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A Siemens Healthineers Company

Technical Advisory Group (TAG) Meeting

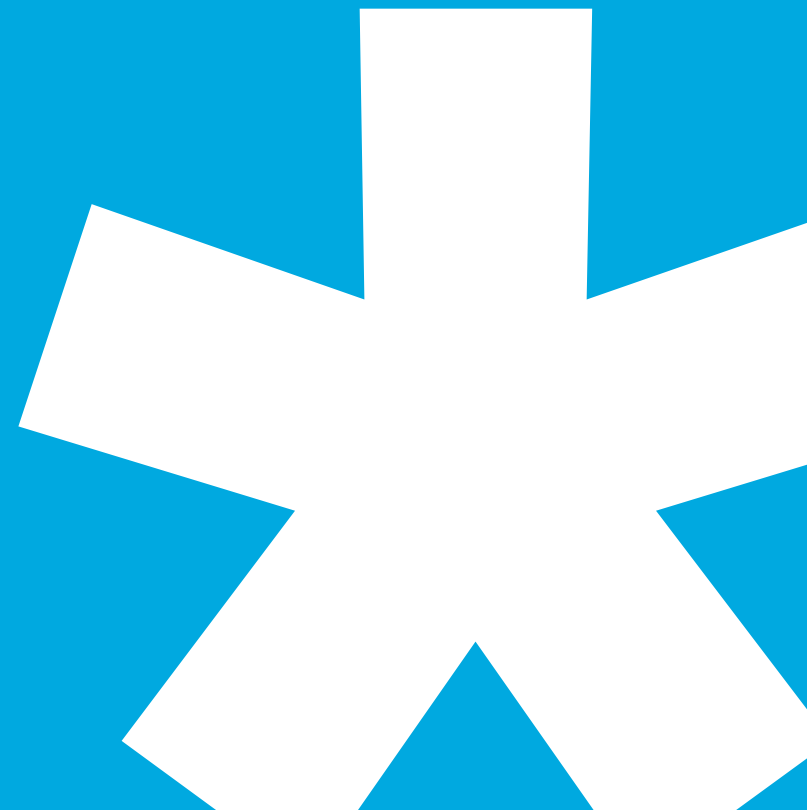
Former Varian Facility (Site 3-0485)

150 Sohier Road

Beverly, Massachusetts

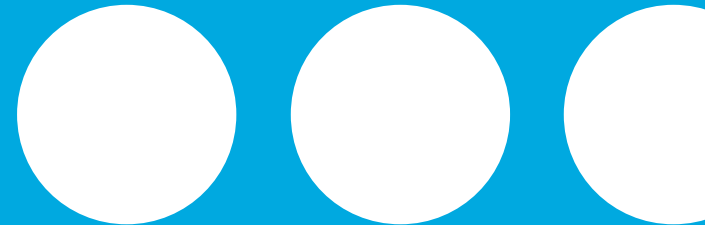
January 15, 2025

Beverly Middle School



Agenda

- Greetings and Agenda Review
- Summary of Activities Since the September 2024 Public Meeting
- Status of Treatment System Design and Construction
- Upcoming Submittals and Events





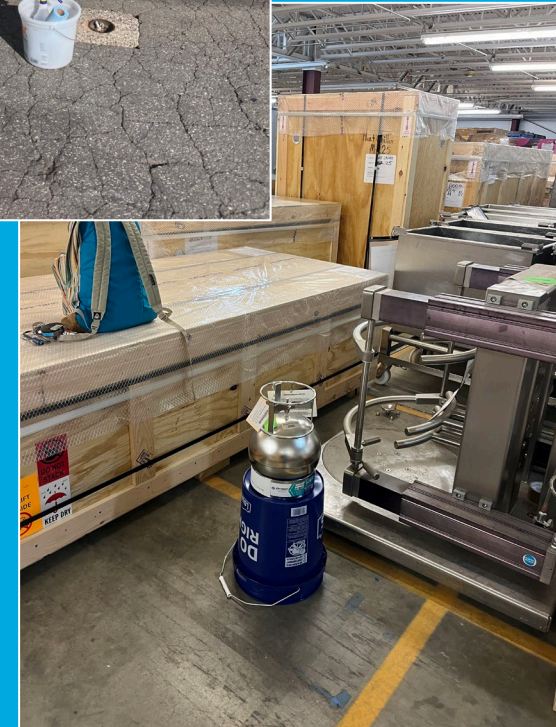
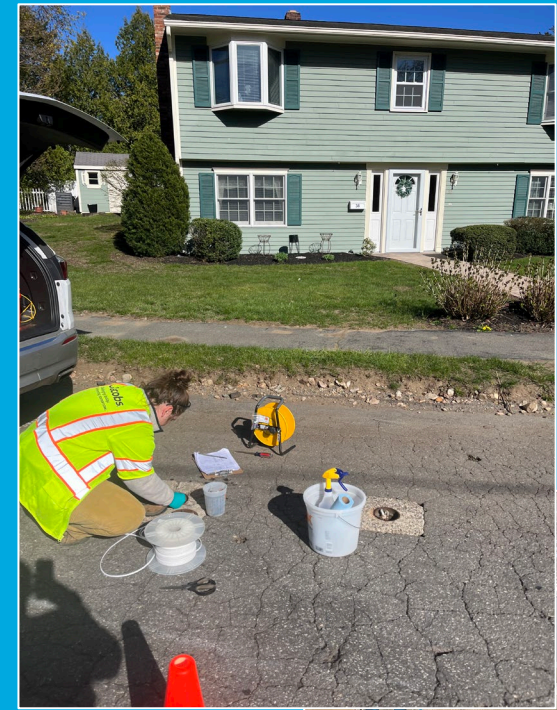
Summary of Activities Since the September 2024 Public Meeting

➤ Submittals

- Monthly email updates
- Public involvement meeting summary
- Annual fact sheet

➤ Activities

- **Building 3 Area** – Exterior drilling at Building 3 nearly complete and interior should start this week
- **Tozer Rd** – Pre-design investigation activities complete and access negotiation for barrier installation underway
- **PSL-10** – Field tasks initiated for treatment installation
- **Bedrock** – Additional geophysical testing for bedrock treatment
- **Monitoring** – Site-wide groundwater sampling and routine indoor air testing completed



Status of Treatment System Design and Construction

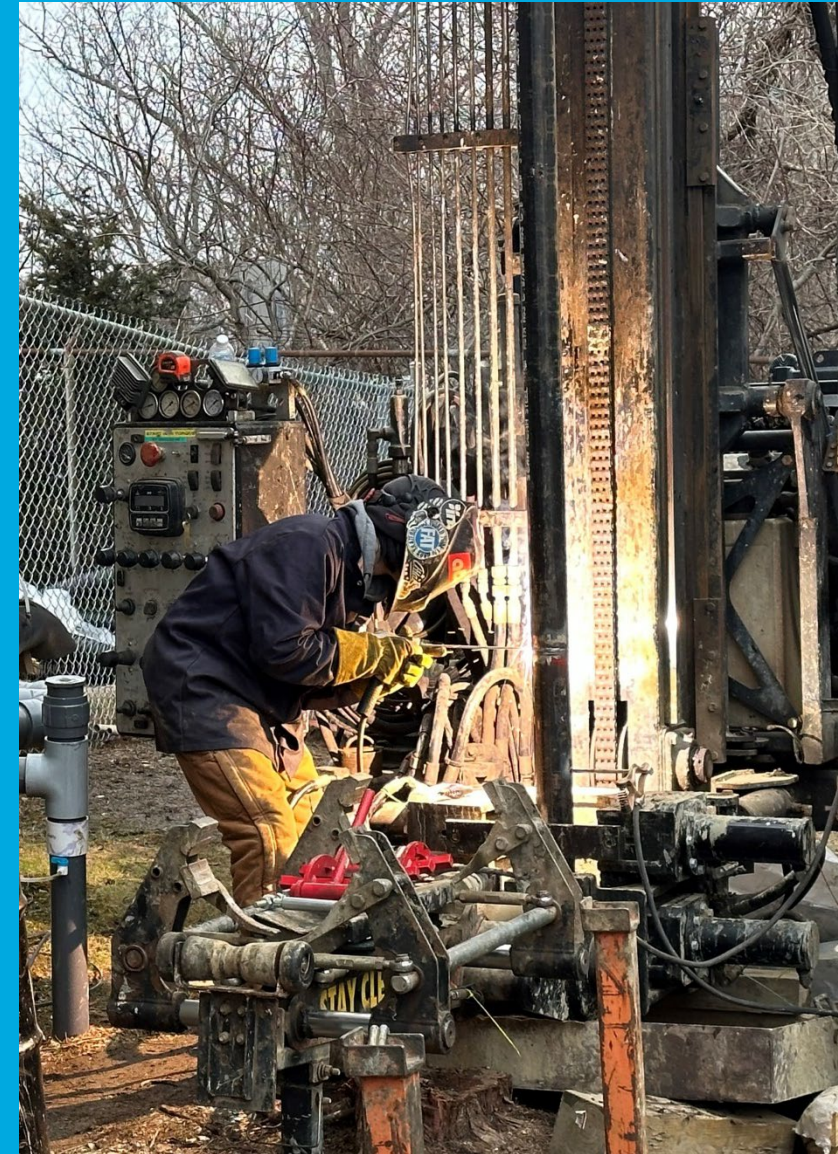


Angled drilling in Building 3 Area

Building 3 Source Area

- ❖ In situ thermal treatment
- ❖ In situ bioremediation polish
- ❖ Continued soil vapor extraction (SVE)

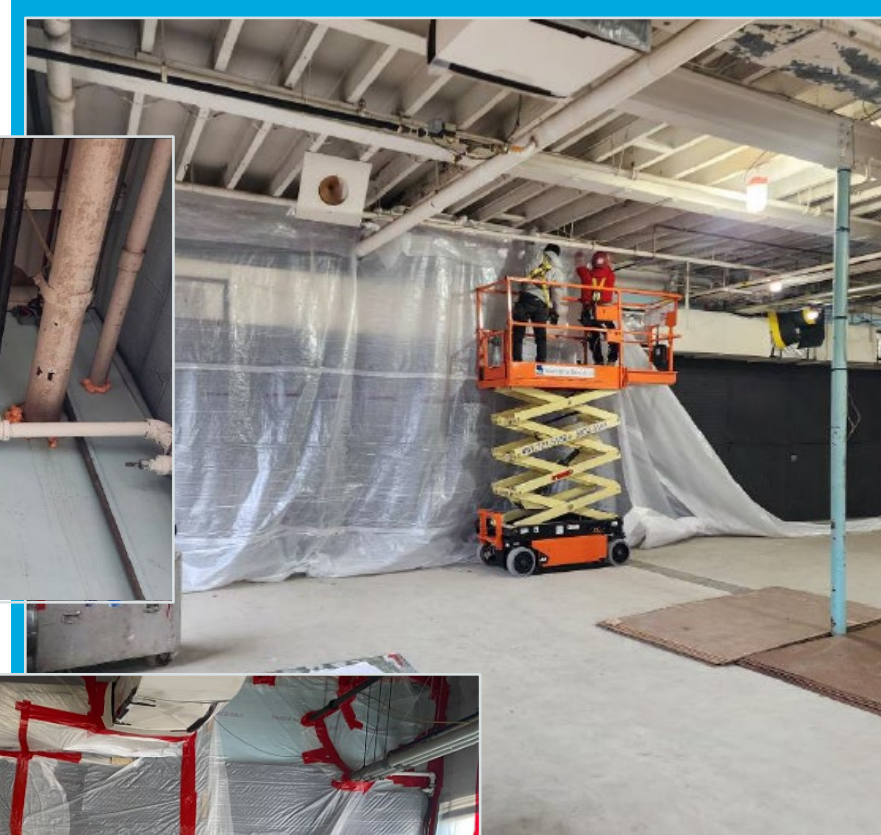
- Thermal treatment system construction underway
 - National Grid electrical service pending installation
 - Mechanical ventilation equipment installed for Building 3 basement
 - Detailed evaluation of Building 2/3/5/6 ventilation system ongoing
 - Completed survey to identify potential vapor intrusion pathways
 - Outdoor drilling operations nearly complete
 - Stockroom preparation for indoor drilling operations is complete
 - Preparation for temporary use of Route 128 right-of-way
- Detailed evaluation of system layout ongoing to treat residual source material encountered during summer drilling



Welding sections
of a heating well

System Construction Status

- Major drilling milestone is nearing completion
 - Exterior drilling concluding
 - Indoor drilling operations (3rd shift) underway
- Preparation for indoor drilling has continued
 - Baseline indoor air monitoring
 - Overhead door installation
 - Stockroom isolation and sealing
 - Vibration monitoring network establishment
 - Subsurface indoor utility clearance beginning
- Work area preparation
 - Utility mapping for Route 128 right-of-way fence relocation
 - Coordination for electrical service installation
 - Installation of mobile vapor control and treatment equipment



Sealing walls and conduits in the Building 3 stockroom (interior drilling area)

Indoor Drilling and System Construction



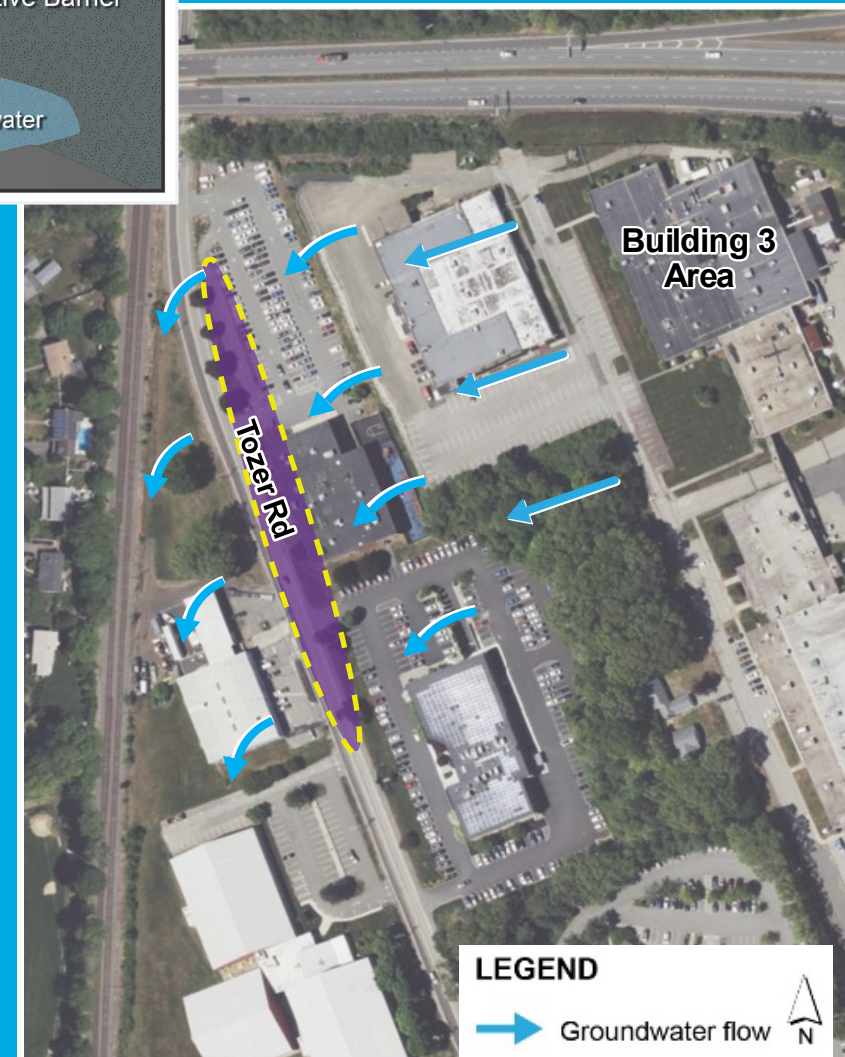
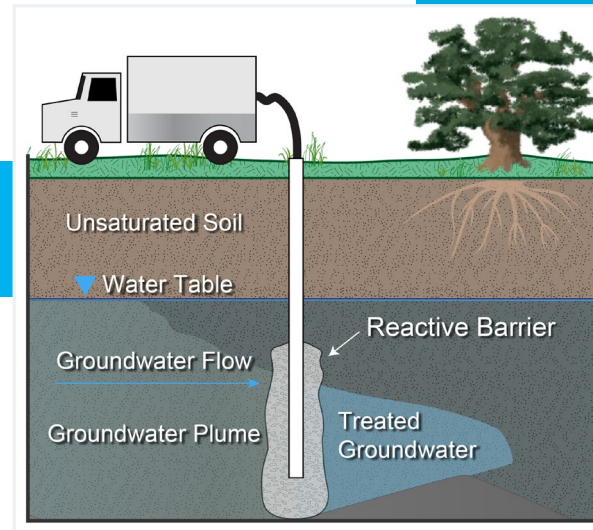
Sealing walls and conduits in the Building 3 stockroom (interior drilling area)

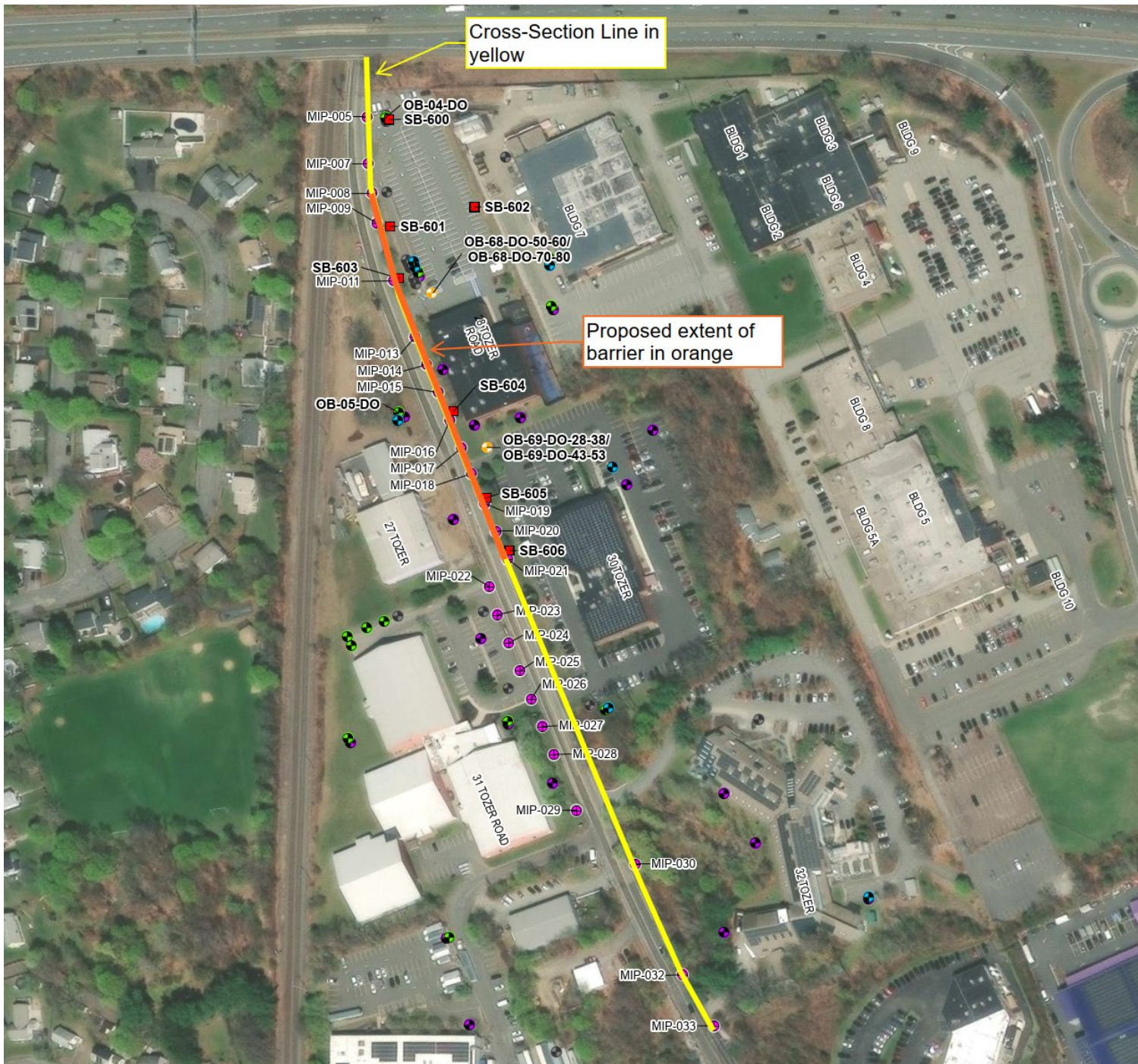
- Drilling requires precision and detail focus
 - Slab removal
 - Utility clearance
 - Potential chemical hazards
 - Noise and vibration control
- Maintaining safety is paramount
- System construction will include the drilling of angled well clusters adjacent to interior walls
- Nightshift construction to limit facility disruption and disturbances

Tozer Road Groundwater

❖ Permeable reactive and adsorptive barrier

- Remedial activities completed to provide data to design the barrier
 - Membrane Interface Hydraulic Profiling Tool (MiHPT) investigation
 - Installation of 4 monitoring wells
 - Deployment of flux meters
 - Soil and groundwater sampling
- Next Steps
 - Installation of new monitoring wells downgradient, and within the treatment area
 - Baseline groundwater sampling
 - Injection of amendments to form a permeable treatment zone along Tozer Road
 - Monitoring during injection
 - Post-remediation monitoring to assess barrier performance





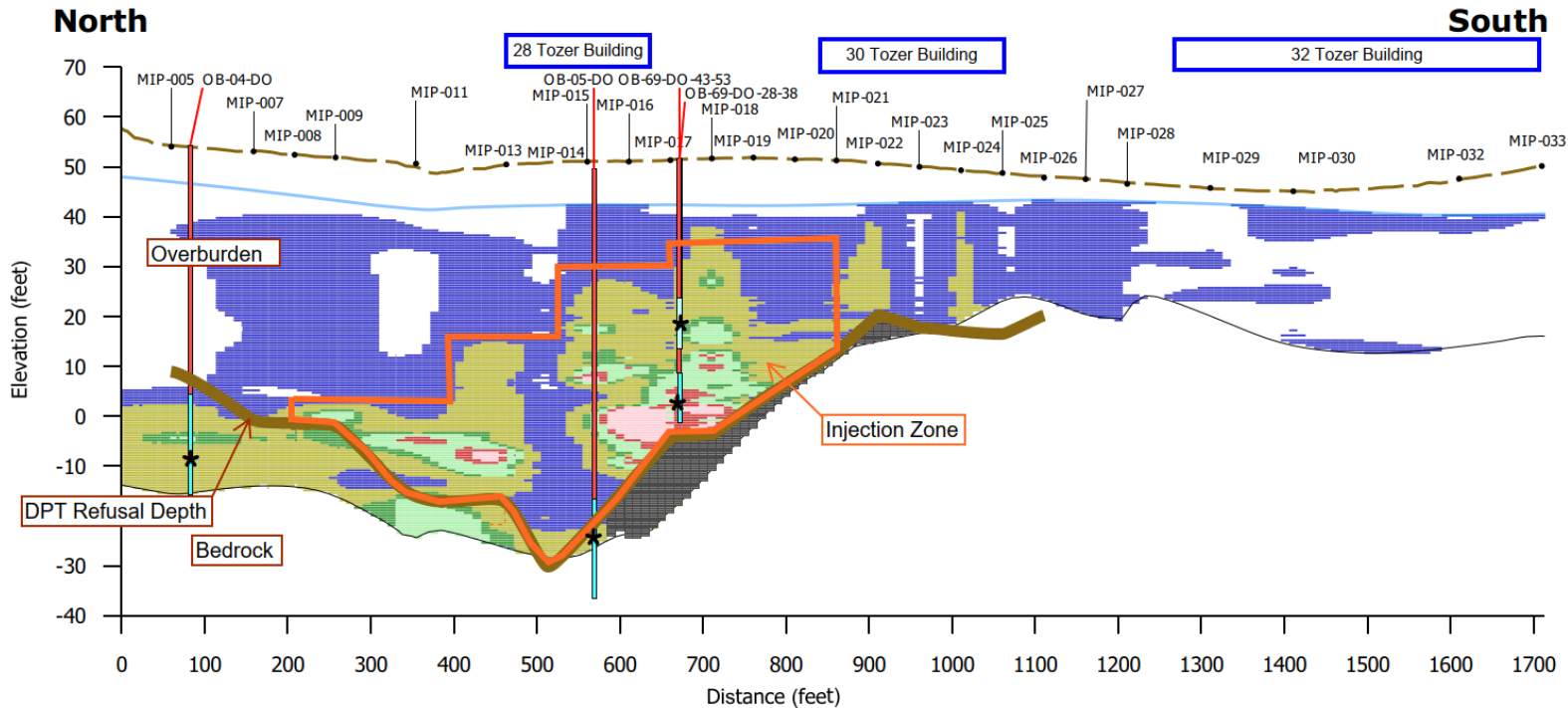
Pre-design Investigation

- Data collected along 2,100-foot length of Tozer Road (from north of Rte 128 to 16 Tozer Rd)
- Data evaluated and models created to evaluate VOC mass moving across Tozer Road
- Barrier design refined based on data



Groundwater sampling at night

Tozer Road Cross Section Chlorinated VOC Mass Flux (units of mg/ft²/day)



VOC Mass Movement and Treatment Barrier Alignment

- “Mass flux” – the rate at which VOC mass flows per unit of area
- Highest areas of mass flux shown in red and pink
- Projected barrier installation area outlined in orange to encompass bulk of VOC mass movement
- Barrier to be installed with a direct push technology (DPT) drill rig
 - Will install to depths of refusal
 - Based on prior DPT drilling will encounter refusal prior to bedrock

Performance Wells and Barrier

- Install new monitoring wells
- Collect baseline samples
- Install barrier between MIP-008 and MIP-021 (orange line)
- Drilling and injections will be conducted in the City's right-of-way
- Post-injection performance monitoring will be conducted once barrier installation is complete

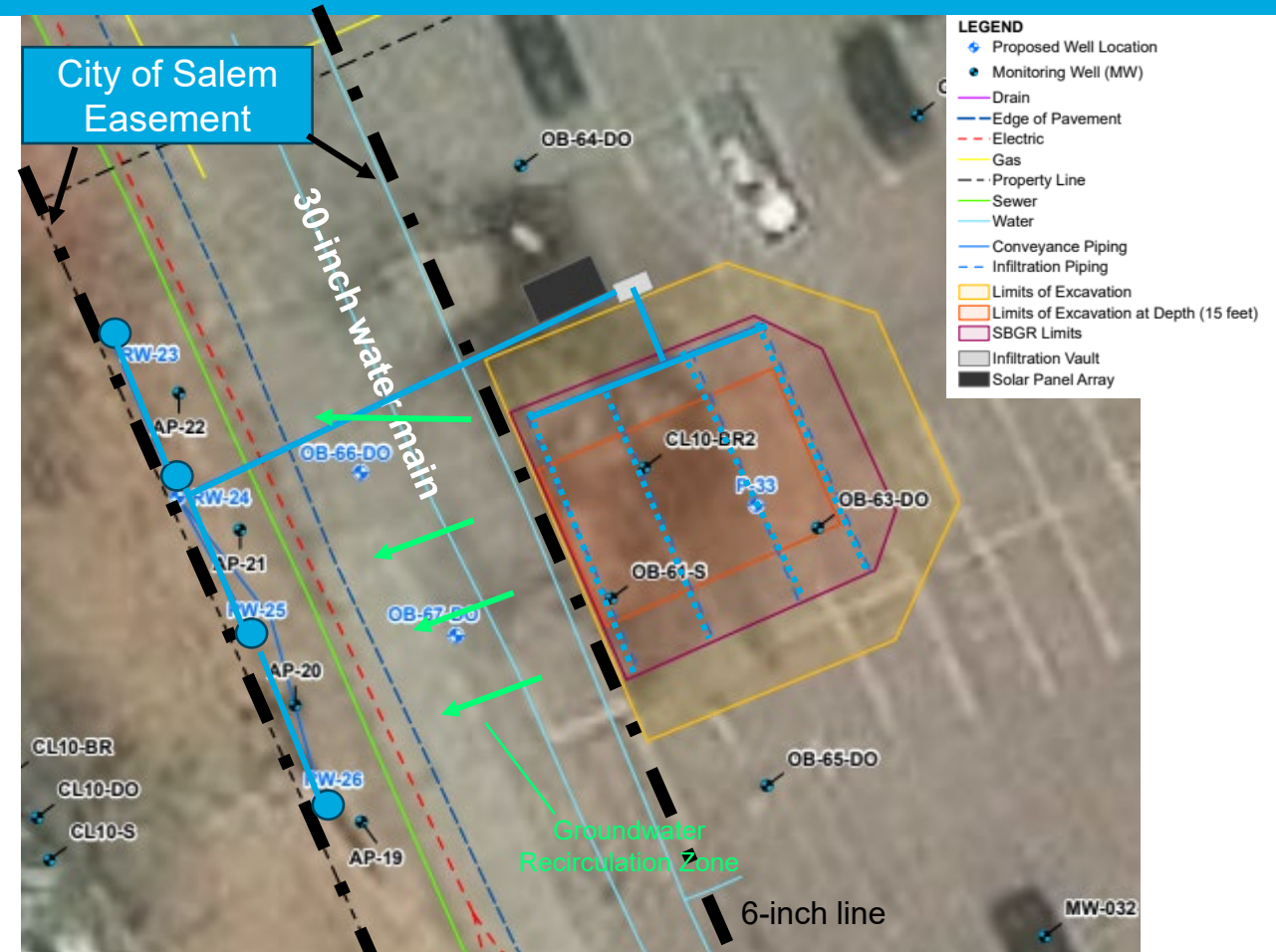
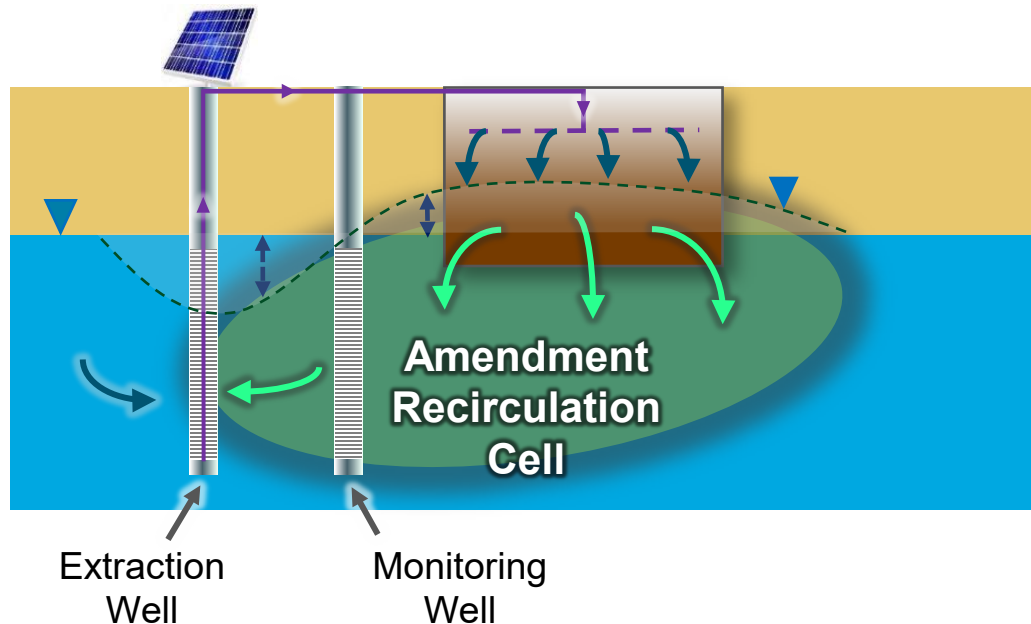


PSL 10

❖ Subgrade biogeochemical reactor (SBGR)

➤ SBGR includes

- Excavation of impacted soil
- Backfill with treatment media
- Pumping of water through the treatment cell to clean groundwater



Installation Activities Have Started



30-inch water main (Nov 2024)



Soil excavation for SBGR (Jan 2025)



Soft digging to locate utilities (Nov 2024)



Recovery well drilling (Dec 2024)

➤ Activities Completed

- Located utilities including 30-inch water main from 1870s
- Installed recovery wells and performance monitoring wells
- Started main excavation

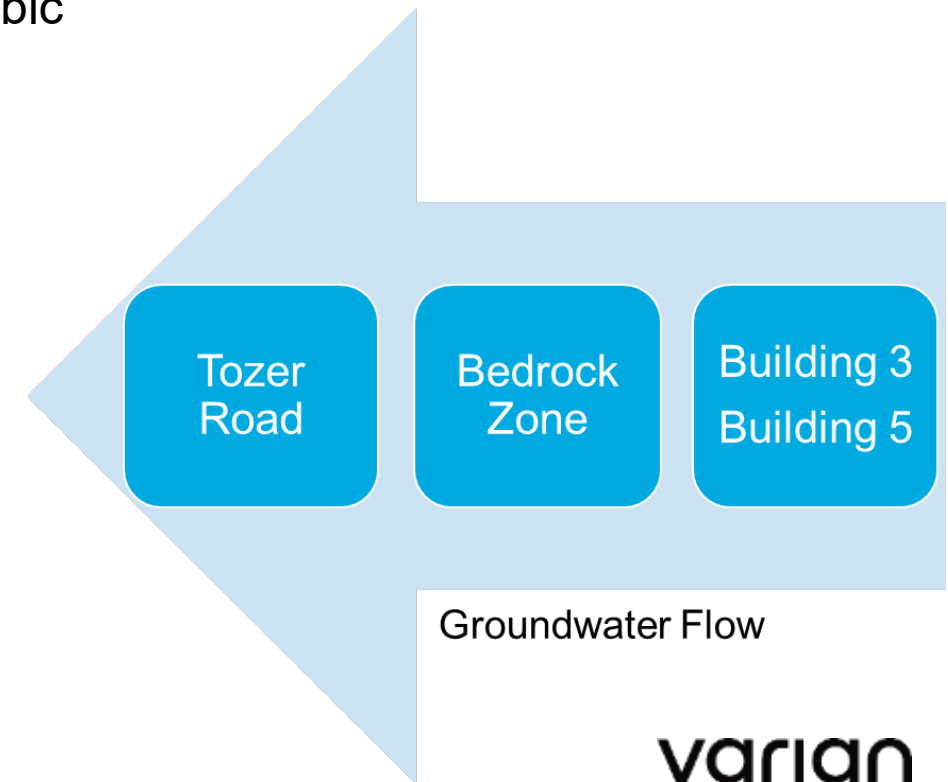
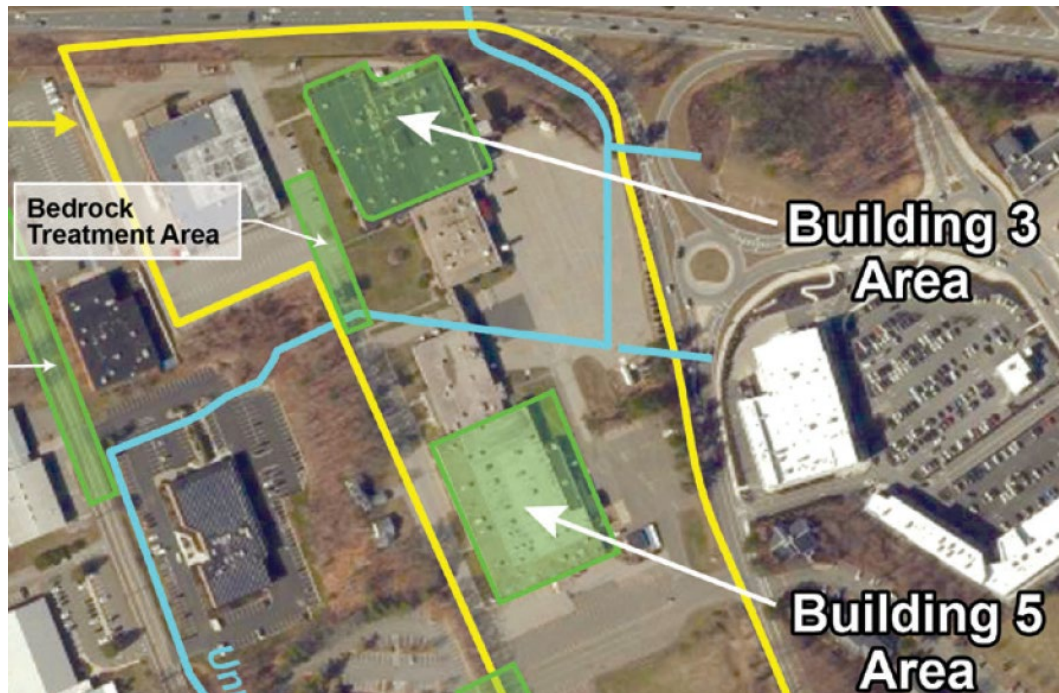
➤ Next Steps

- Excavate and dispose of VOC impacted soils
- Backfill with treatment materials
- Installation of piping and pumps
- System startup
- Monitoring

Bedrock

❖ In situ chemical reduction (ISCR)

- ISCR is an anaerobic process
 - Zero-valent iron + emulsified vegetable oil
 - Upgradient source area and Tozer Road remedies are anaerobic
 - Complementary approach



Bedrock

❖ In situ chemical reduction (ISCR)



➤ Activities Completed

- Sampled new and existing wells
- Completed one surface geophysical survey; second one underway to assess bedrock conditions

➤ Next Steps

- Evaluate the data to provide a 3D view of fracture networks
- Install injection wells
- Inject amendments to destroy contaminants in place
- Collect post-injection groundwater samples

Building 5

- ❖ In situ bioremediation
- ❖ Continued soil vapor extraction

- Pre-design investigation and initial treatment
 - Includes vertical and angled wells
 - Completed structural evaluation in August 2024 ahead of pneumatic injection
 - Well installation with pneumatic injection of sand + zero-valent iron (ZVI) + emulsified vegetable oil (EVO) to enhance permeability
 - Plan to start once evaluation is done and Tozer Road barrier is in place
- After pre-design investigation and initial treatment, will complete additional treatment in shallow areas, as needed



System Installation Schedule*

Treatment Area	Design Complete	System Installation	Start of Treatment	Monitoring
Building 3 (Thermal)	Complete	In Progress	Fall 2025	2025
Tozer Rd (Barrier)	Complete	Winter/Spring 2025	Winter/Spring 2025	2025
PSL10 (SBGR)	Complete	In Progress	Winter/Spring 2025	2025
Building 5 (Bio)	Winter 2025	Spring 2025	Spring 2025	2025
Bedrock (ISCR)	Winter 2025	Spring/Summer 2025	Spring/Summer 2025	2025
Stream A (Mat)	Complete	Complete	Complete	Ongoing

NOTES:

* = Estimated schedule, subject to change

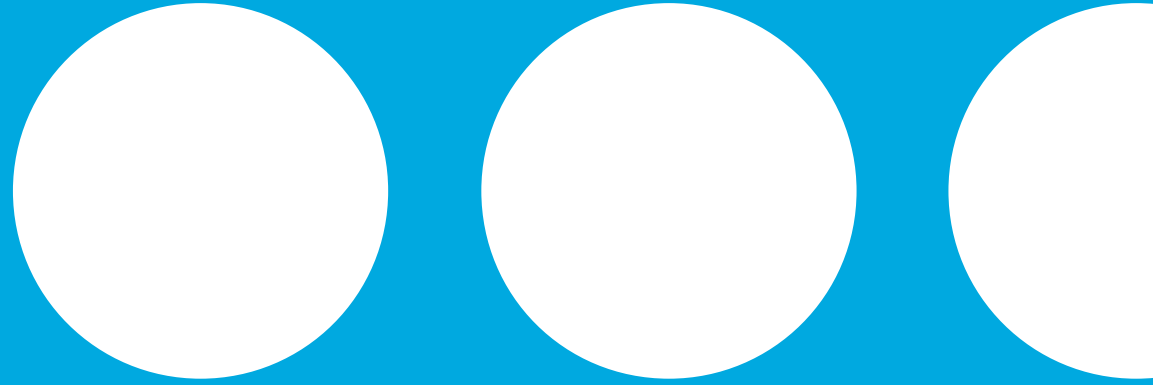
Bio = Bioremediation

ISCR = In situ chemical reduction

Mat = Reactive core mats

SBGR = Subgrade Biogeochemical Reactor

Upcoming Submittals and Events



Upcoming Submittals and Events

2025 Deliverable Schedule

- Phase IV/Temporary Solution Status Report (February 2025) – Biannual status report

Upcoming Meetings

- Quarterly – alternating PIP and TAG meetings
 - Spring PIP – proposed dates Wednesday, April 2 or 16
 - Summer TAG (July)

Environmental Cleanup Update

150 Sohier Road Property, Beverly MA | FALL 2024

This annual fact sheet provides a status of environmental investigation and treatment of the former Varian Facility at 150 Sohier Road in Beverly, Massachusetts.

Environmental Treatment System Installation Underway

In 2024, the Varian project team continued the installation of treatment systems and completed design investigations to support additional remedies at the Site.

In February 2024, a Temporary Solution Statement was submitted to the Massachusetts Department of Environmental Protection (MassDEP) and subsequently presented to the Beverly community. This statement, prepared by a Massachusetts Licensed Site Professional (LSP), indicated that the Site does not pose a human health risk, but that treatment needs to continue or be expanded to achieve a Permanent Solution. The cleanup plan that the project team has prepared will achieve this objective and lead to a Permanent Solution.

The project team is currently working to implement the environmental cleanup plan in six areas at the Site. These areas include (Figure 1):

- Building 3 Source Area
- Tozer Road
- Stream A Seep
- Building 5 Source Area
- Bedrock near Buildings 3 and 5
- PSL-10 (Open Field) Source Area

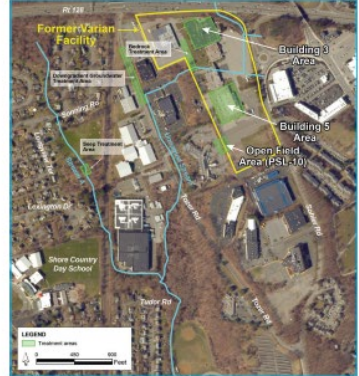


Figure 1. Site map and selected treatment areas

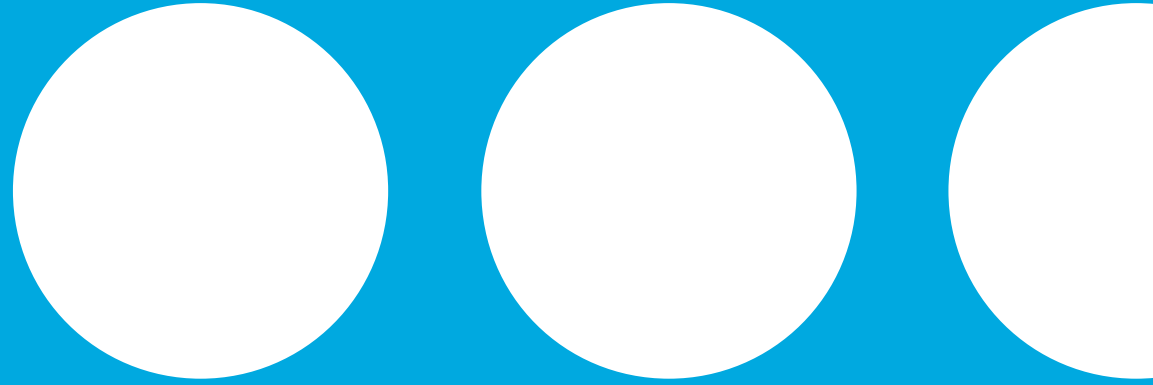
Site History and Overview

The former Varian Facility, located at 150 Sohier Road, is currently owned by another firm and operated as an active manufacturing facility for microwave and radar products. The 150 Sohier Road property has been used as an industrial facility since the early 1950s. Industrial solvents were released to the environment due to the chemical handling and disposal practices that were common at the time, before stricter environmental regulations were enacted. These solvents, used primarily for surface treatment, cleaning, and degreasing operations, included trichloroethene (TCE), perchloroethene (PCE), and 1,1,1-trichloroethane (TCA). Releases of these solvents occurred in three main areas: the Building 3 area, the Building 5 area, and an open field known as potential source location (PSL) 10. TCE, PCE, and TCA are heavier than water and have limited ability to dissolve in water. They also tend to evaporate easily and are referred to as volatile organic compounds or VOCs. Varian, with support from Jacobs Solutions, is investigating and cleaning up the Site in accordance with Massachusetts regulations, known as the Massachusetts Contingency Plan (MCP). The Site is listed by MassDEP as Site Number 3-0485. Site reports and other documentation can be found under "Supporting Documents" in MassDEP's data portal at <https://eeasonline.eea.state.ma.us/portal/dep/wastesite/detailviewer/3-0000485>.

For More Information

- Reports Available
 - Hard copies – Beverly Public Library Reference Desk
 - Online – <https://eeaonline.eea.state.ma.us/EEA/FileViewer/Rtn.aspx?rtn=3-0000485>
- Website – <https://beverlysitecleanup.com/>
 - Overview of environmental investigation and treatment to date
 - Annual fact sheet issued Fall 2024
(https://beverlysitecleanup.com/wp-content/uploads/2024/12/Varian_Fact_Sheet_Fall_2024.pdf)
 - Homepage updated monthly with work progress
 - Public meeting videos and slide decks
 - Links to MassDEP and EPA fact sheets on cleanup technologies
 - E-mail list sign-up
- Email: beverlysitecleanup@jacobs.com

Questions



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