

# Abex Aerospace Site The Road to NFA

Michigan Department of Environmental  
Quality

Jeff Spruit, DEQ and Chriso Petropoulou, Geosyntec

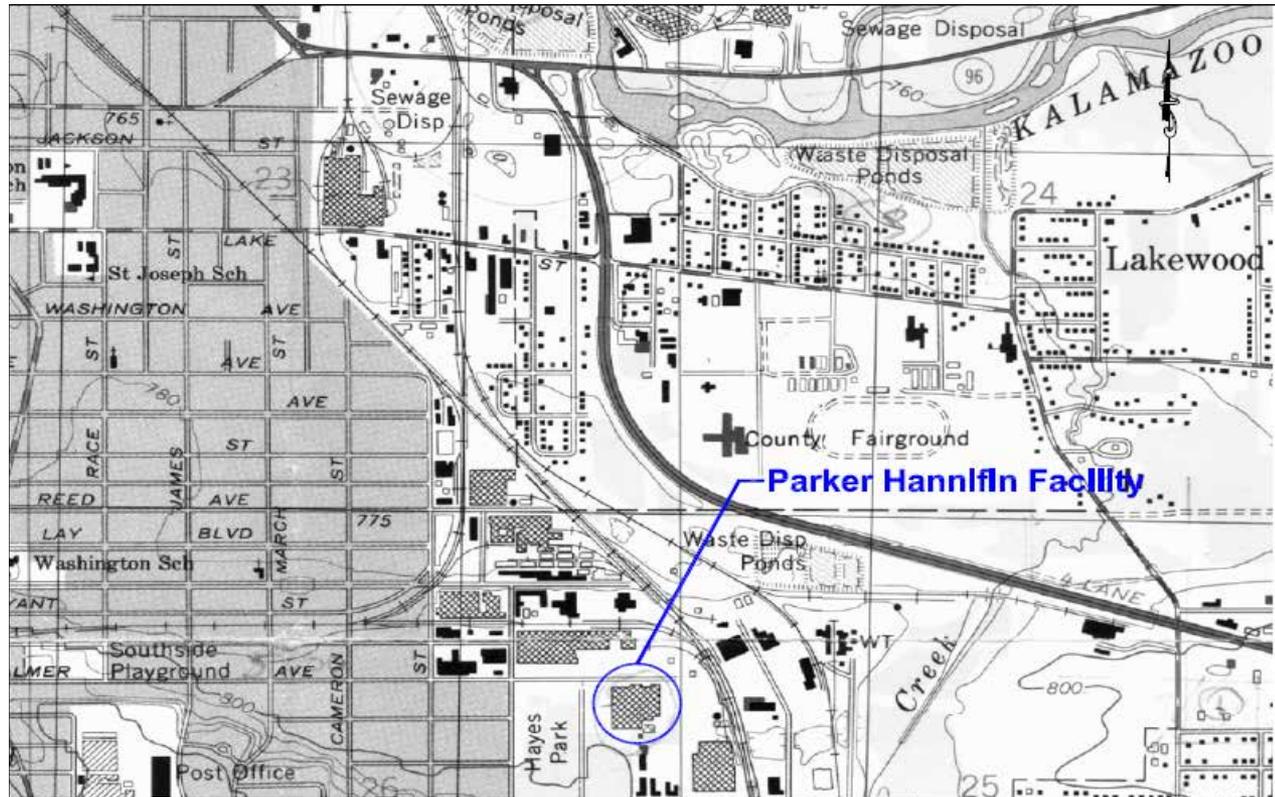
269-567-3520 / [spruitj@michigan.gov](mailto:spruitj@michigan.gov)

312-658-0500 / [Cpetropoulou@Geosyntec.com](mailto:Cpetropoulou@Geosyntec.com)

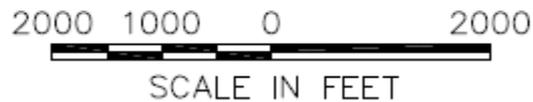
# Outline

- Background
  - CSM
  - Collaborative Efforts
- Solution(s)
  - Statute Provisions
  - Amendments
- Outcome(s)

# Background



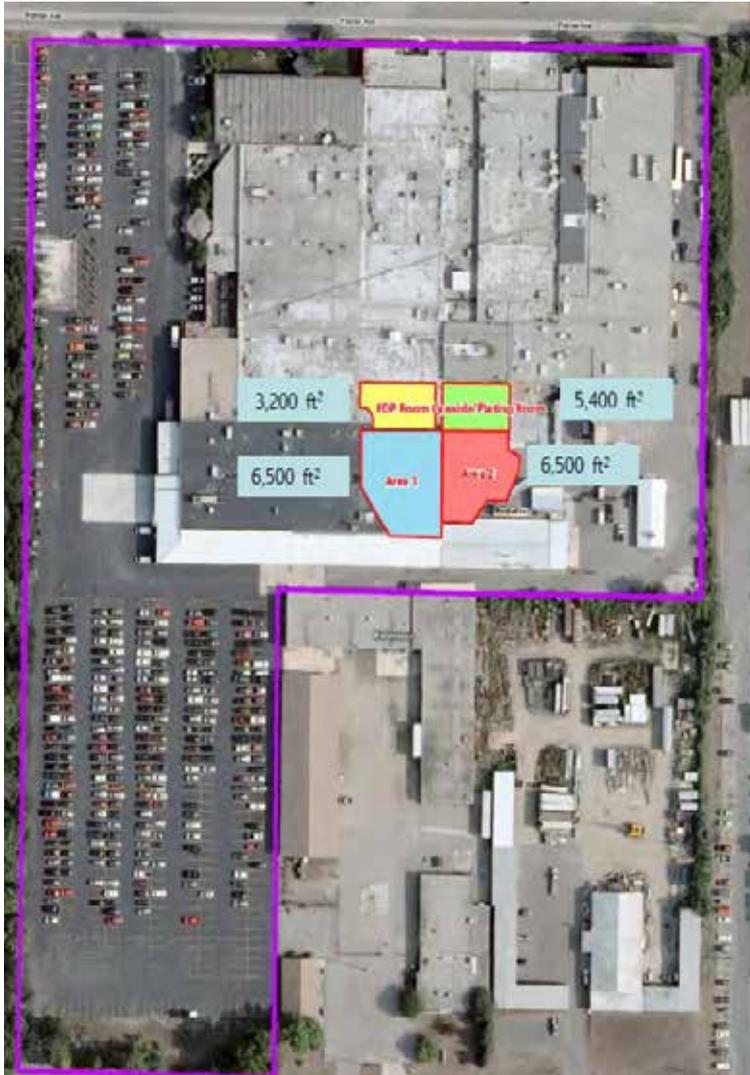
**SITE LOCATION MAP  
PARKER HANNIFIN FACILITY  
KALAMAZOO, MICHIGAN**



Source: USGS 7.5 Minute Series, Kalamazoo, Michigan Quad



# Background



## Property Transactions

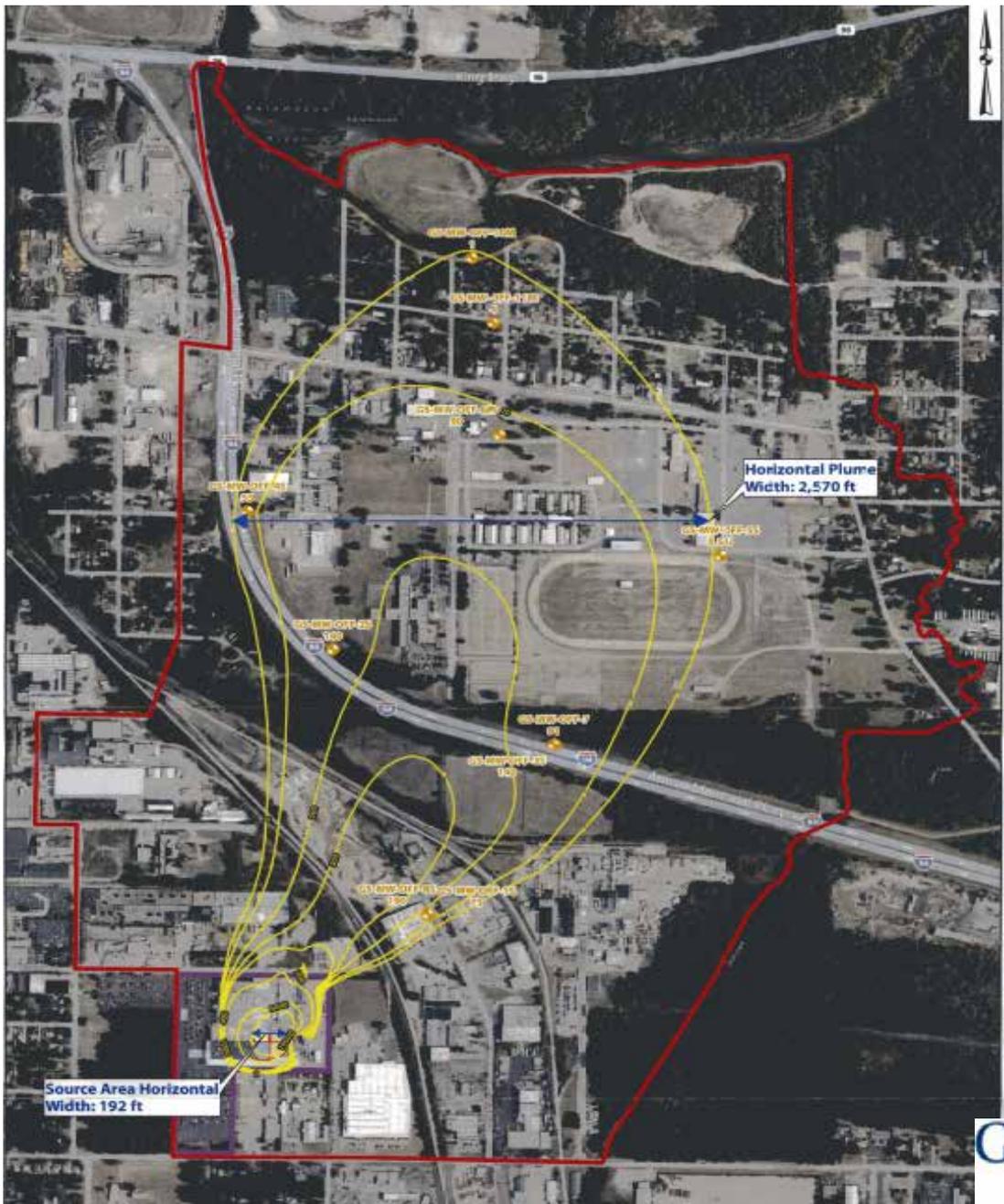
- 1948 – Active Manufacturing National Water Lift
- 1990s – Abex Sold to Parker Hannifin
- Late 1990s – Due Diligence

# Conceptual Site Model

- Geology
  - Glacial Outwash Sands
  - Glacio-Lacustrine Fine Sands & Clays
- Hydrology
  - Groundwater ~ 16 ft. bgs. On-site
  - Groundwater flows NNE
  - Kalamazoo River ~ 5600 ft. N of Property
- Geochemistry
  - Chlorinated Solvents, Daughters & Stabilizer
  - PAHs
  - Sources
    - Degreasing Stations
  - Sub-slab Soils
  - Sub-slab Groundwater
  - Off-site Groundwater
  - Plume
    - 5400 ft. x 2500 ft.
  - Relevant Pathways
    - Drinking Water
    - Vapor Intrusion
    - GSI

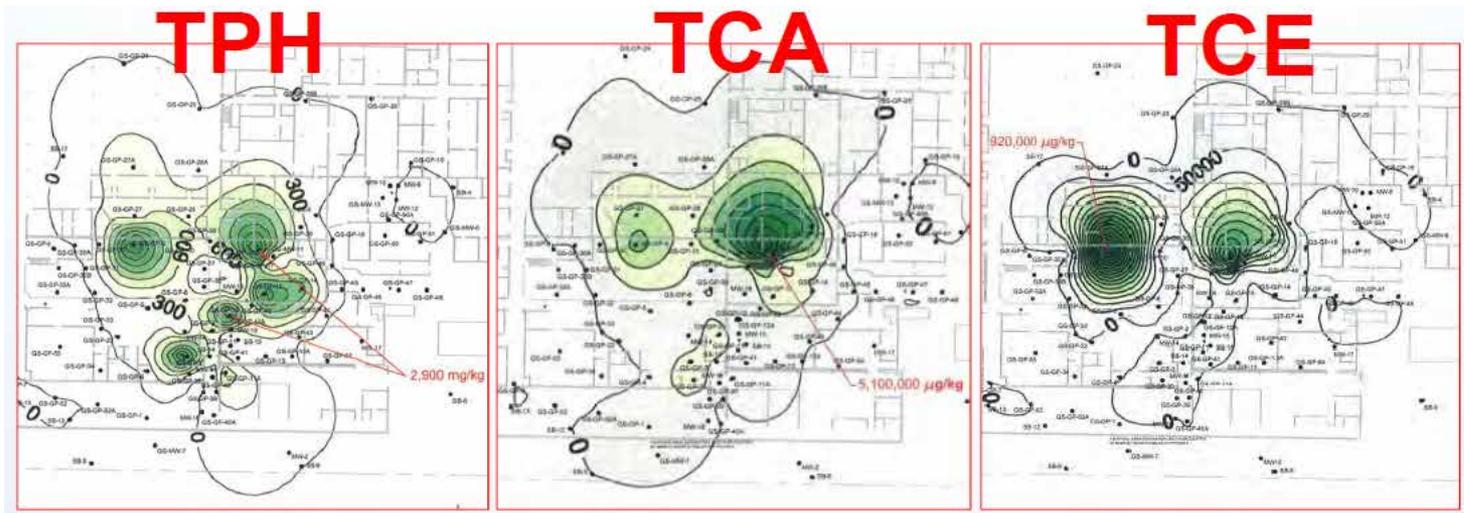


# Conceptual Site Model



# Contaminants of Concern

Petroleum hydrocarbons, TCA and TCE plumes co-located and overlapping



# Response Activities

- **Source Removals**
  - Areas 1 & 2
    - R/D 6420 T Soil/Debris; 290 T Hazardous
    - Enhanced Backfill
    - Foresight

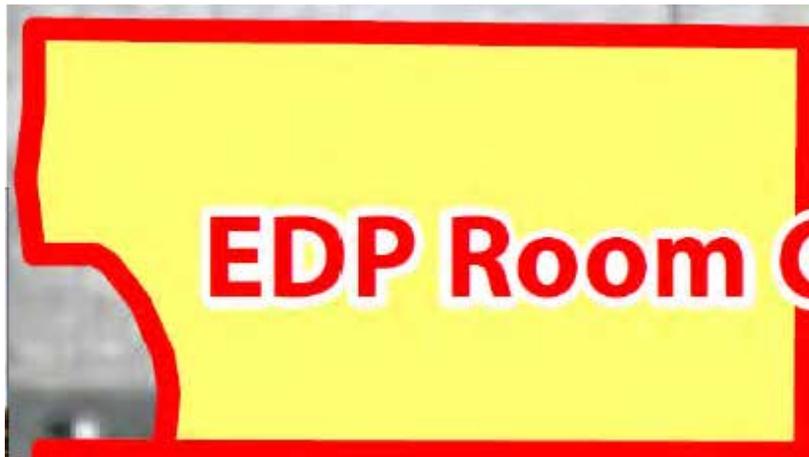


# Response Activities

- **Source Removals**

- EDP Room

- R/D 2862 T Soil/Debris; 496 T Hazardous
    - Enhanced Backfill
    - Foresight

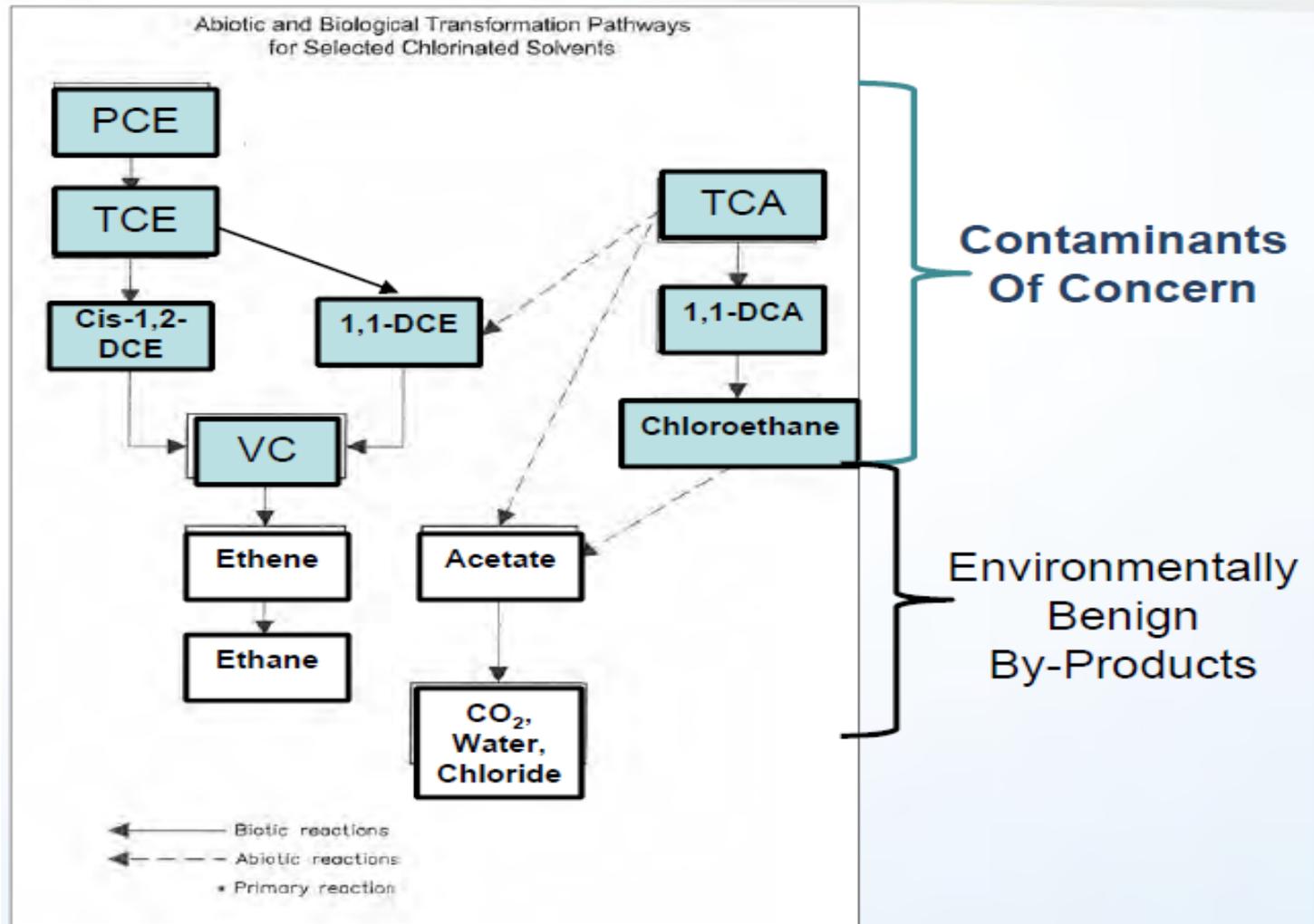


# Remedial Activities

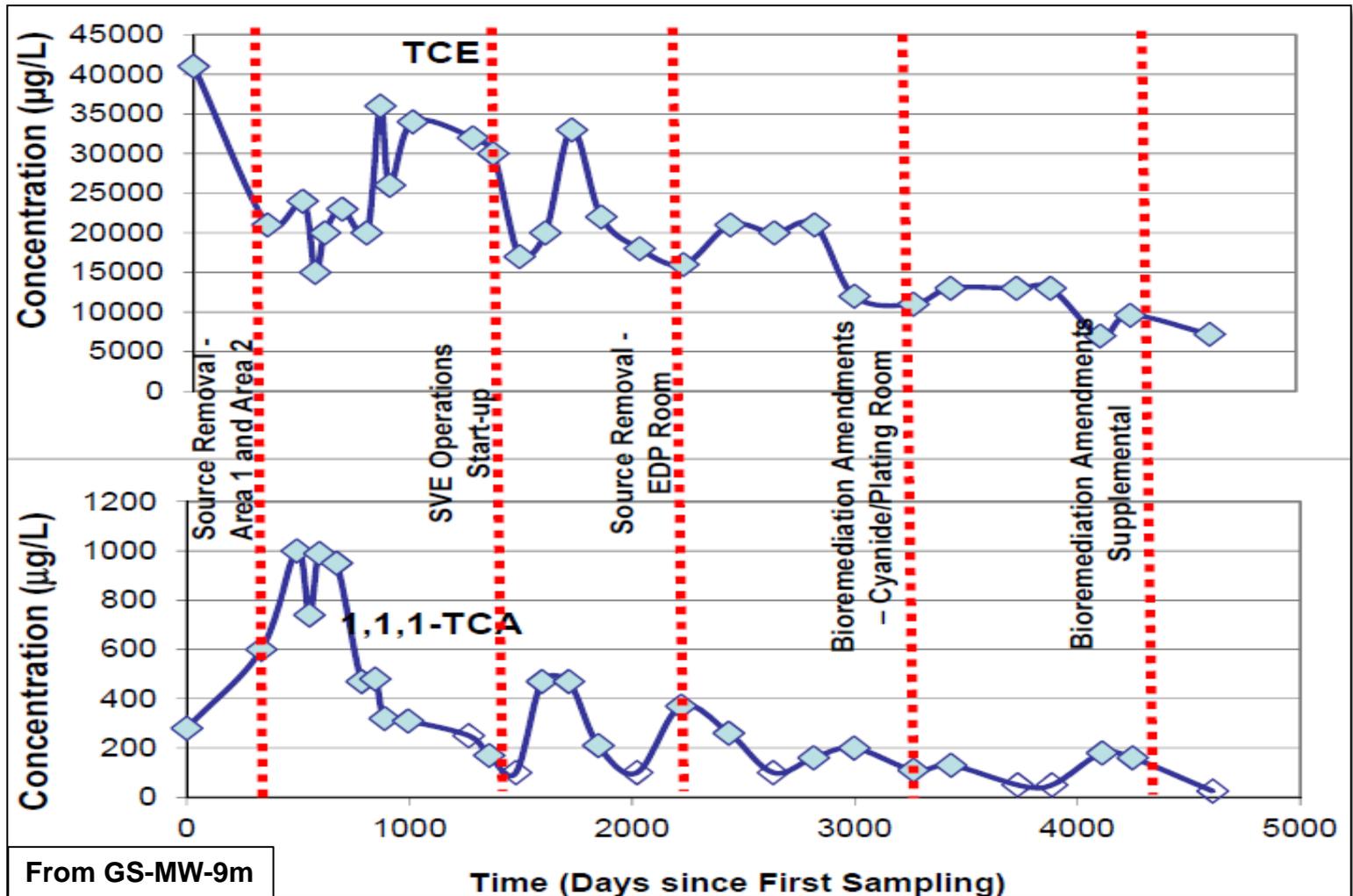
- **Source Control**
  - Cyanide/Plating Room
    - In Situ Bio-Augmentation – Soil & Groundwater
    - Micro-scale ZVI
    - EVO
    - KB-1® Plus



# Remedial Activities



# Remedial Activities' Effectiveness



# Relevant Pathways

- **Vapor Intrusion**
  - On-site
  - Off-site
- **Groundwater Surface Water Interface**
  - Storm Sewers
  - Kalamazoo River
- **Drinking Water**
  - **MANY** offsite residential & non-residential properties! **YIKES!!**

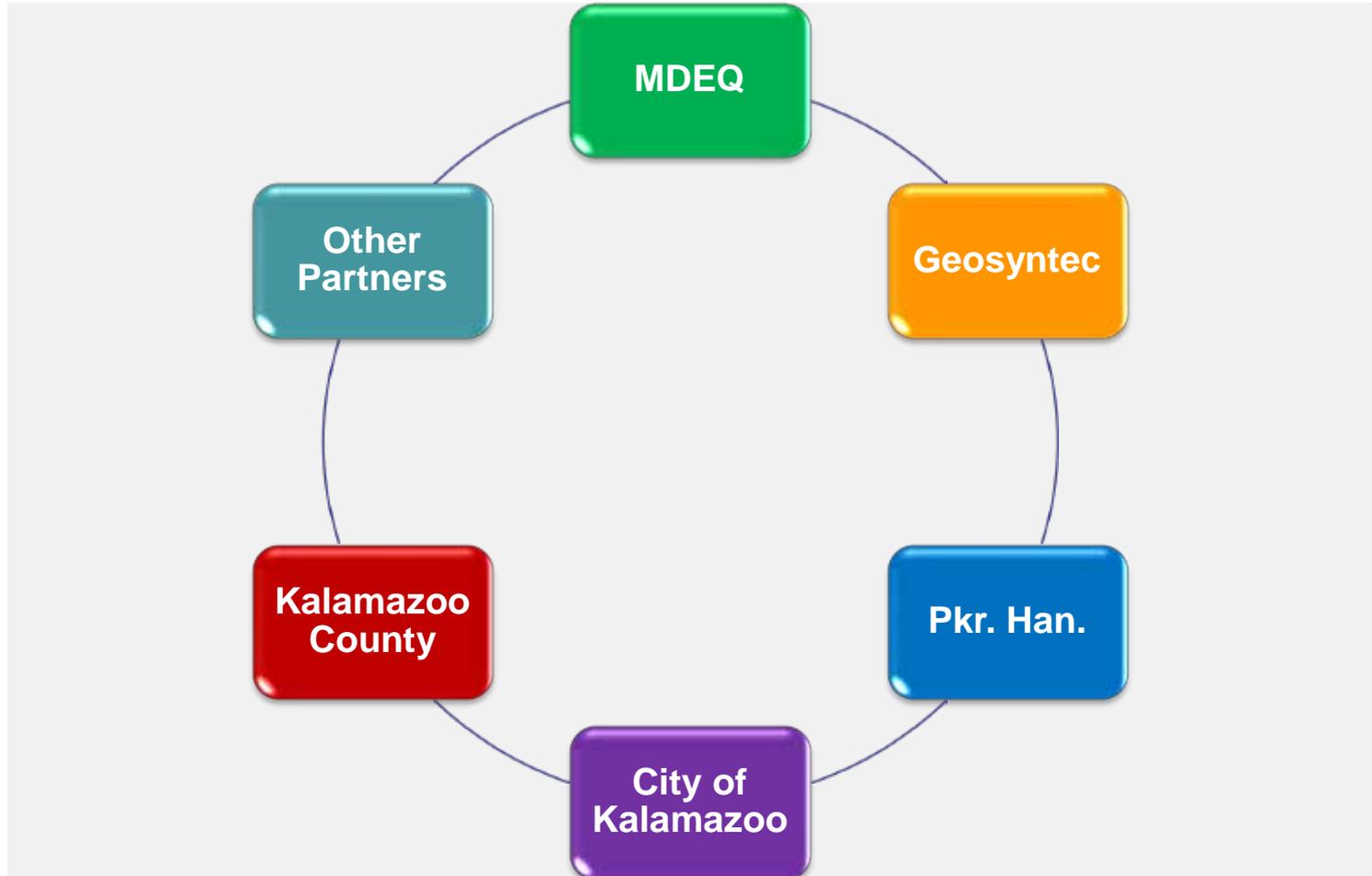


# Drinking Water Pathway Challenge

- How do you deal with so many residential properties?
  - Domestic wells?
- Non-residential properties?
  - Production/process wells?
  - Non-contact cooling wells?
- Where do you start?



# Collaborative Efforts



# Key Components



# Groundwater Use Restriction Zone (GRZ)



## GRZ Boundaries

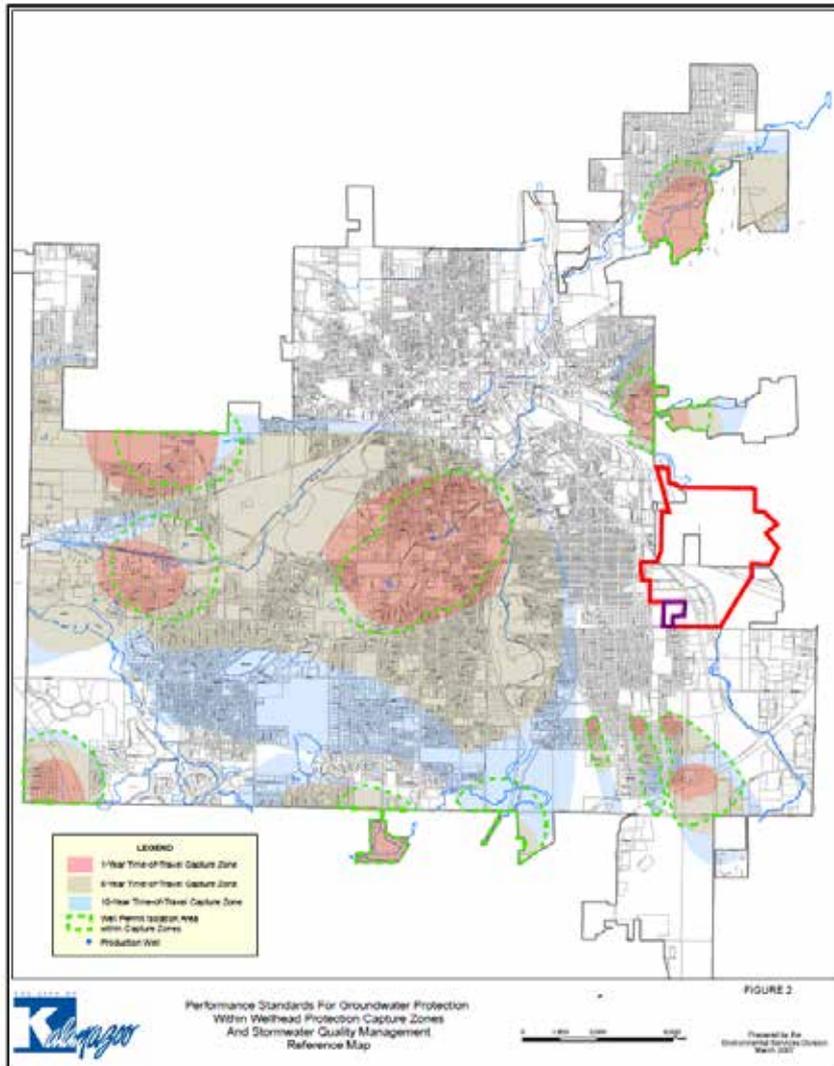
The boundaries of the Proposed GRZ were designated conservatively

- all areas with groundwater contaminant detection
- “buffer zone”
- all off-site sources for which Geosyntec has knowledge of contamination from other sources

# GRZ Protective Mechanisms

- The GRZ prohibits the use of groundwater for potable water (drinking and domestic purposes).
- The GRZ prohibits the installation of water wells within the zone.
- The establishment of the GRZ will eliminate the use of deed restriction on adjacent properties.

# City of Kalamazoo Drinking Water Capture Zones



- Proposed GRZ is well outside 10-year capture zones for all supply wells
- Nearest City water supply well is ~1.5 miles to the north of the Facility on the opposite side of Kalamazoo River (hydraulic barrier)

# Establishment of the GRZ

Kalamazoo County Sanitary  
Code. Article IIIB. Chapter  
20b. And 21b

## A 4-STEP PROCESS:

- Perform “Good-Faith” Efforts
- Preliminary “Application to Consider” to the Kalamazoo County Administrator
- MDEQ Technical Approval
- Kalamazoo County Administration Approval

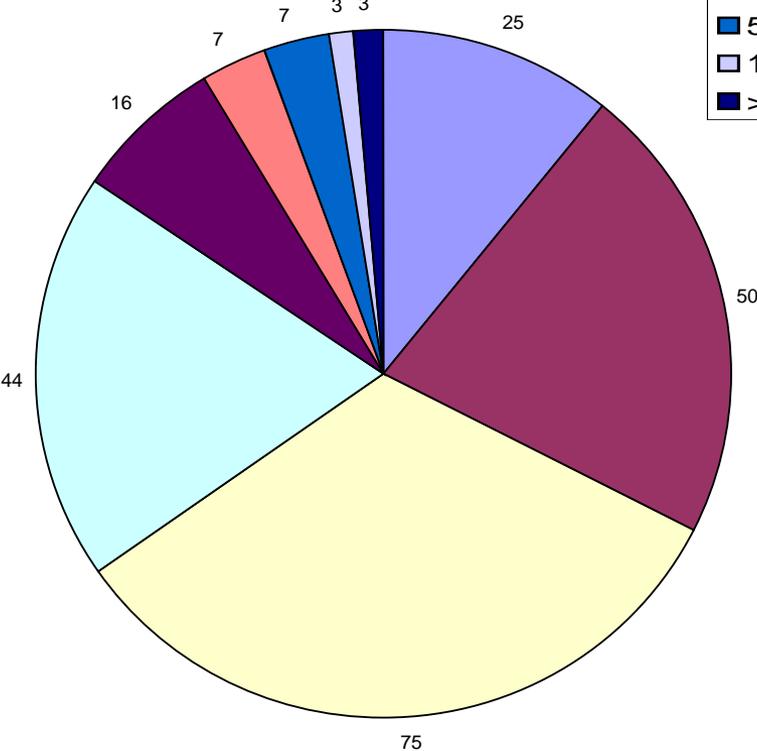
# Chronology of “Good Faith” Efforts/ Well Survey

- **2003-2004:** Door-to door well surveys (272 properties)
- **2005-2010:** Abandoned all accessible wells (22 wells in total)
- **2004-2006:** Reviewed City of Kalamazoo Water Service Department records to identify low City water usage that could be indicative of well water
- **2006:** Connected one residence to City water

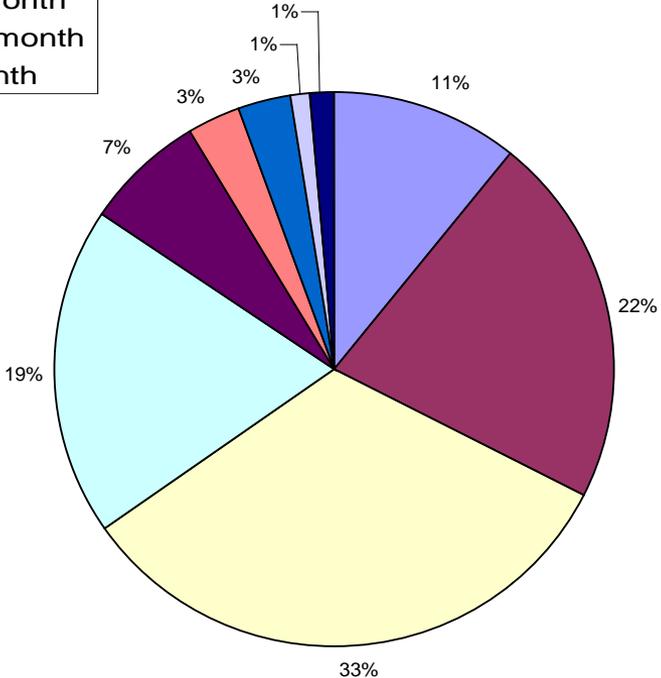
# Evaluation of Water Usage



**Figure 2a**  
 Number of Properties With Estimated Average Monthly Water Usage (m<sup>3</sup>/month) Within the Range Shown in Legend<sup>1</sup>



**Figure 2b**  
 Percentage of Properties With Estimated Average Monthly Water Usage (m<sup>3</sup>/month) Within the Range Shown in Legend<sup>2</sup>



# EXCEPTIONS TO PROHIBITION (VARIANCE)

## Sanitary Code: Section 25b.05. Exceptions for “Existing, Specific Non-Contact Wells”

- The MDEQ determines in writing that the non-contact use of a well will not cause the future migration of contaminated groundwater
- Submit a copy of MDEQ’s written determination to the County Administration
- The County Administrator may execute a waiver allowing the continuing utilization of the well under terms and conditions of the MDEQ

# Variations

- **MDEQ technical approval of variations**
  - 2 non-contact production wells owned and operated by Cytec Industries, Inc. at 2715 Miller Rd
  - Kalamazoo County Jail Well for non-potable water in the event of a public emergency

# Chronology of Variances

- **March 2006:** Submitted application for variance for 2 production wells used for non-contact cooling water at former Cytec site
- **September 2006:** MDEQ granted technical pre-approval of variance for the Cytec production wells
- **February 2009:** Submitted variance application for Kalamazoo County Jail Well, at the request of Kalamazoo County
- **March 2009:** MDEQ granted technical pre-approval of variance for the Kalamazoo County Jail Well

# GRZ Application Process and Milestones

- **2006:** Request for Preliminary Consideration for the Establishment of the GRZ
- **June 2010:** MDEQ technical approval of GRZ including variances
- **April 2012:** Application to KCBC, including notifications to property owners
- **August-October 2012:** Third-Party Review
- **June 2013:** Public Hearing
- **February 2014:** Formal Adoption (effective in April 2014)
- **Annual:** Verification of the variance conditions of the pertinent wells to MDEQ (on-going)

# Agencies/Departments Involved

## MDEQ

- Remediation & Redevelopment Division
- Air Quality Division (SVE system)
- VI and IC TAPS Teams

## Kalamazoo County

- Health and Community Services, Environmental Health Bureau
- Administration: Administrator, Legal Counsel, and Board of Commissioners
- Sheriff (Jail Well)
- Drain Commissioner
- Assessor's Office
- Parks and Grounds (including access permits)
- Road Commission (including ROW permits, utility information)

## City of Kalamazoo

- Water Division (including water well capture zones)
- Engineering Division (including utility information)
- Wastewater Division (including Allnex/Cytec non-contact groundwater discharged to POTW)
- Environmental Services Division (including ROW permits)

# Solution(s)

- **Source Removal / Control**
- **Risk Management**
  - ü **Monitored Natural Attenuation**
    - **Resource Use Restrictions**
      - **Restrictive Covenant On-site**
      - ü **Institutional Control Off-site (Local Ordinance)**



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**NOTICE**

**NON-POTABLE WATER**  
NOT TO BE USED FOR DRINKING,  
WASHING OR COOKING PURPOSES

# Part 201 Facilitation

- **Section 20101(dd), (ee), (uu) NAPL**
- **Section 20114b: Response Activity Plan**
- **Section 20114d: No Further Action Rpt.**
- **Section 20120e(19): GSI**
- **Section 20121: Land Use Restrictions**



# Amendments Influence Outcome



# Outcomes

- **Improved Working Relationships**
- **Protecting Downgradient Residents**
- **No Further Action Completion**



# Questions?



# Michigan Department of Environmental Quality

800-662-9278

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