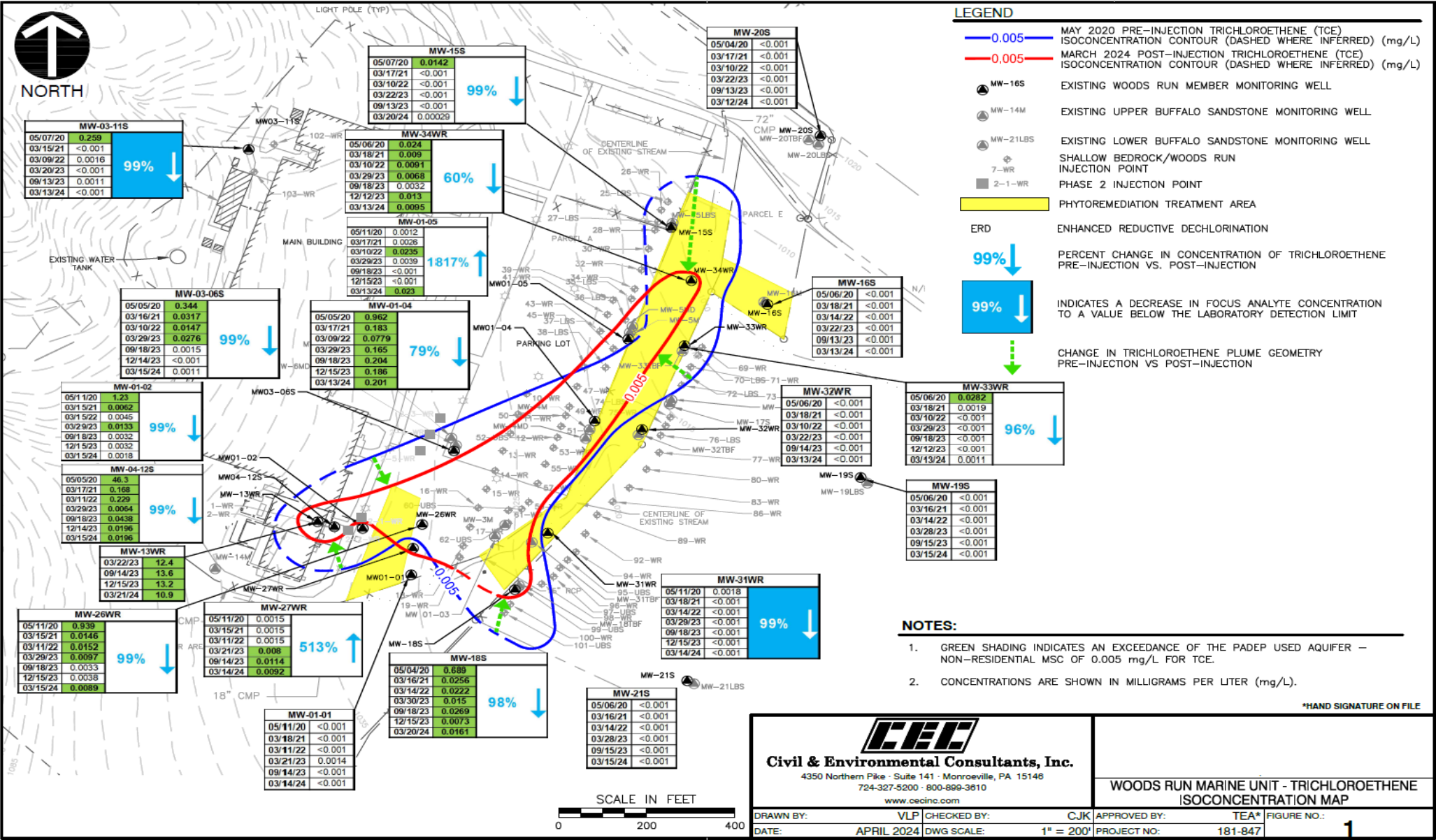
Phytoremediation Aerial – April 2023



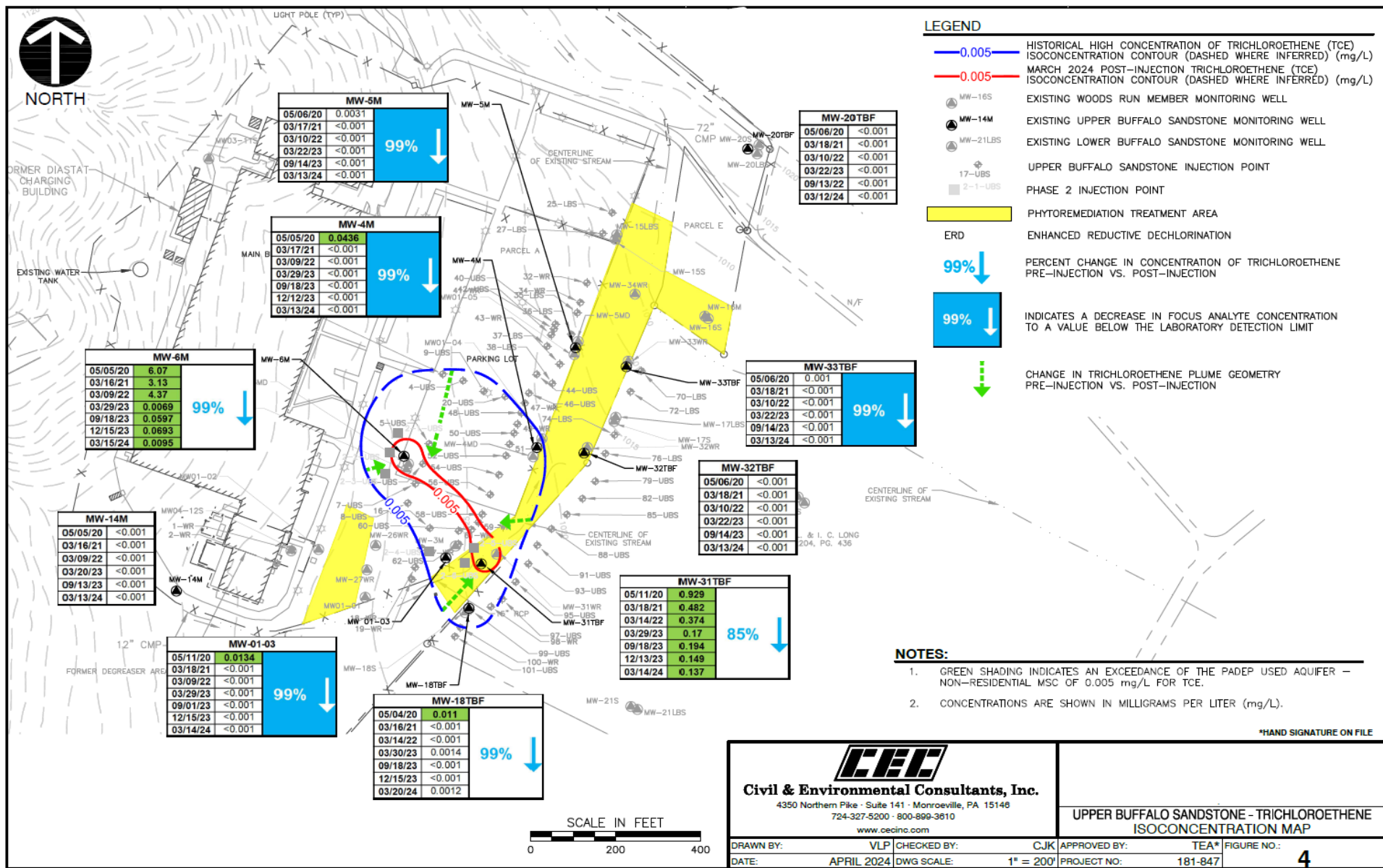
ERD Implementation

- Amendments
 - 3DMe®
 - SDC-9™/BDI Plus
 - CRS®
- Application
 - Soil/Bedrock Interface -11 Initial Points/4 Second Phase
 - Marine Shale – 45 Initial Points/21 Second Phase
 - Upper Sandstone – 30 Initial Points/14 Second Phase
 - Lower Sandstone – 27 Initial Points/11 Second Phase

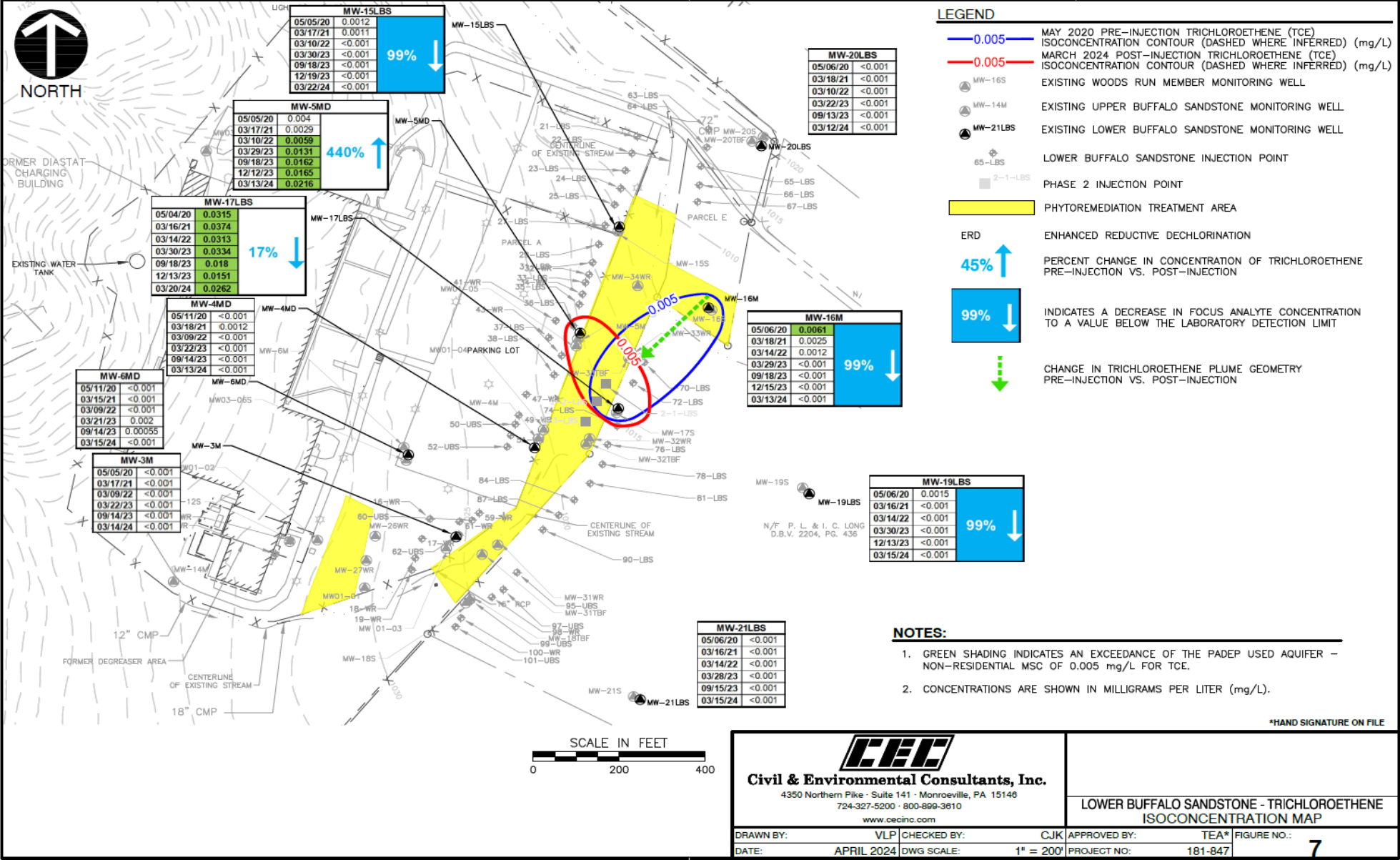
Marine Shale Pre/Post ERD Plumes



Upper Sandstone Pre/Post ERD Plumes



Lower Sandstone Pre/Post ERD Plumes



Summary

HRSC Investigation

- Soil vapor monitoring points/Vapor pins
- Soil borings
- GW mon wells
- Multi-zone pumping tests

Remedial Actions

- Soil Removal
- SVE/SSDS
- ANS TreeWells
- ERD

Groundwater plume is contained,
and mass reduction efforts continue

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Questions?