

Community Update – PFAS Remediation

- Groundwater Extraction and Treatment System (GETS)
- Soil Excavation & Removal

*Public Meeting
June 29, 2021*

tyco
Fire Protection Products

Introductions

Katie McGinty – JCI/Tyco

Chief Sustainability Officer

Scott Potter – ARCADIS

Project Hydrogeologist

Kirk Craig – Geosyntec Consultants

Project Manager - GETS Design Finalization, Construction & Startup

Self Introduction – Kirk Craig, P.E.

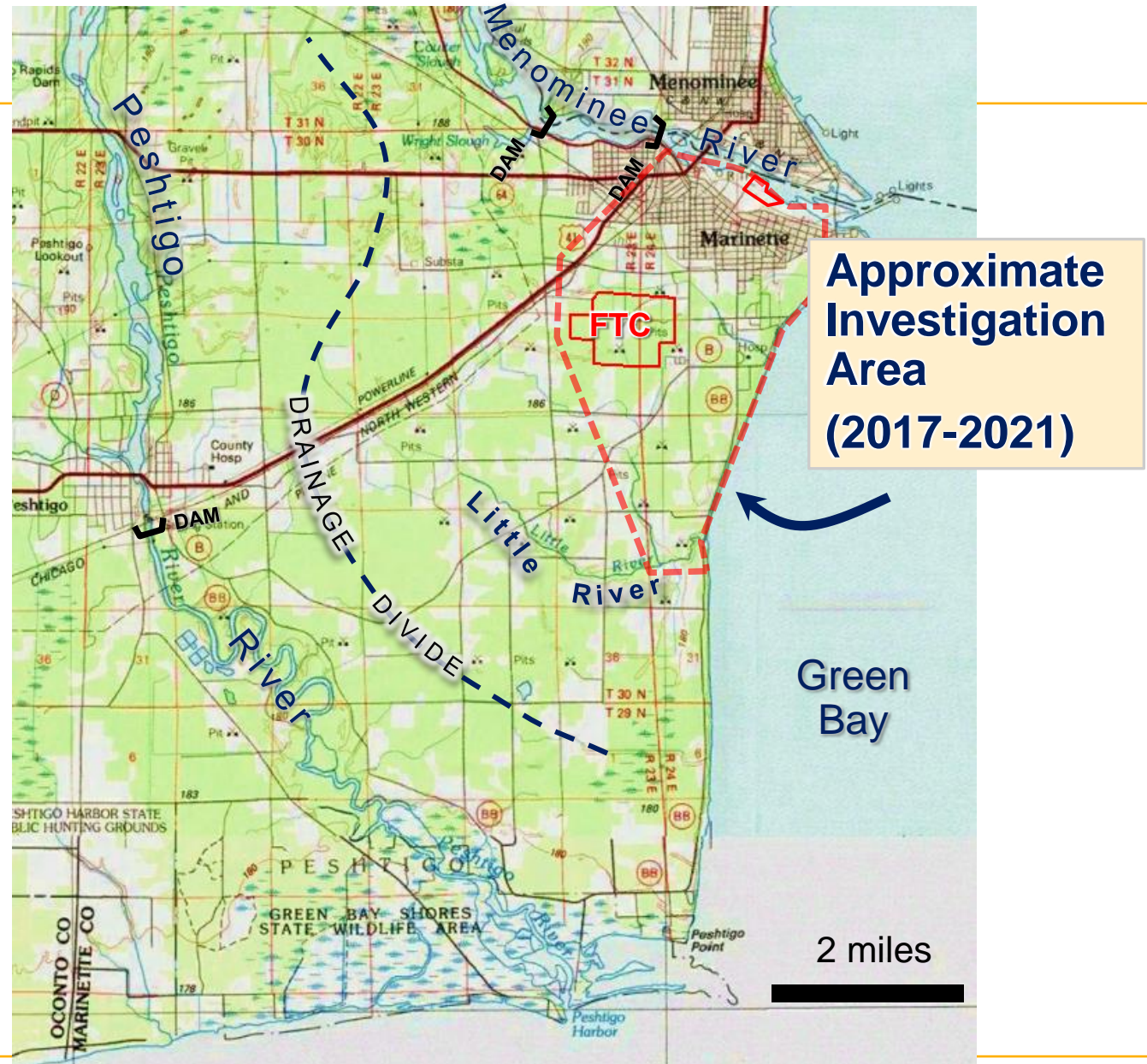
- 25+ years of environmental experience
- Education
 - Undergrad Studies, Michigan Technological Institute
 - B.S., University of Florida
 - M.S., Colorado School of Mines
- Multiple multimillion-dollar, challenging environmental investigations and remedies
 - 35+ site closures
 - 10 Federal Superfund sites
 - 18 State Superfund sites
 - 7 PFAS-impacted sites, including 4 ongoing PFAS investigations of military bases
- Designed, constructed, optimized, and/or operated >100 remedies using a variety of technologies
 - Addressing PFAS and other emerging contaminants
 - Utilizing innovative and emerging technologies



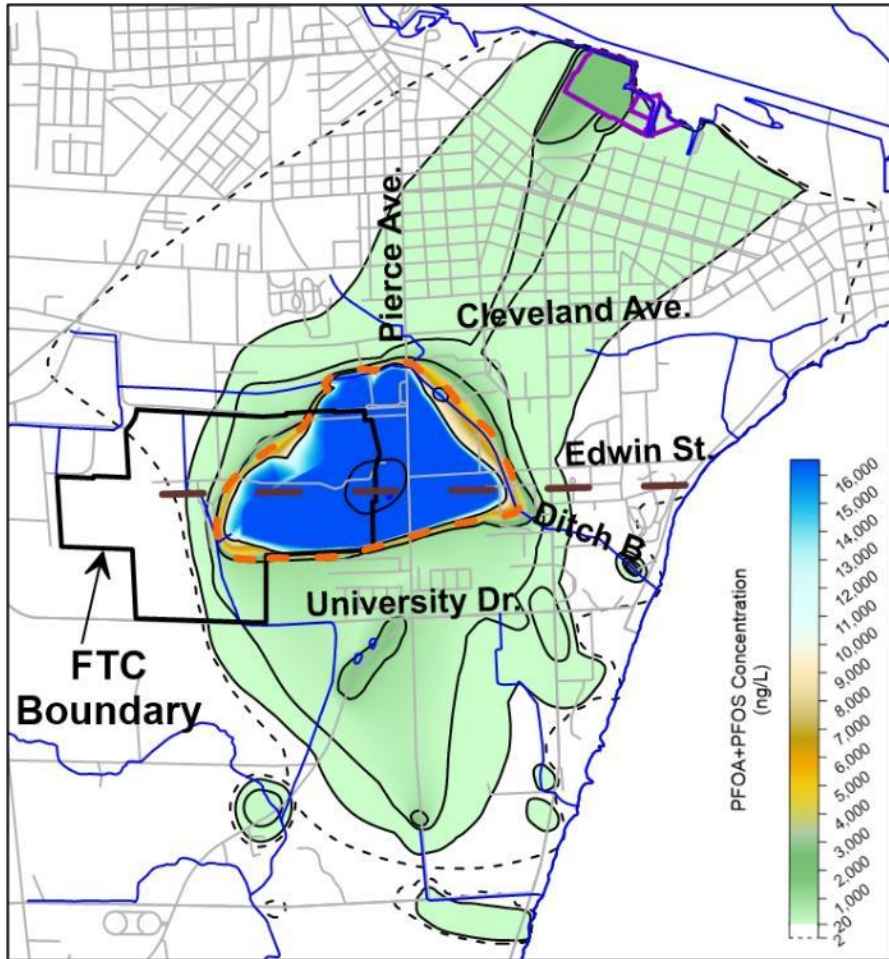
What We Studied

Site Investigation area included portions of City of Marinette and Town of Peshtigo

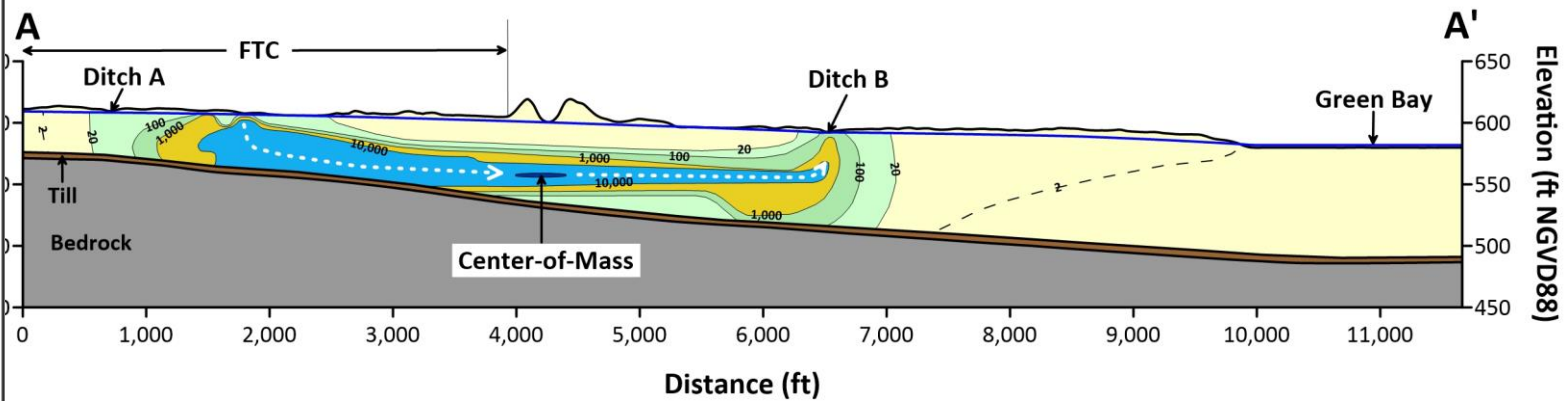
Over 10,000 data points were collected during the investigations to understand site conditions.



Key Finding: PFAS Groundwater Impacts



----- Cross-section through the plume between the FTC and Ditch B

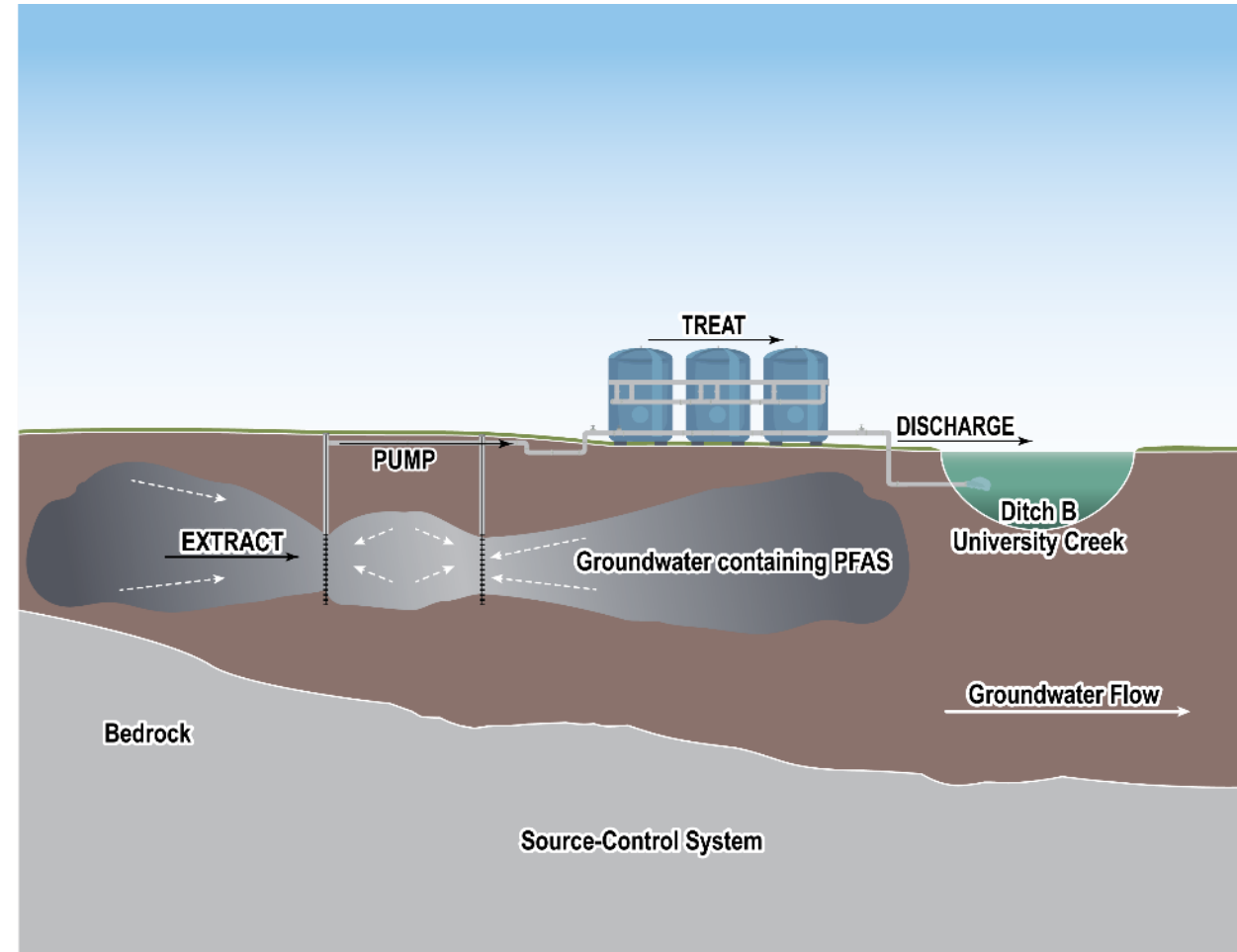


The groundwater and surface water data show the plume is traveling east and discharging to Ditch B

Proposed Remediation Solution: GETS

The primary design objectives for the GETS in the RADR submitted to DNR:

1. Reduce upwelling of PFAS-impacted groundwater into Ditch B.
2. Treat the recovered groundwater and remove PFAS to below regulatory levels.
3. Reduce PFAS-mass flux throughout groundwater plume.



DNR's Approval of the GETS

On May 18, 2021, Wisconsin Department of Natural Resources (WDNR) provided conditional approval of the GETS Interim Remedial Action Design Report (RADR)

“JCI/Tyco’s design for the GETS incorporates current proven technologies for PFAS remediation; is based on the available site data; and aligns with the stated remedial objectives....”

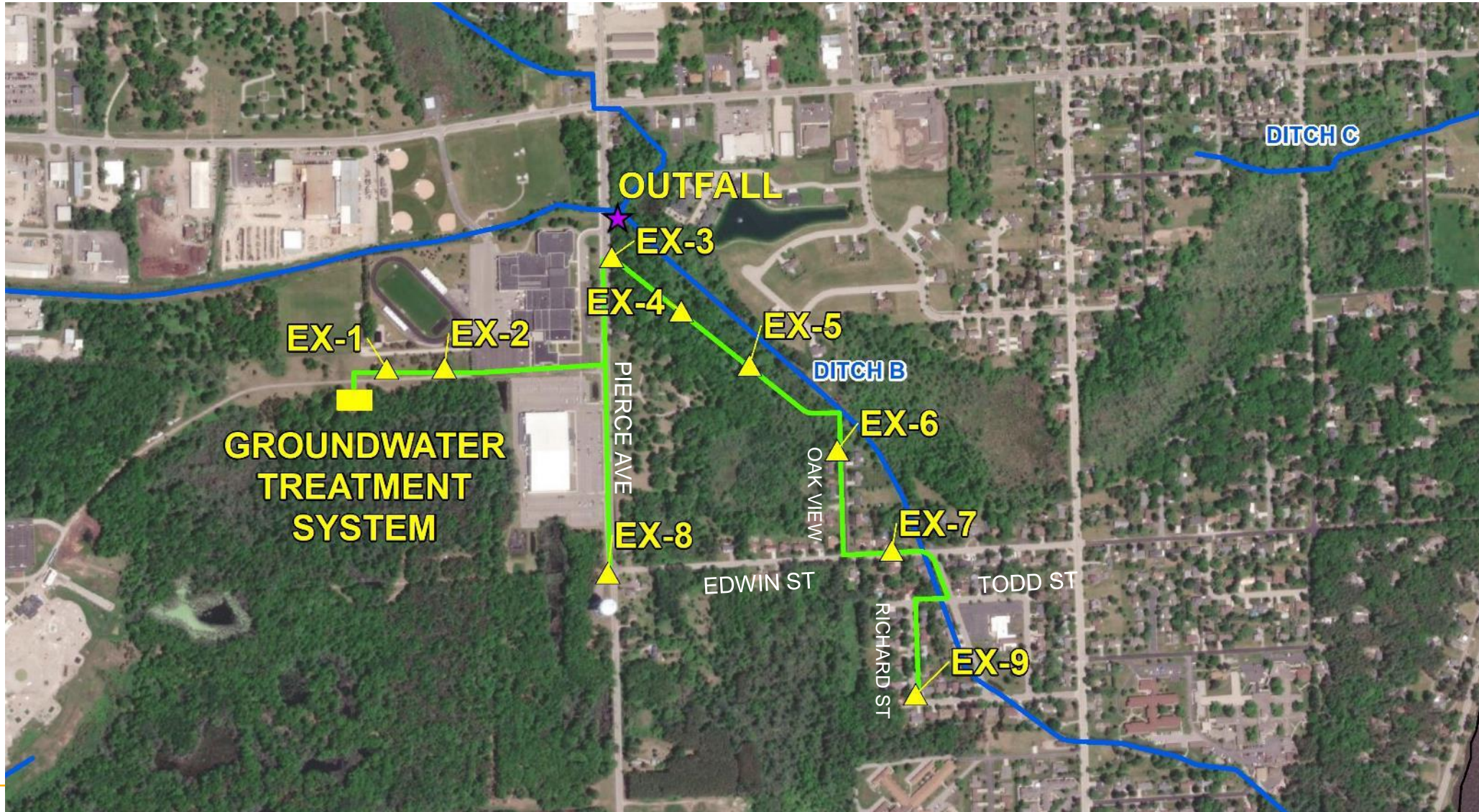
*The DNR thanks JCI/Tyco for its submittal of the GETS RADR and its plans to implement an interim action designed to reduce the migration of PFAS in groundwater and surface water from the FTC and to remove PFAS mass from the environment at the Site. **JCI/Tyco may proceed with the implementation of the GETS interim action subject to the conditions of approval...**”*

Alyssa Sellwood, Complex Sites Project Manager, Wisconsin Department of Natural Resources, GETS Remedial Action Design Report conditional approval Letter dated May 18, 2021

What will the GETS achieve?

The GETS is designed to focus on the area currently shown to contain 95% of the PFAS that came from the FTC over the decades. The PFAS is concentrated in groundwater on the FTC and heading toward Ditch B and the expected capture zone of the GETS. That's the design. Real world operation will tell us how long it will take to achieve objectives and what if any additional measures might be necessary in this area or other areas of the plume.

Well Locations and Piping Routes



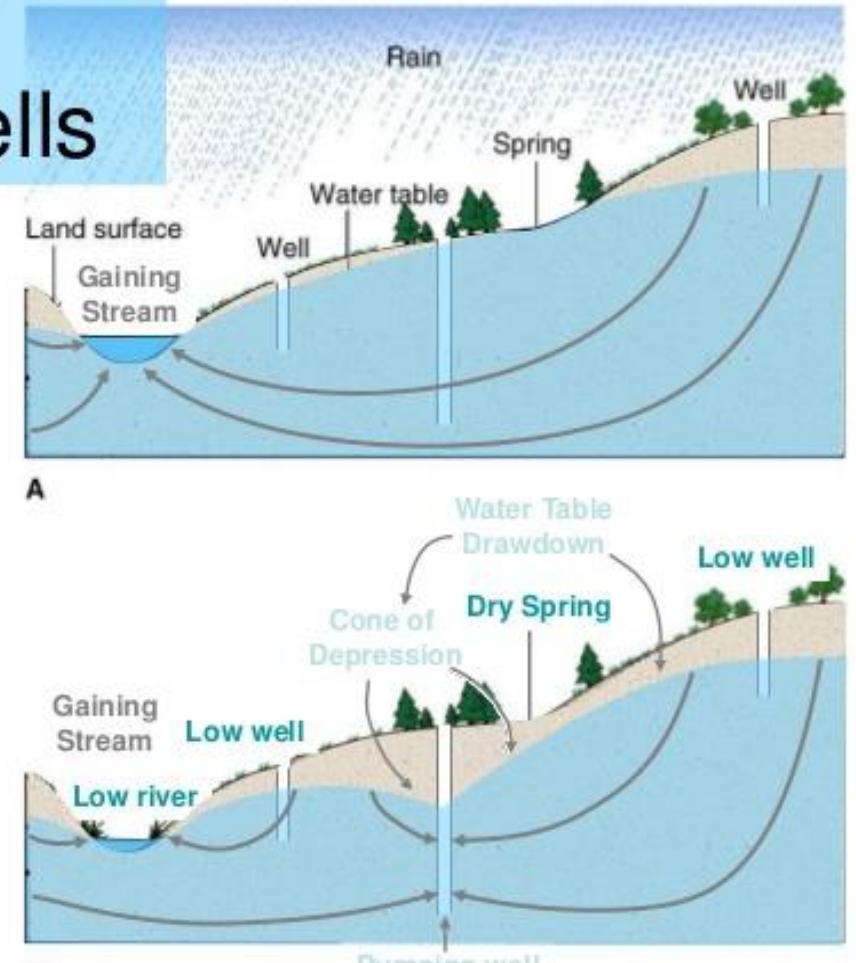
How the Groundwater Extraction Wells Work

The PFAS-impacted groundwater from the source area will be hydraulically captured and treated.

Monitoring will be done to help ensure no adverse impacts on wetlands or water table.

Effects of Pumping Wells

- Pumping wells
 - Accelerate flow
 - Reverse flow
 - Cause water table drawdown
 - Form cones of depression



GETS Extraction Well Installation

9 extraction wells installed using hollow stem auger drilling method

- Six-inch diameter wells to a depth of approx. 50 ft
- Some wells will be installed along the edges of streets in ROWs
 - Traffic control will be required
 - Some minor truck traffic during well development



Completed Extraction Wells

- No wells on residential property
- Above-ground control boxes near wells
 - Similar to large, green pad-mounted electrical transformer
 - None on residential property
 - Vegetation may be used to help camouflage
 - Occasional sampling and monitoring via technician and pickup
- Extraction wellhead in streets in secured traffic-rated, flush-mounted manhole
 - Small truck-mounted hoist rig may be required for pump change out every 3 to 5 years



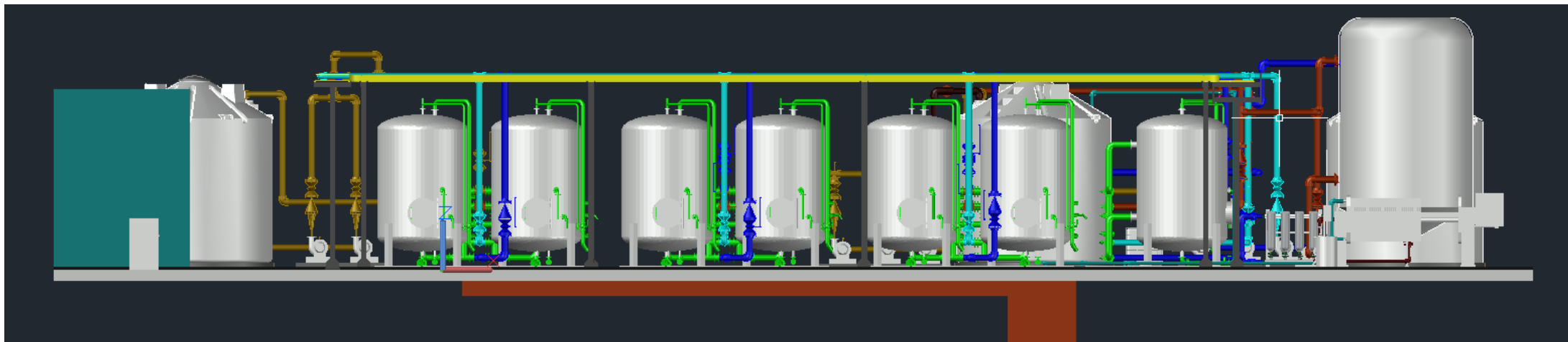
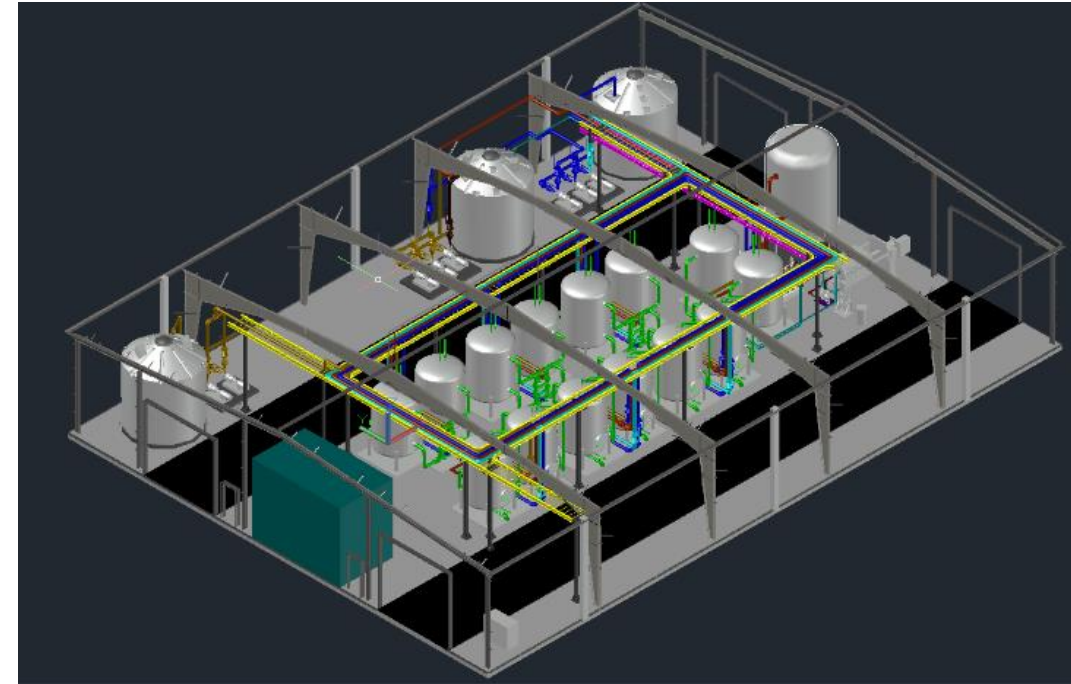
GETS Conveyance Piping

- >28,000 feet of high-density polyethylene (HDPE) subgrade conveyance piping and associated casing
- 18-inch dia. casing for the conveyance piping installed primarily using horizontal directional drilling
 - Casing will house 2- and 4-inch dia. water conveyance piping and conduit
 - Spare conveyance piping installed for operational flexibility or potential additional wells



State-of-the-Art GETS Treatment Building

- Approximately ~12,500 ft² steel building
- Will capture & treat ~120 million gallons/year
- Enhanced pretreatment system for iron removal
- 12 carbon vessels (~120,000 lbs of carbon)
- 2 ion exchange vessels (~10,500 lbs of resin)
- Treated groundwater discharged to Ditch B



Proven PFAS Removal Technologies

Pre-treatment: Clarifier & Sand Filter

- Removes sand, iron/other metals for efficient PFAS removal

(1) Primary PFAS Treatment: Granular Activated Carbon (GAC)

- Most proven & reliable technology for PFAS removal
 - Two 6-vessel trains (one train on standby)
 - Significant redundancy to ensure treatment
- 70 minutes of treatment time
 - Twice as long as typical PFAS system

(2) Polishing PFAS Treatment: Ion-Exchange Resin

- Similar to home water softener
- Potential residual PFAS in water “sticks” to resin



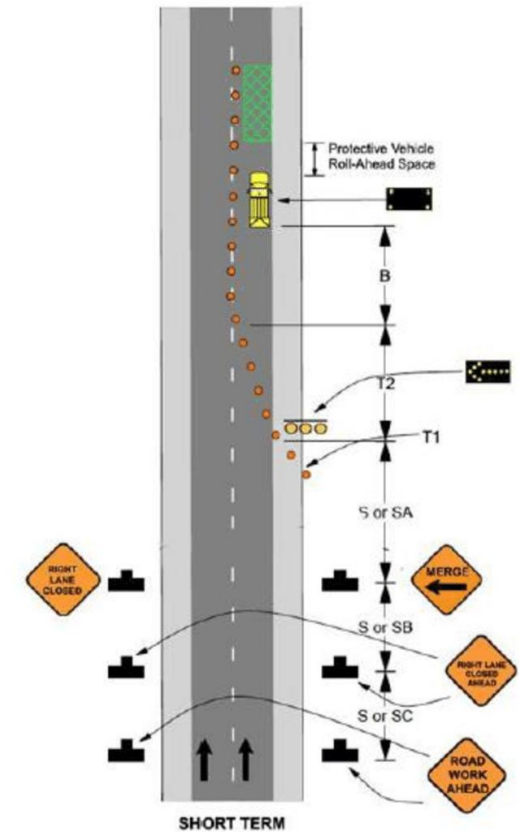
Discharge to Ditch B

- Outfall to be located north of high school and east of Pierce Ave. at Ditch B crossing
- Groundwater that was captured prior to upwelling into Ditch B will be reintroduced as treated water at the Ditch B outfall.
- Discharge of the treated water to Ditch B will further improve the surface water quality.



Safety First

- Community Outreach and Notifications
- Traffic Control
- Site Security



Good Housekeeping

- **Dust Control**
- **Load Covering**
- **Soil-erosion control**
- **Equipment cleaning and decontamination**
- **Water and soil management**

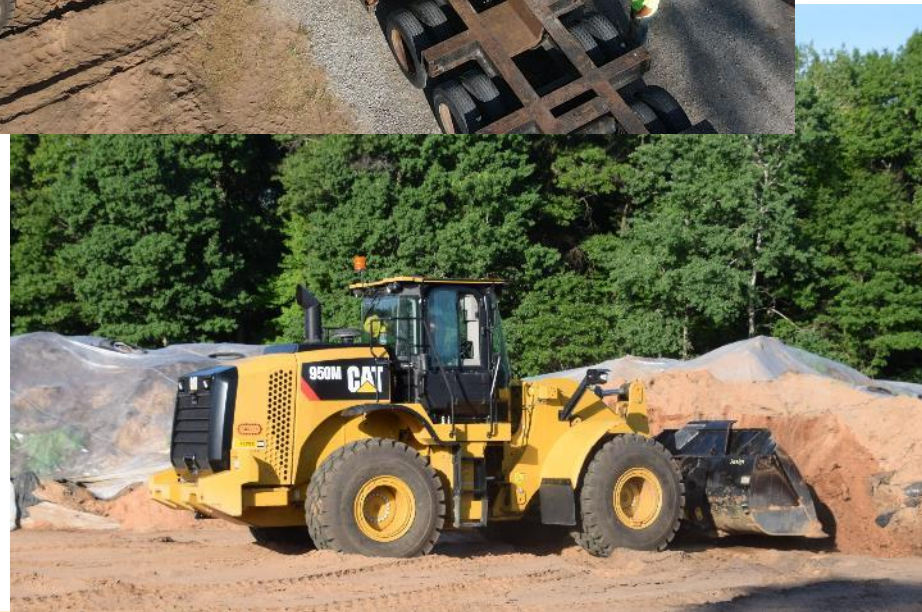


Key Project Elements & Timing

| Project Phases | Start – End Date |
|---|---------------------------------------|
| Permitting | Ongoing throughout Construction Phase |
| Construction | Late summer to December 2021 |
| Construction in Rights-of-Way Installation of conveyance piping, extraction wells and control boxes | Late summer/early fall start |
| Access Road Construction For access to 3 extraction wells & outfall location | Late summer/early fall start |
| Drill Extraction Wells | Fall |
| Site Work & Preparation for Treatment Building | Late summer |
| Delivery & Construction of Treatment Building | Early fall |
| Delivery & Installation of Filtration Technology GAC & Ion Resin vessels & contents | Late 2021 |
| Complete Construction & Startup GETS | Goal: Dec 2021 |

Soil Remediation at FTC Has Begun

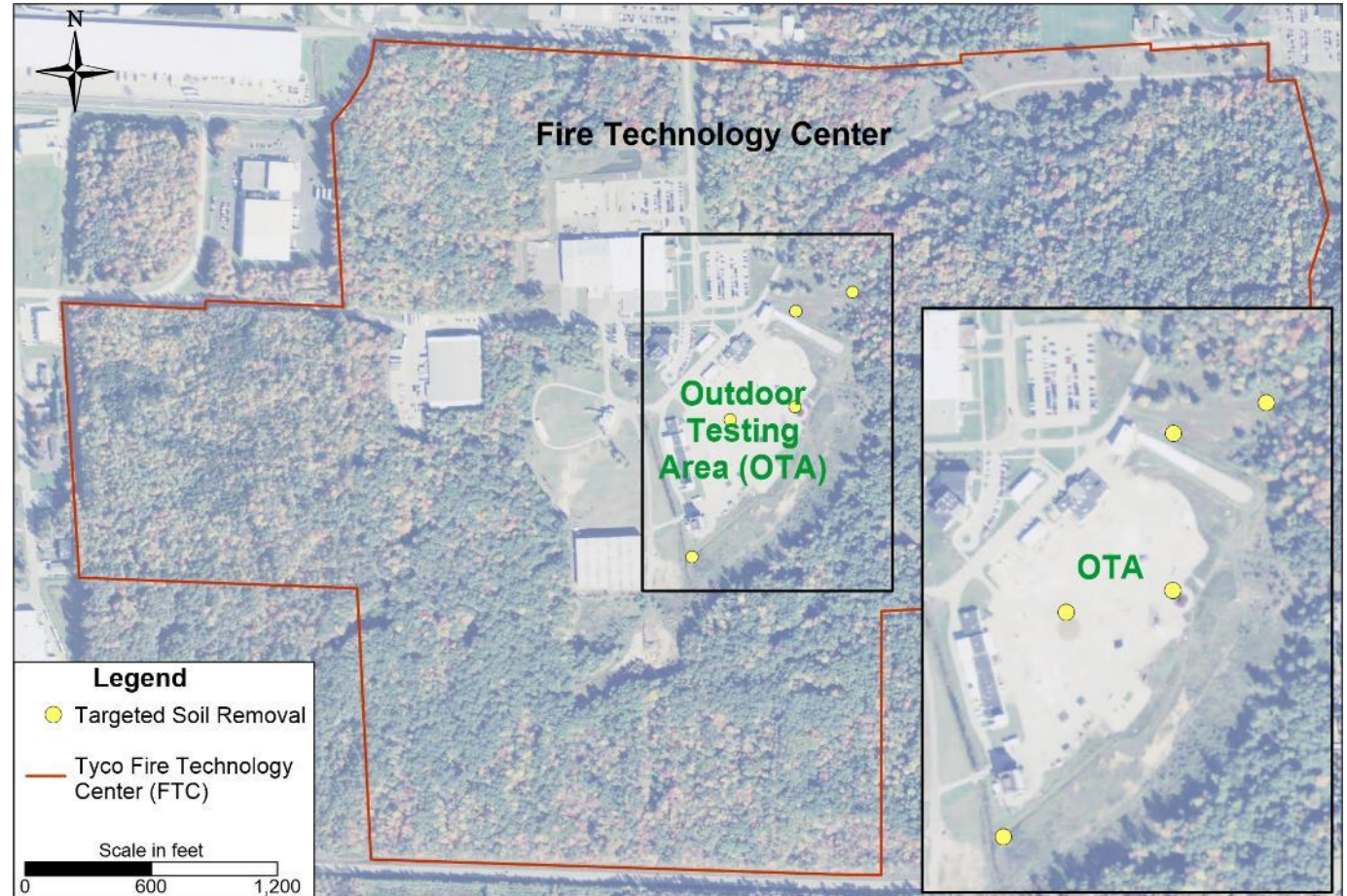
- All stored soils & soils with aggregated PFAS will be removed and disposed at an out-of-state permitted facility.
- **Phase 1:** Removal of stored soil from construction began June 11 & will take 4 months to complete
 - Soil loaded into rail container on truck and covered
 - Truck transports soil from FTC to rail yard
 - Soil loaded onto rail cars where it is taken out of state for removal at permitted facility.



Soil Extraction & Removal

Phase 2:

- Excavation of soil with aggregated PFAS at 5 locations in Outdoor Testing Area of FTC will begin after removal of stored soils
- DNR approved our Soil Remediation RADR on June 17, 2021.



Questions & Feedback

