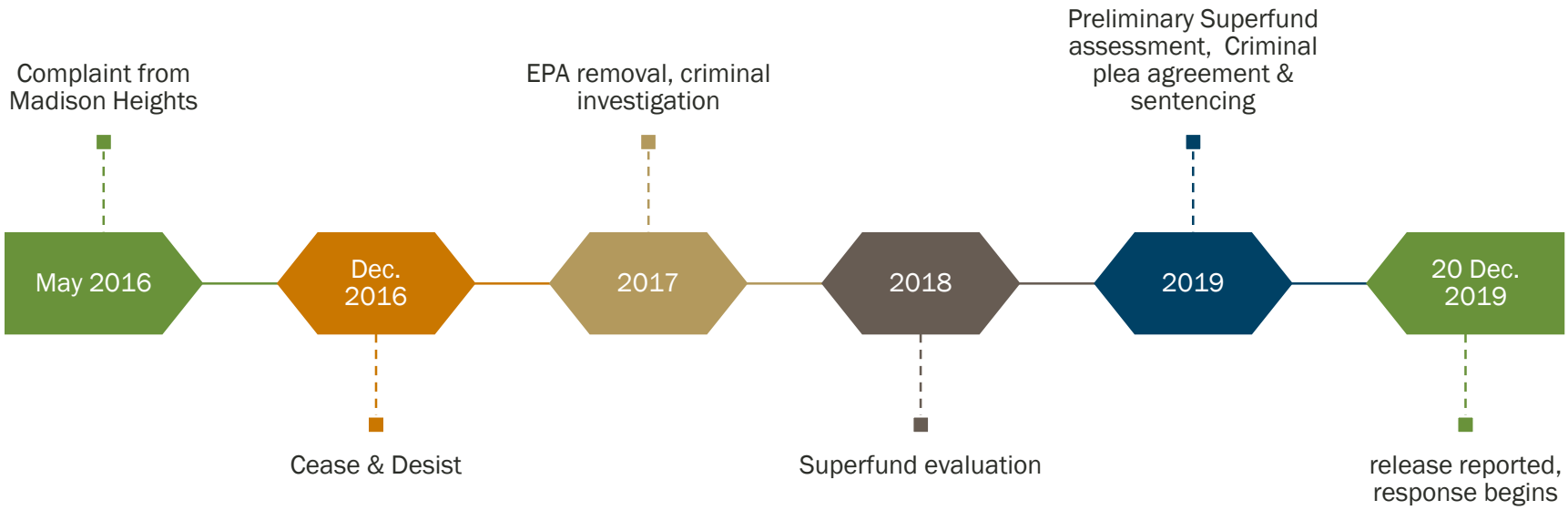
January 2020

Electro Plating Services Site, Madison Heights, Michigan

OSC Tricia Edwards

TIMELINE
EGLE & EPA COLLABORATION



Before EPA Removal

Electro-Plating Service Time Critical Removal 2017



Before 2017 EPA Removal

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
EPA
EMERGENCY RESPONSE

After EPA Removal

Electro-Plating Services I-696 Incident

December 20, 2019

Initial Response on December 20

Removal of contaminated Ice on embankment wall

Installation of Basement Sump

Embankment Sump

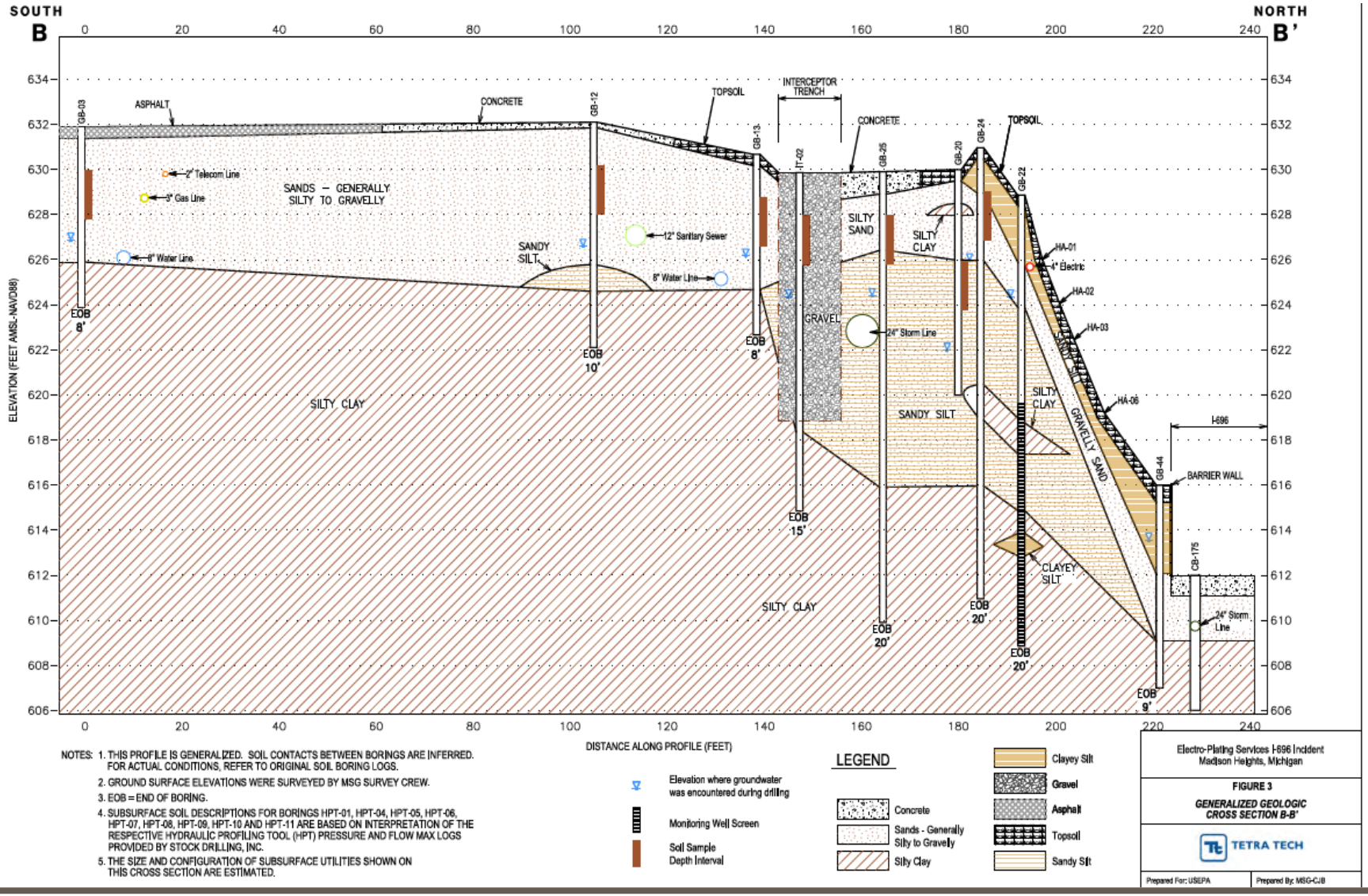
- I-696 Barrier Wall

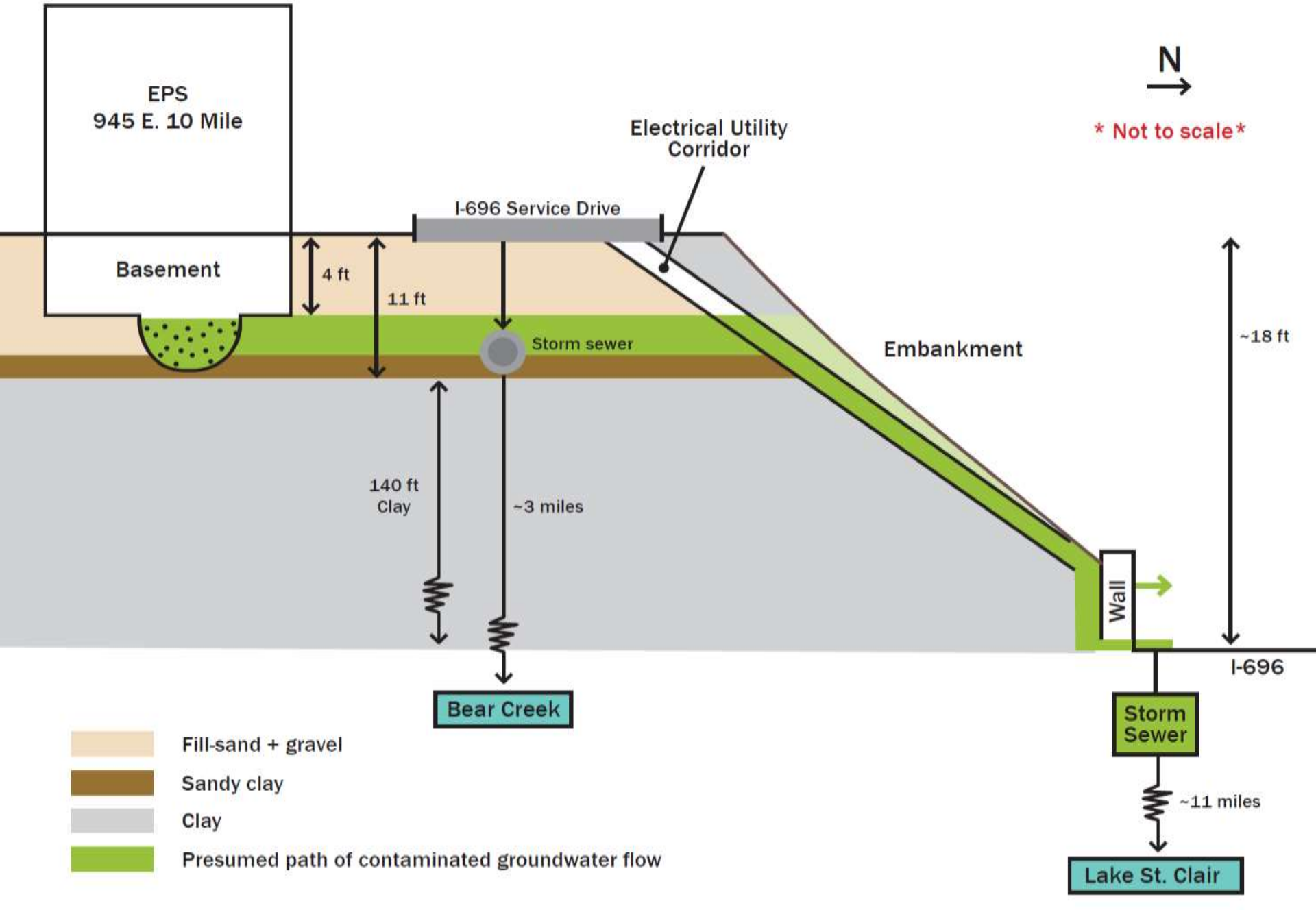
EPA Site Goals

- Protect Human health and the environment
- Control the surface discharge of Hazardous substance
- Stabilize the site
- Chose and Implement the most feasible treatment/clean up option available
- Return the site to EGLE for long-term remediation

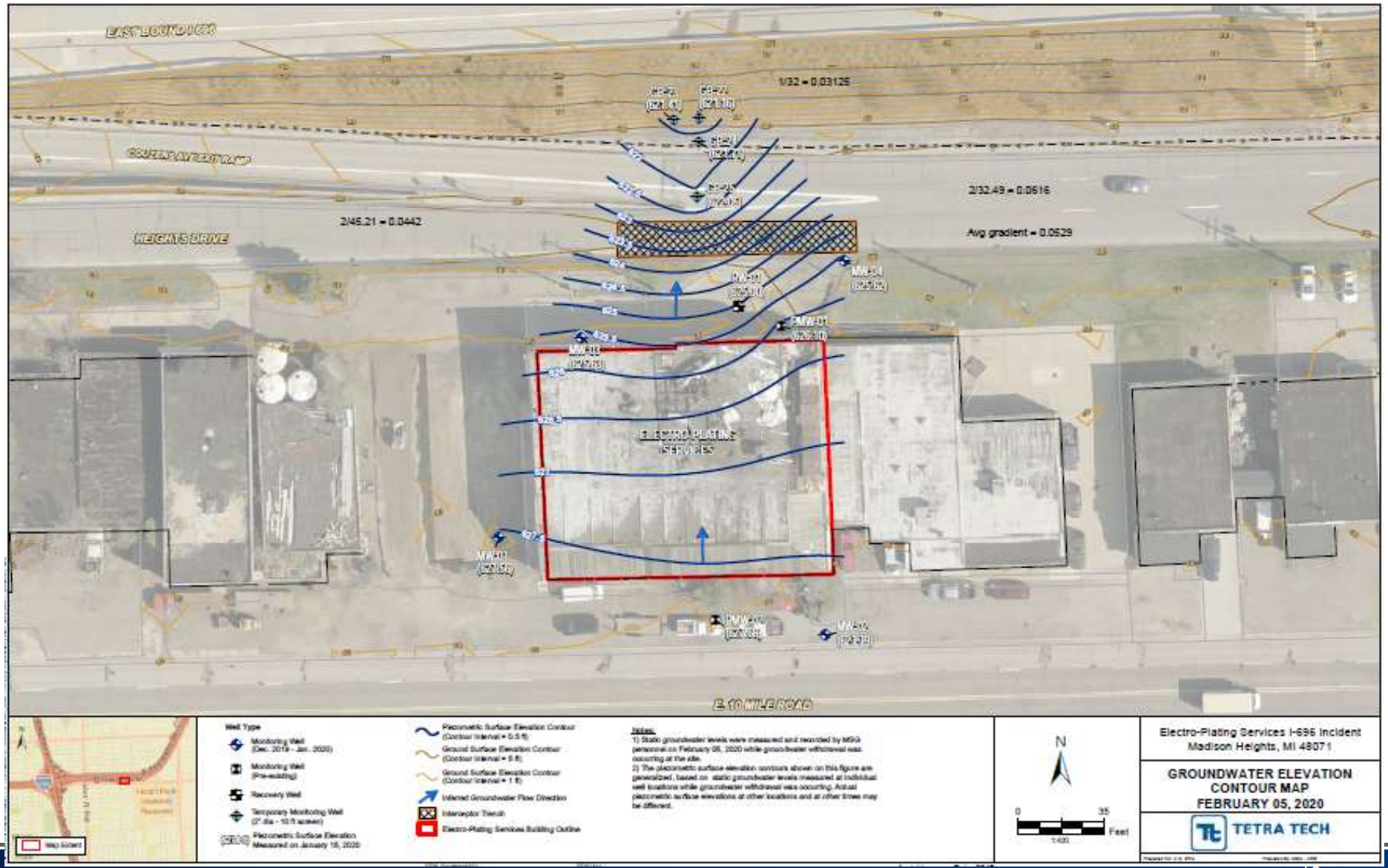
Site Investigation

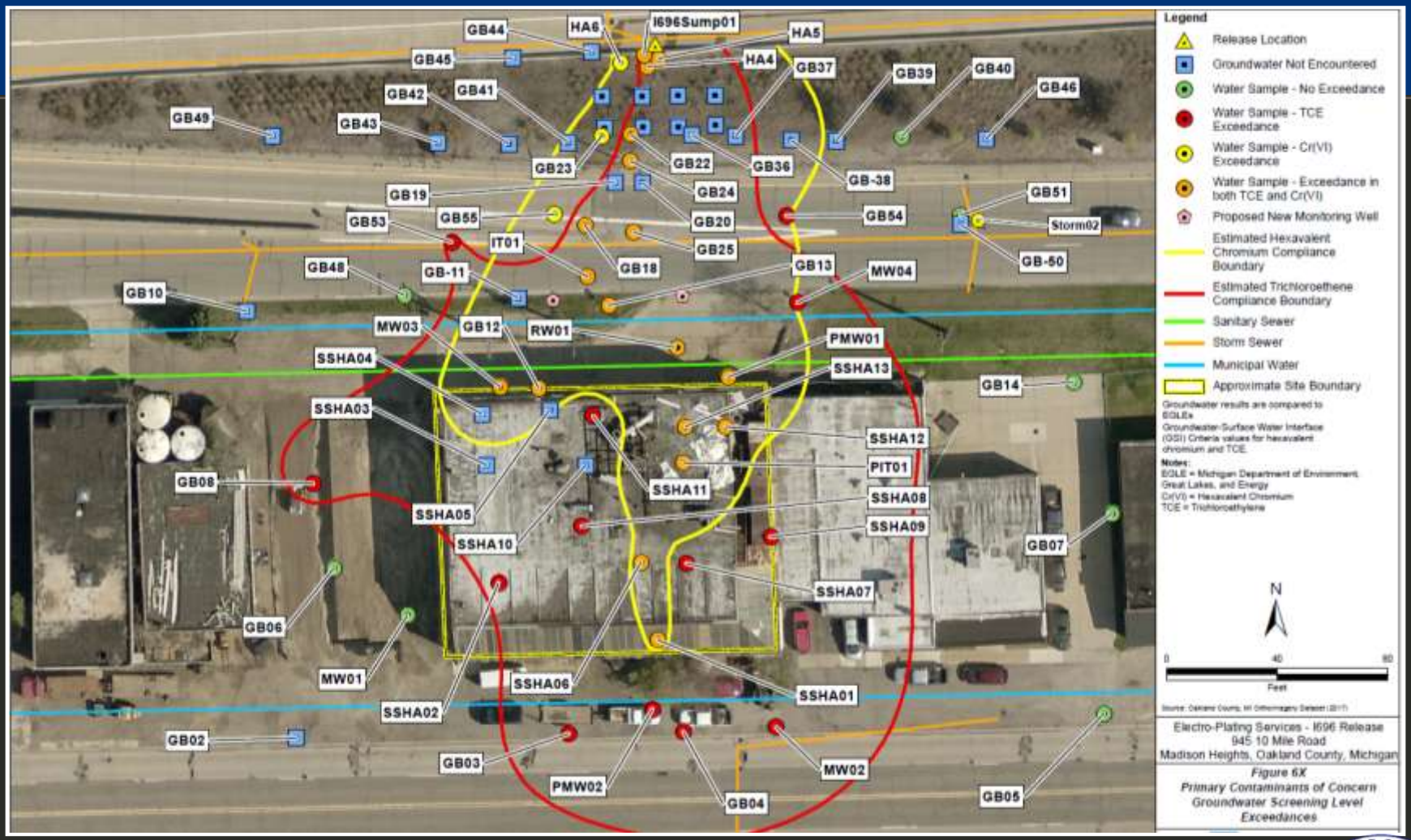
Elevation Profile – Cross Section




EPS
945 E. 10 Mile
Basement
4 ft
11 ft
I-696 Service Drive
Electrical Utility
Corridor
Storm sewer
Embankment
N
* Not to scale*
~18 ft
140 ft
Clay
~3 miles
Wall
I-696
Bear Creek
Storm
Sewer
~11 miles
Lake St. Clair
Fill-sand + gravel
Sandy clay
Clay
Presumed path of contaminated groundwater flow

Groundwater Flow





Site Investigation

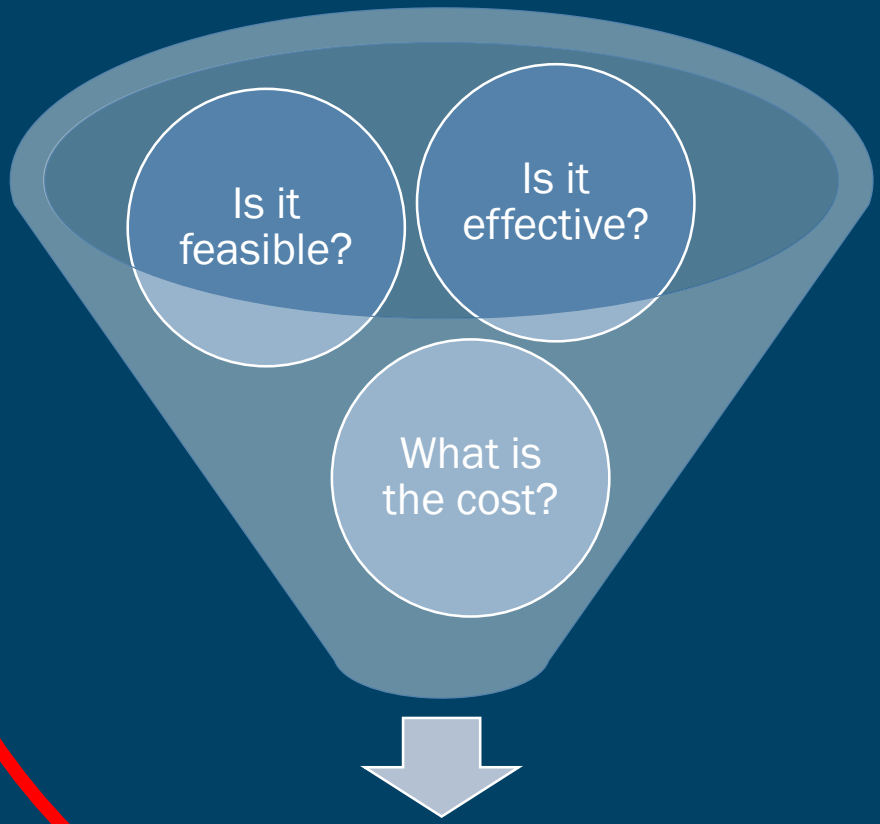
Response Actions

Interceptor Trench

Bypass System – Storm Sewer

EPA looked at a variety of technologies including:

- In-Situ (in-place) Treatment
- Groundwater collection and Conveyance
- Wastewater Treatment System
- Excavation/Containment
- A combination of more than one technology
- No further action



A total of 9 options were looked at before choosing In-Situ Treatment

What is In-Situ Treatment?

- In-situ treatment is the treatment of contamination in location where it is found in the environment, without removing the soil or groundwater from its location.
- Because the contaminated media (soil, groundwater, etc.) is treated In-Situ, the amount of waste produced is significantly reduced.
- This method is especially helpful when cleaning up high levels in levels of contamination.

Why did we choose In-Situ Treatment?

- Treatment of the Chemicals of Concern
  - Hexavalent Chromium
  - Trichloroethylene (TCE)
  - Cyanide
- Reduction of PFAS/PFOS
- Long Term benefits
- Readily Implementable
- Cost Effective
  - Implementation
  - Operations & Maintenance (O&M)

How to Implement In-Situ Treatment

Permeable Reactive Barrier

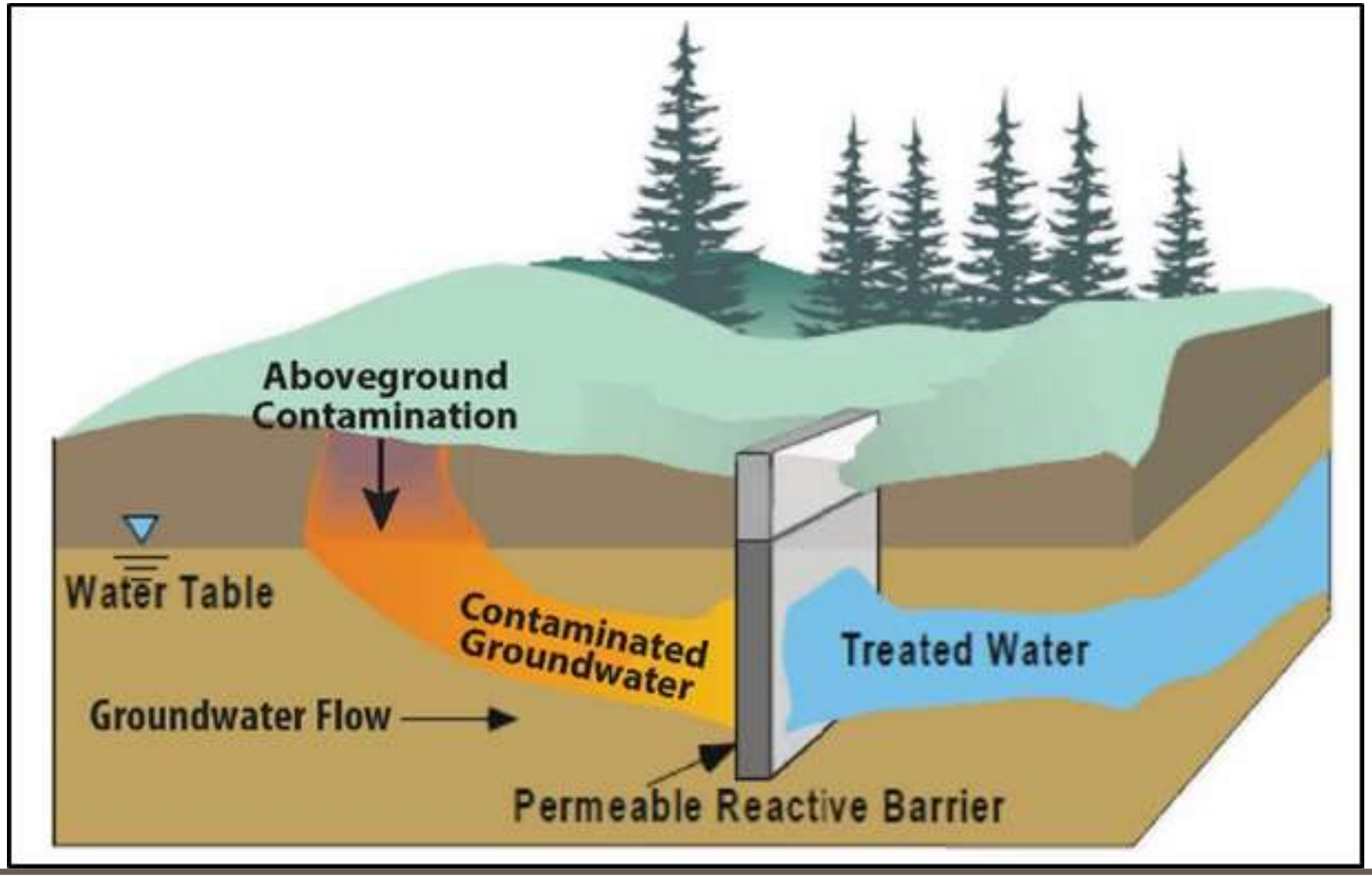
- A permeable reactive barrier (PRB) is an In-Situ treatment zone established within a contaminated groundwater unit through the application of reactive products.
- The reactive materials interact with the plume of contaminants as it passively migrates through the PRB, removing or degrading contaminants with treated groundwater migrating out of the PRB.
- The primary removal mechanisms include:

  (1) sorption and precipitation,

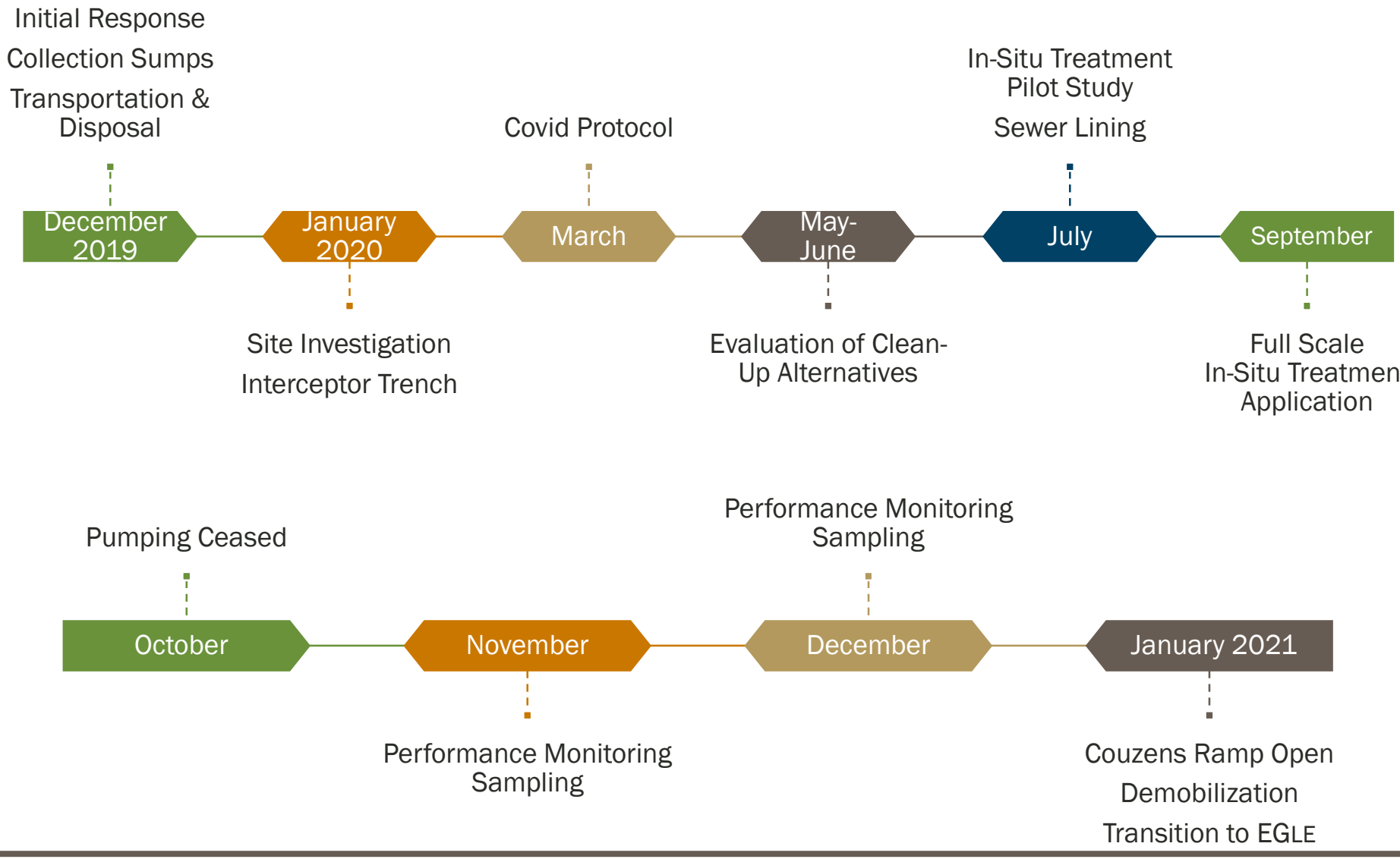
  (2) chemical reaction, and

  (3) biological oxidation or reduction, depending on the target contaminants.

Conceptual Example Design



Timeline of Site Operations



Disposal Metrics (10/2020)

	Volume (Gallons)
Total Liquid Currently On-Site	0
Total Liquid Taken Off-Site for Disposal	353,878
- D007 / PFOS	293,959
- Nonhazardous / PFOS	59,919

Continued Operations and Additional Actions

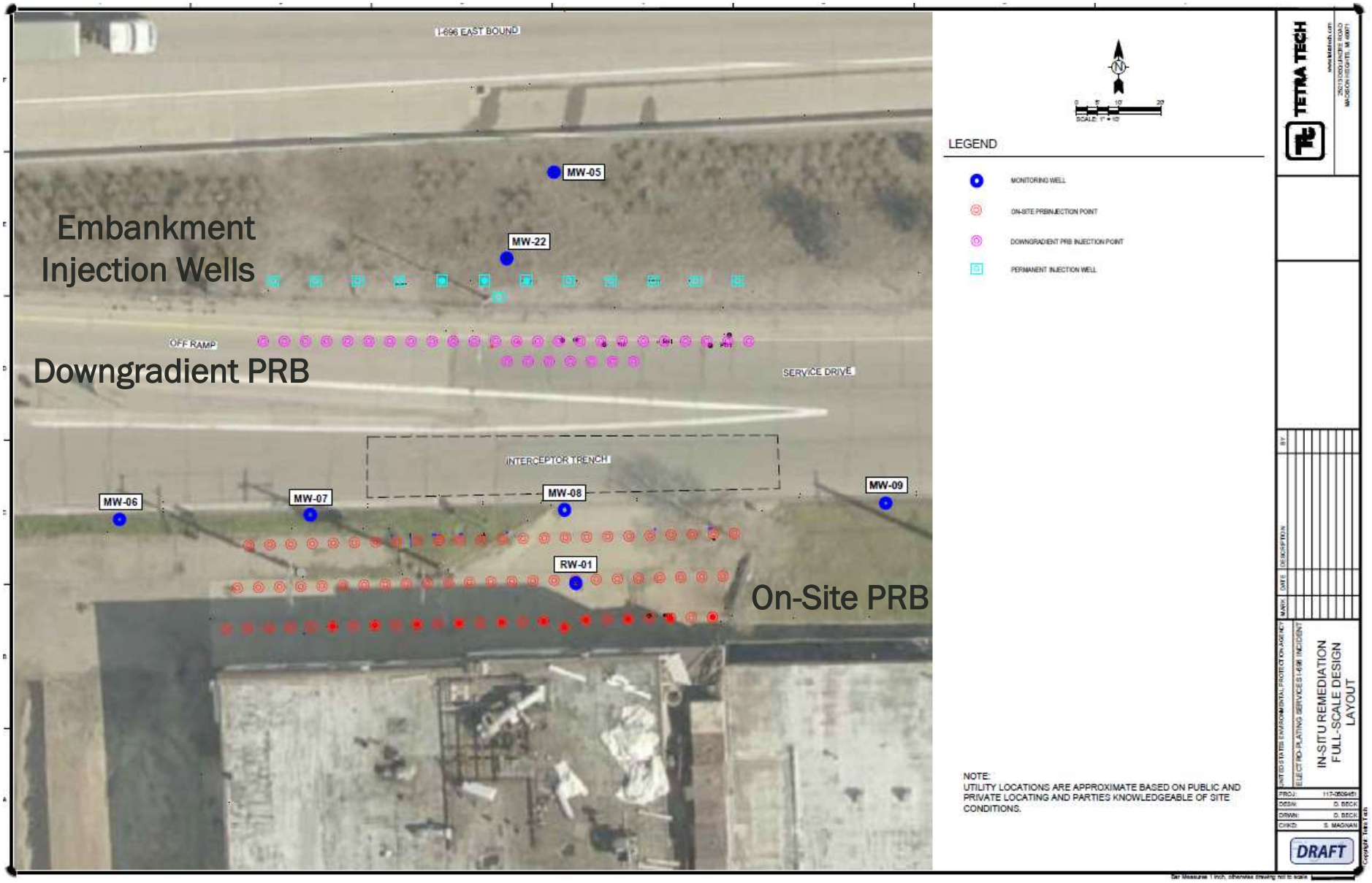
- Lining of Sanitary & Storm Sewers – Cured In Place Pipe
  - Repair damaged underground wastewater and stormwater sewer pipes without excavation
  - Repair 1 manhole


MADISON HEIGHTS 10 MILE
1659 -> 1658
Circular 12inch Vitrified Clay Pip
204.90


MADISON HEIGHTS 10 MILE
1659 -> 1658
Circular 12inch Reinforced Concret
204.70

Manhole Rehabilitation

IN-SITU TREATMENT


I-696 EAST BOUND
MW-05
MW-22
Embankment
Injection Wells
OFF RAMP
Downgradient PRB
SERVICE DRIVE
INTERCEPTOR TRENCH
MW-06
MW-07
MW-08
MW-09
RW-01
On-Site PRB
LEGEND
MONITORING WELL
ON-SITE PRB INJECTION POINT
DOWNGRADIENT PRB INJECTION POINT
PERMANENT INJECTION WELL
NOTE:
UTILITY LOCATIONS ARE APPROXIMATE BASED ON PUBLIC AND PRIVATE LOCATING AND PARTIES KNOWLEDGEABLE OF SITE CONDITIONS.
TETRA TECH
IN-SITU REMEDIATION
FULL-SCALE DESIGN
LAYOUT
DRAFT


Embankment Wells
Downgradient PRB
On-Site PRB
STOP

On-Site PRB

- 72 Injection Points
- 5 – 9 feet bgs
- 150 – 200 psi; typ. 175 psi
- Completed Application:
  - EHC Plus
  - Metafix

Basement Sump Application

- 1 Injection Points
- Completed Application:
  - ELS Microemulsion
  - Ferrous Sulfate

Downgradient PRB

- 28 Injection Points
- 5 – 11 feet bgs
- Completed Application
  - EHC Plus

Downgradient PRB

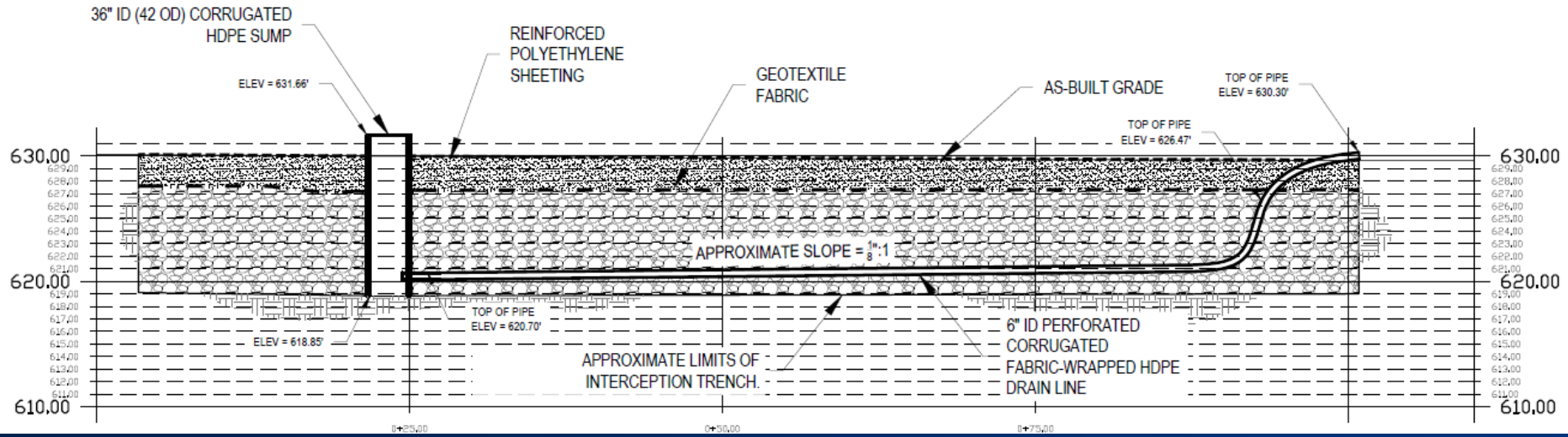
Embankment Injection Wells

- 10 New, 2 PT Injection Wells
- Screened 6 – 16 feet bgs
- 170 psi
- Completed Application
  - ELS Concentrate
  - GeoForm Soluble

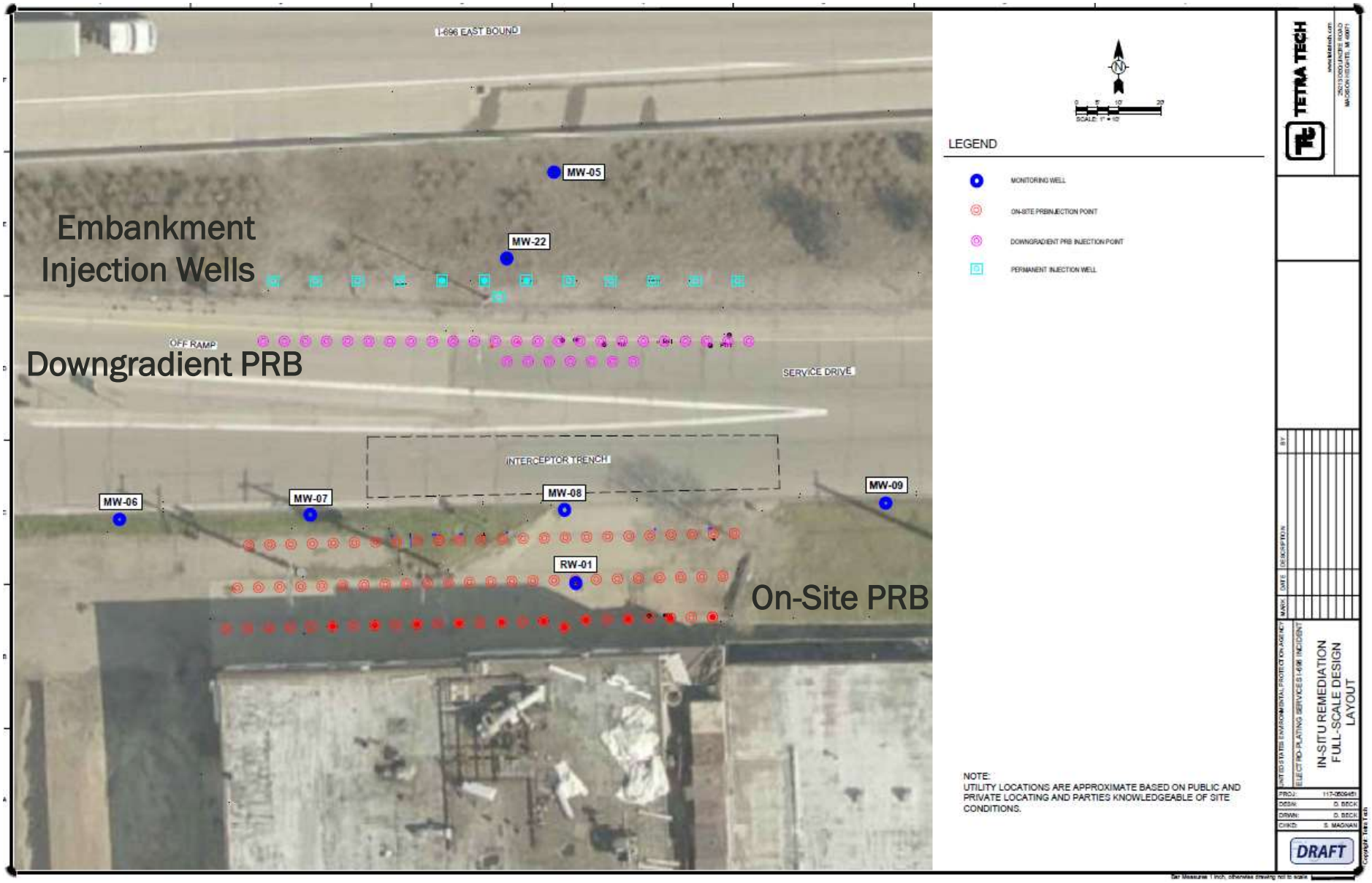
Embankment Injection Wells

Interceptor Trench Application

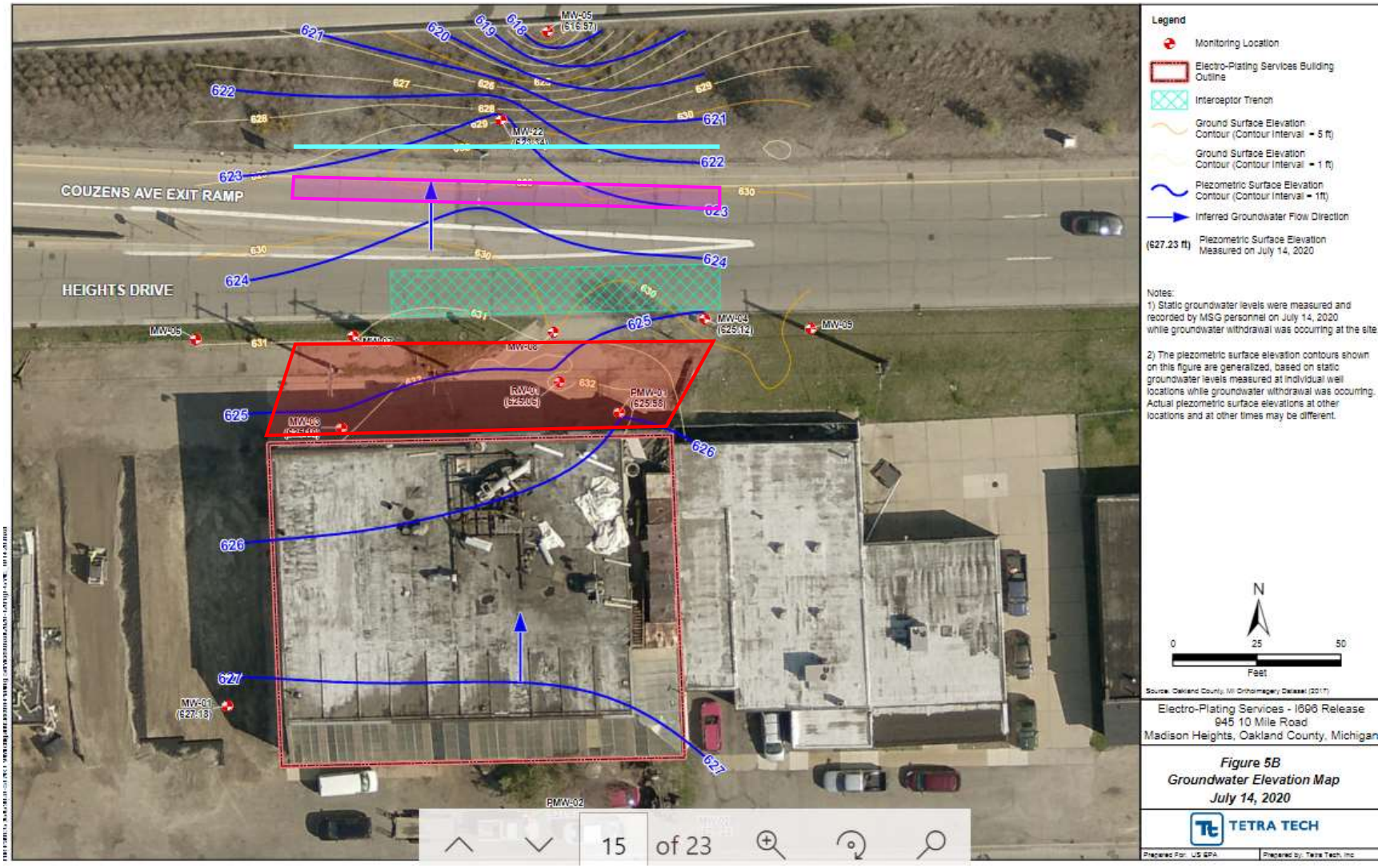
- Completed Application
  - 615 gal total volume
  - 105 lbs ELS Concentrate
  - 262 lbs GeoForm Soluble



In-Situ / Monitoring Well Points

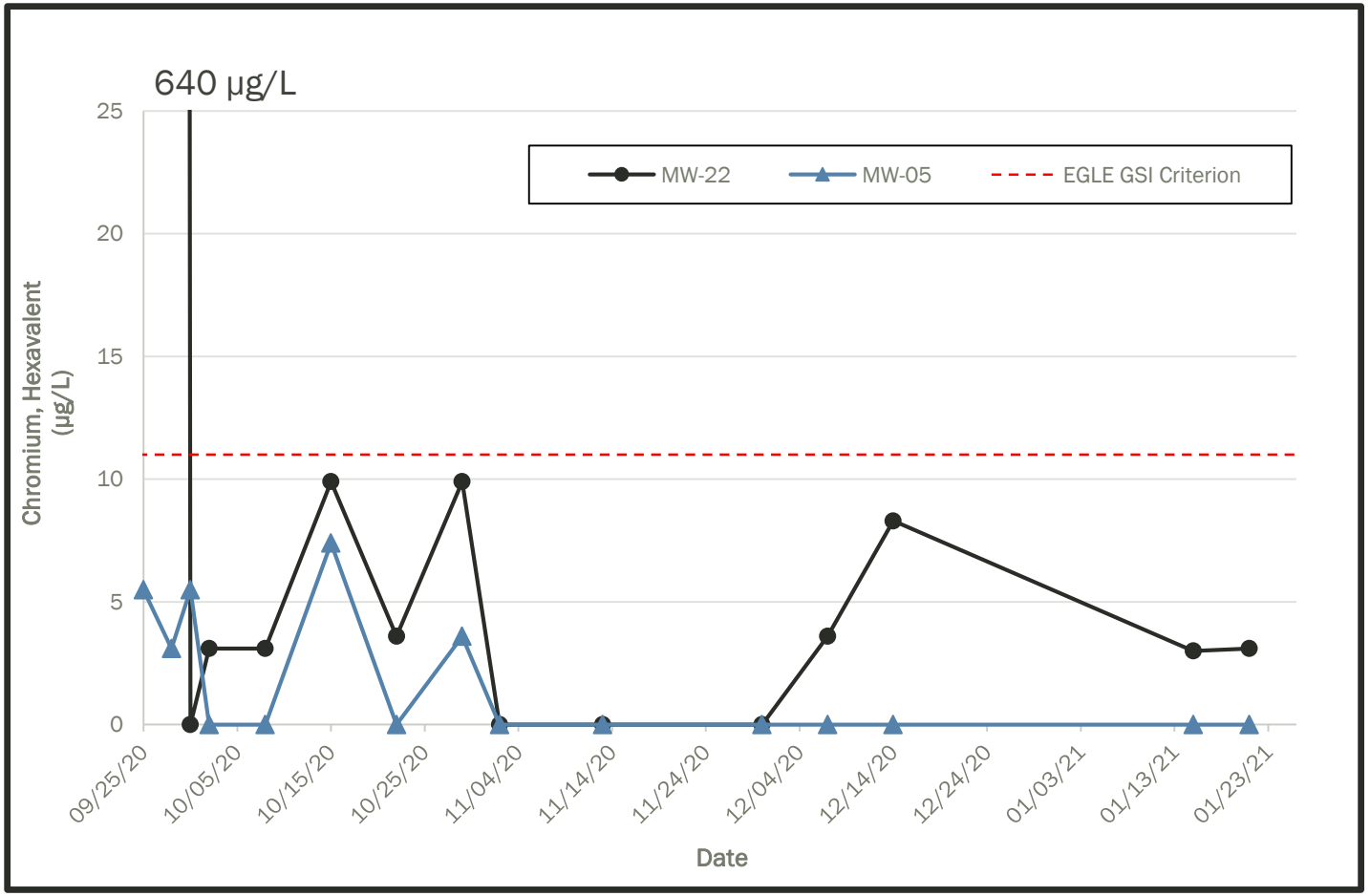


Groundwater Flow



Weekly Monitoring at Embankment

Date	Chromium, Hexavalent (µg/L)	
	MW-22	MW-05
07/21/20	31,000	--
07/27/20	28,000	--
09/25/20	11,000	5.5
09/28/20	640	3.1
09/30/20	ND	5.5
10/02/20	3.1	ND
10/08/20	3.1	ND
10/15/20	9.9	7.4
10/22/20	3.6	ND
10/29/20	9.9	3.6
11/02/20	ND	ND
11/13/20	ND	ND
11/30/20	ND	ND
12/07/20	3.6	ND
12/14/20	8.3	ND
01/15/21	3.0	ND
01/21/21	3.1	ND



EGLE Groundwater Surface Water Interface Criteria – 11 µg/L

Post-Treatment Groundwater Analyses – Performance Monitoring Sampling

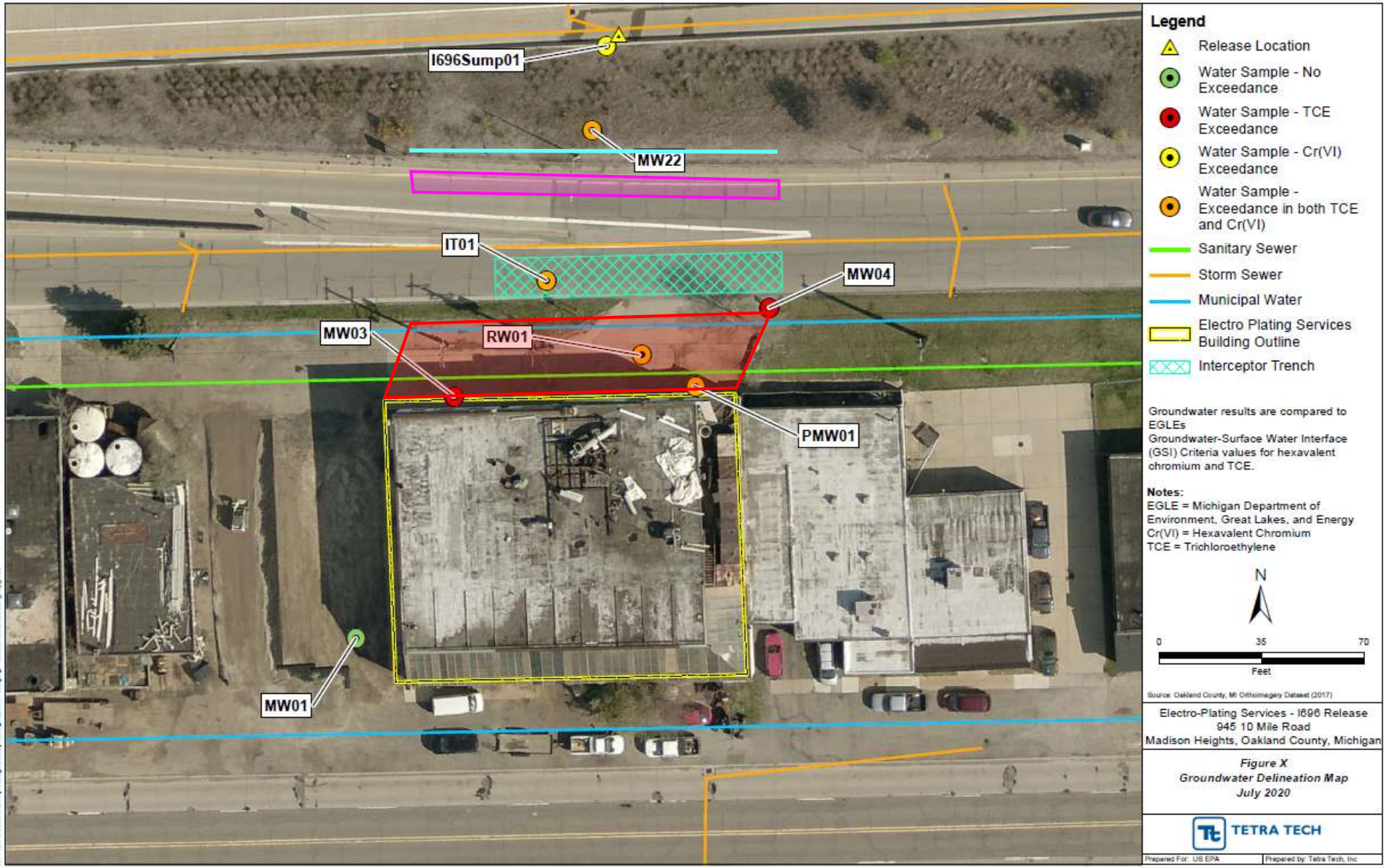
Site Contaminants

- Cyanide (Total, Available)
- Hexavalent Chromium
- Metals (TAL + Hg, Dissolved)
- PFAS
- VOCs

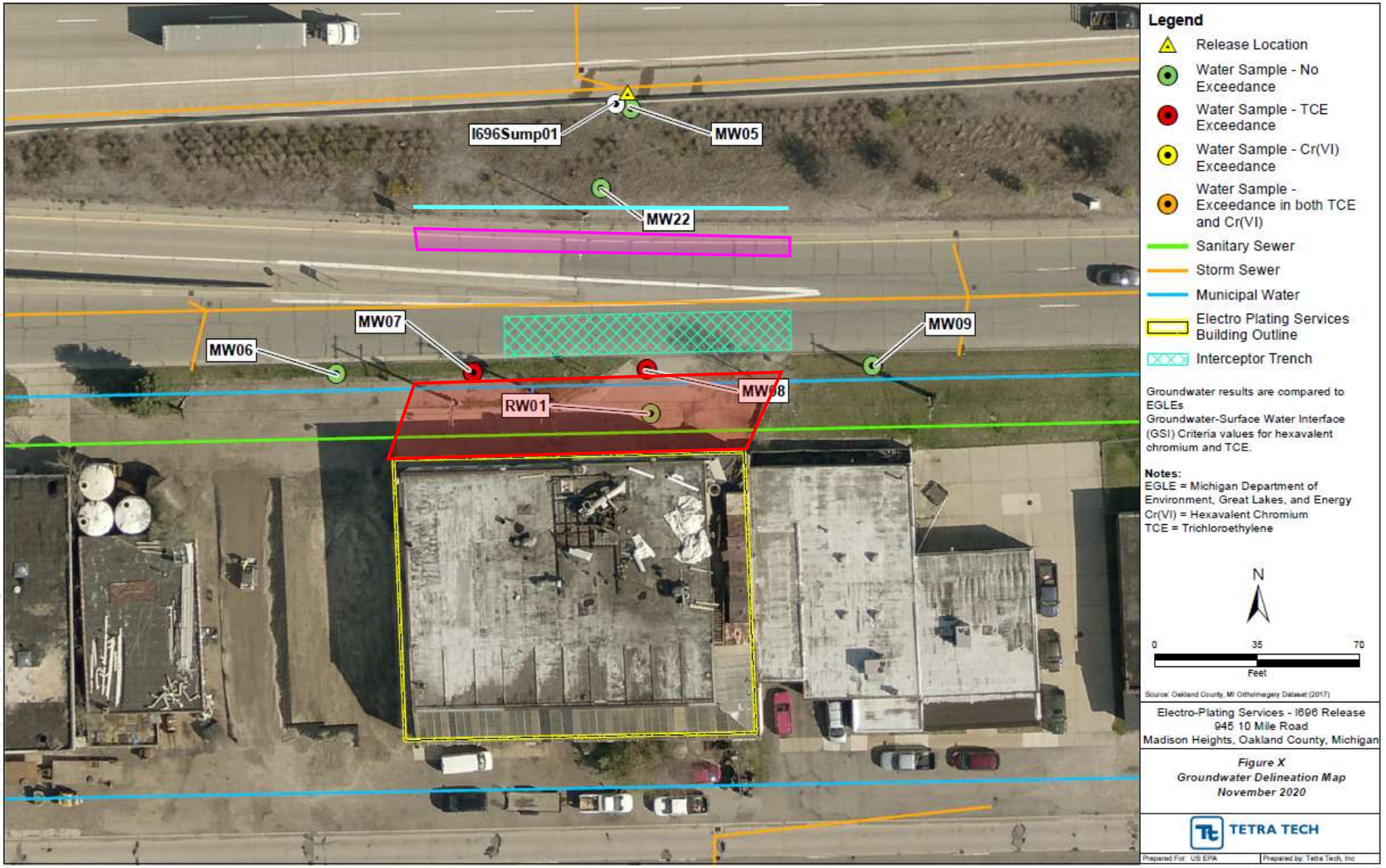
Performance Parameters

- Anions (Nitrate, Sulfate, Chloride)
- Dissolved Gases (Ethane, Ethene, Methane)
- Total Organic Carbon

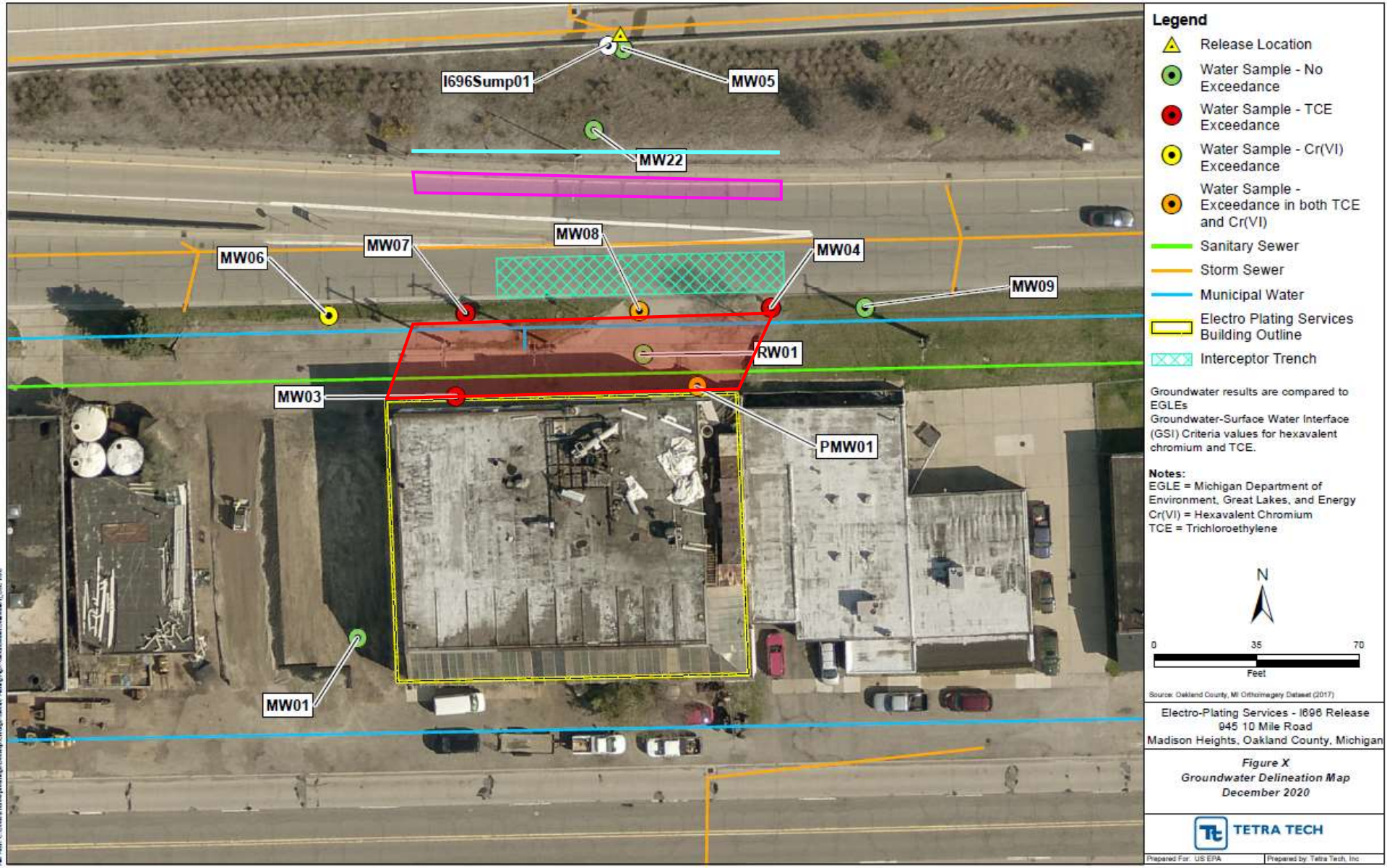
1st Round of Sampling: COMPLETED 11/02/2020
2nd Round of Sampling: COMPLETED 12/15/2020


I696Sump01
MW22
IT01
MW04
MW03
RW01
PMW01
MW01
Legend
Release Location
Water Sample - No Exceedance
Water Sample - TCE Exceedance
Water Sample - Cr(VI) Exceedance
Water Sample - Exceedance in both TCE and Cr(VI)
Sanitary Sewer
Storm Sewer
Municipal Water
Electro Plating Services Building Outline
Interceptor Trench
Groundwater results are compared to EGLEs Groundwater-Surface Water Interface (GSI) Criteria values for hexavalent chromium and TCE.
Notes:
EGLE = Michigan Department of Environment, Great Lakes, and Energy
Cr(VI) = Hexavalent Chromium
TCE = Trichloroethylene
N
0
35
70
Feet
Source: Oakland County, MI Orthoimagery Dataset (2017)
Electro-Plating Services - I696 Release
945 10 Mile Road
Madison Heights, Oakland County, Michigan
Figure X
Groundwater Delineation Map
July 2020
TETRA TECH
Prepared For: US EPA
Prepared by: Tetra Tech, Inc

July 2020



November 2020



December 2020

I-696 to Couzens Exit Ramp Open

Basement Sump

I-696 Embankment Wall


2020
Interceptor Trench Sump
2021

EPA Transition to EGLE

- Source Contamination remains in place
- EPA-EGLE agreement of Interim Clean up plan
  - In-Situ Treatment and
  - On-going Operations & Maintenance.
- Excluding the work to be completed in the Spring, the Site is now under EGLE's Remediation and Redevelopment (RRD) Division

Schedule of Remaining Site Activities:

ESTIMATED TIMELINE	DESCRIPTION
January	Service Drive (CLOSED) / Demobilization of EPA / Transfer Site to EGLE
Spring 2021 (EPA)	Remove I-696 Sump / Restore*
	Remove Interceptor Trench / Restore Service Drive*

*Weather dependent / Subject to change

INFORMATION UPDATES

- EPA - Website
  - https://www.epa.gov/mi/electro-plating-services-i696-release-site

- EGLE - Website
  - https://www.michigan.gov/egle/0,9429,7-135-3312_4118-515339--,00.html

- FAQ: https://www.michigan.gov/documents/egle/egle-eps-faq_675035_7.pdf