

# Montague, MI Site Status

July 9, 2018

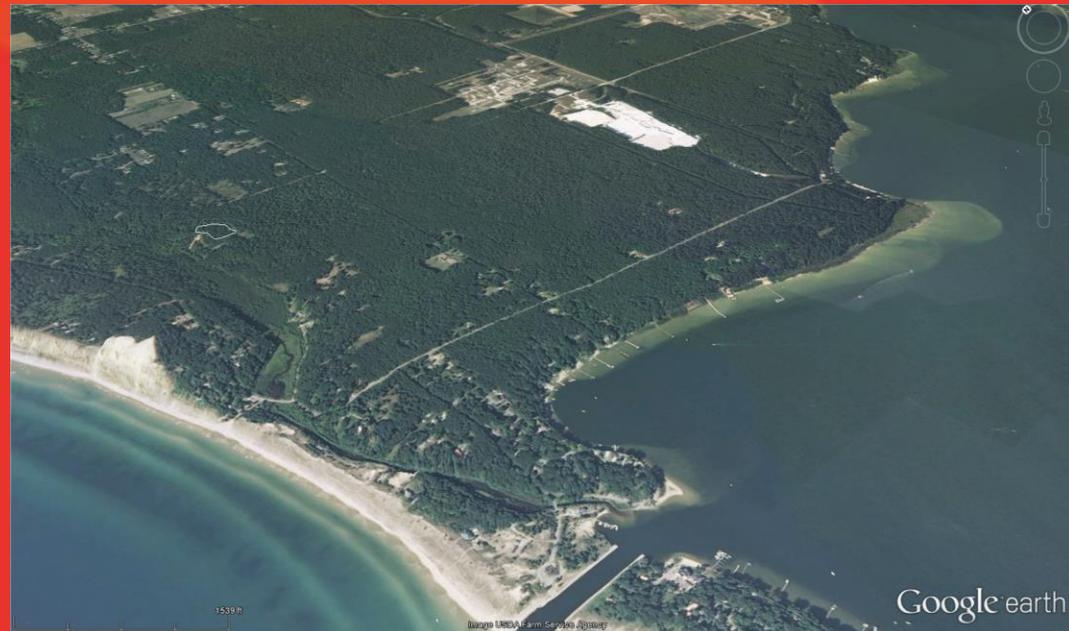


PHOTO: White Lake Channel and Montague Site  
(Jul 25, 2010; from Google Earth)

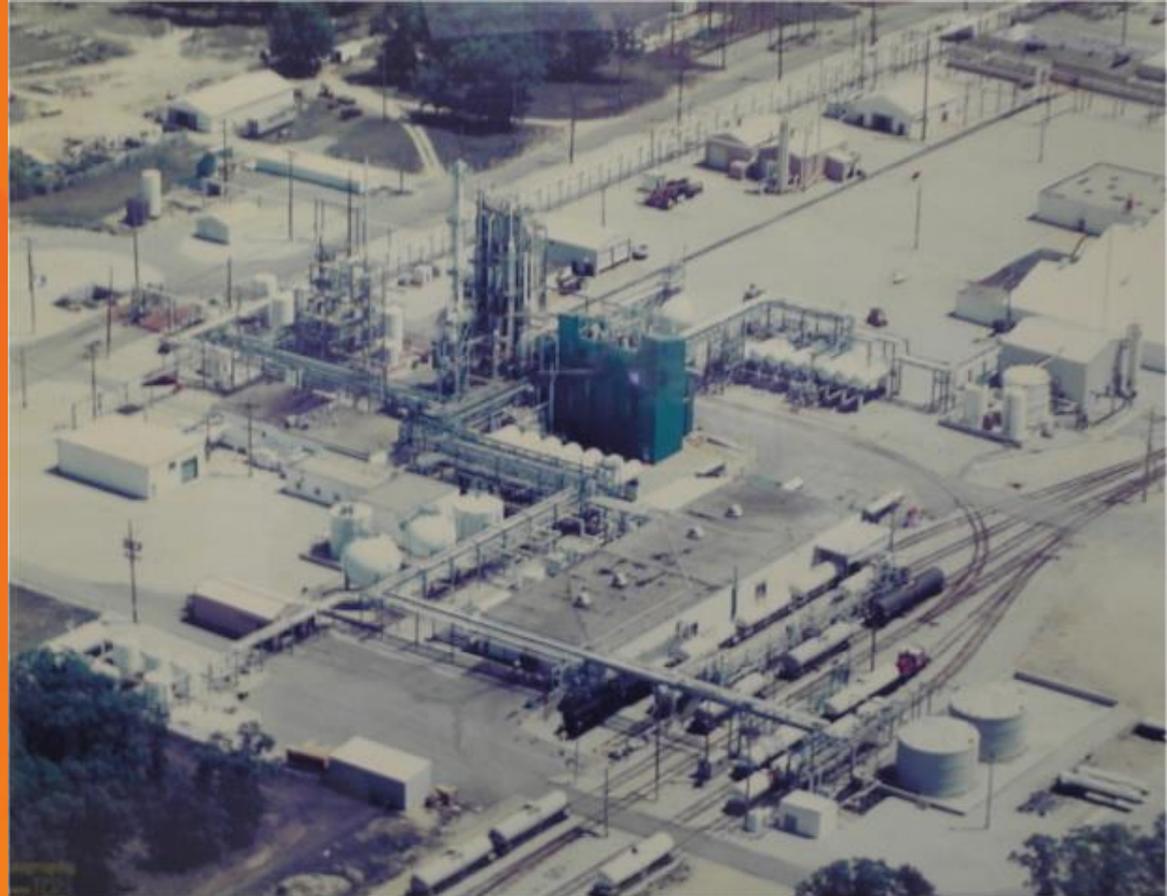
# Agenda

- Background
  - Manufacturing History
  - Features / Site Units
  - Regulatory History
- Current Status
  - Site Remediation Program Status
  - Status of SWMUs and AOCs
- Next Steps
  - Corrective Measures Study (CMS) process
  - Schedule
  - Site use/redevelopment scenarios



# Background

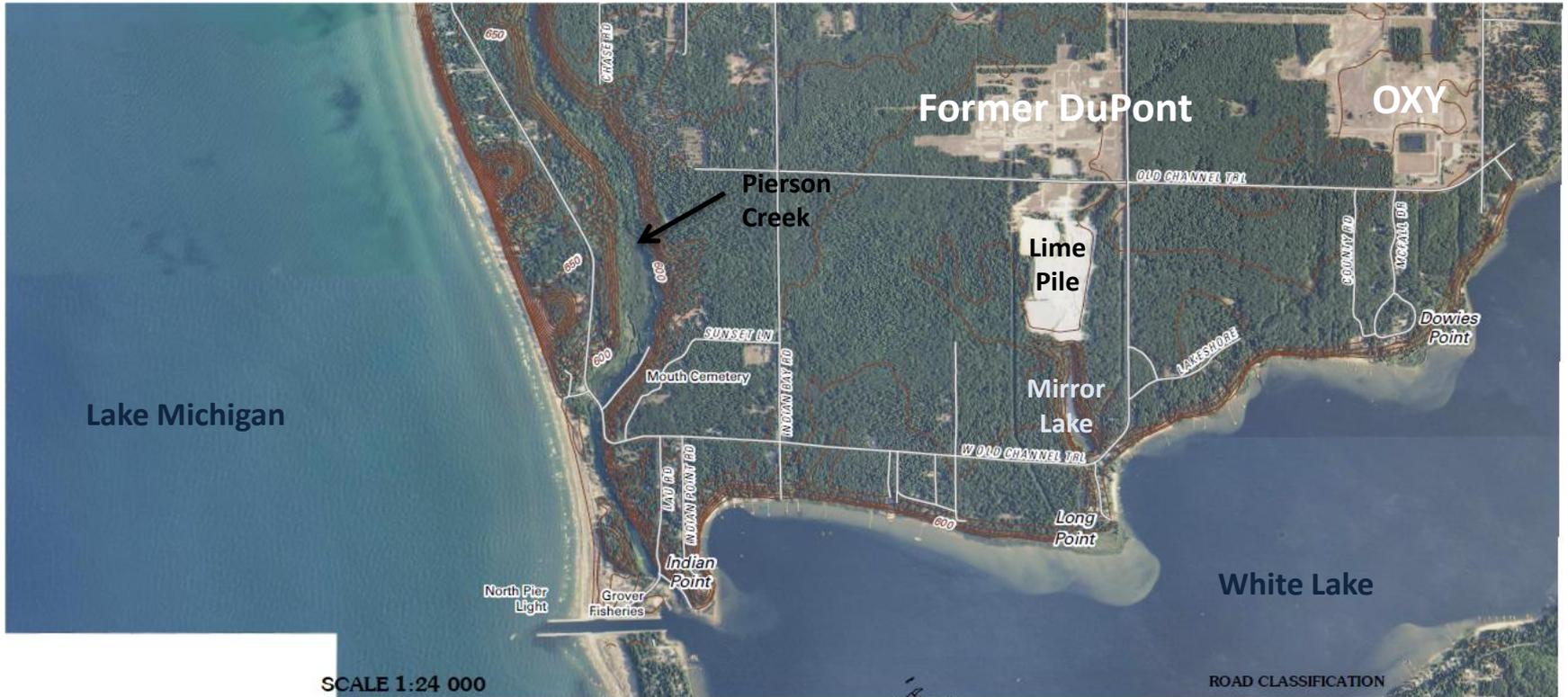
- Site Manufacturing History
- Site Features
- Site Units
- Site Regulatory History



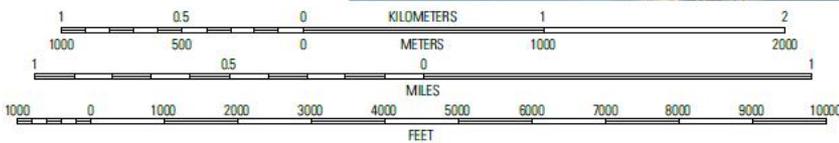
# Site Manufacturing History

- 1956: DuPont completes construction of the neoprene plant and on-site acetylene plant (this acetylene plant operated 1955-1957 and did not produce lime by-product).
- 1961: DuPont purchases neighboring Union Carbide acetylene facility (This process generated hydrated lime by-product, which was accumulated in the Lime Pile).
- 1965: DuPont begins manufacture of Freon<sup>®</sup> products.
- 1972: Neoprene manufacturing unit shut down.
- 1988: DuPont creates Lime Specialties Incorporated to mine and market stored lime by-product.
- 1998: Freon<sup>®</sup> manufacturing unit shut down in 1996 and demolished.
- 2015: Chemours Company was created as separate business that has responsibility for the site.

# Site Features

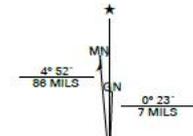


SCALE 1:24 000

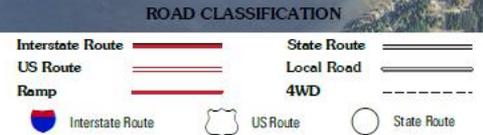


CONTOUR INTERVAL 10 FEET  
 NORTH AMERICAN VERTICAL DATUM OF 1988  
 This map was produced to conform with version 0.5.10  
 of the USGS US Topo Product Standard.  
 A metadata file associated with this product is draft version 0.5.16

Imagery.....NAIP, July 2009 - August 2009  
 Roads.....©2006-2010 Tele Atlas  
 Names.....GNIS, 2010  
 Hydrography.....National Hydrography Dataset, 2009  
 Contours.....National Elevation Dataset, 2006  
 Boundaries.....Census, IBWC, IBC, USGS, 1972 - 2010



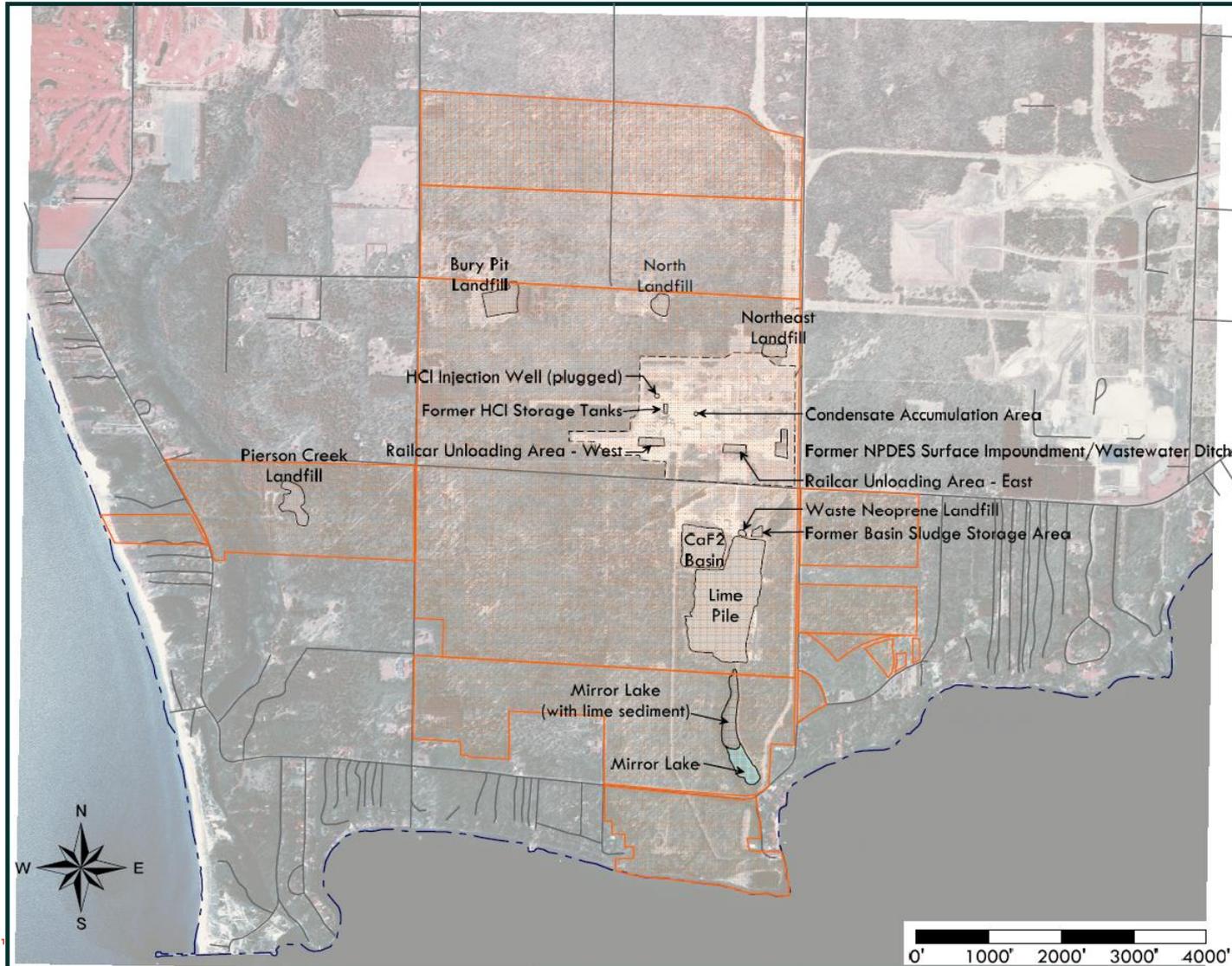
UTM GRID AND 2011 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET



FLOWER CREEK, MI  
 2011

# Site Units

- Landfills
  - Northeast Landfill
  - North Landfill
  - Bury Pit Landfill
  - Pierson Creek Landfill
- Lime Pile Area
  - Lime Pile
  - Mirror Lake
  - Calcium Fluoride Basin
  - Former Basin Sludge Storage Area
  - Waste Neoprene Landfill
- Manufacturing Area
  - Railcar Unloading Area East
  - Railcar Unloading Area West
  - Former HCl Storage Tanks
  - HCl Injection Well
  - Former NPDES Surface Impoundment/Waste water Ditch
  - Condensate Accumulation Area



# Corrective Action Process

- **Assessment of release history and conditions - (RFA)**
- **Investigation of waste management units (WMUs) and areas of concern (AOCs) – RFI**
- **Evaluation of corrective measures - CMS**
- **Implementation of corrective measures for desired land use utilizing environmental protection standards authorized by the U.S. Environmental Protection Agency - CMI**

# Current Status

- Site Remediation Program Status
- Status of SWMUs and AOCs

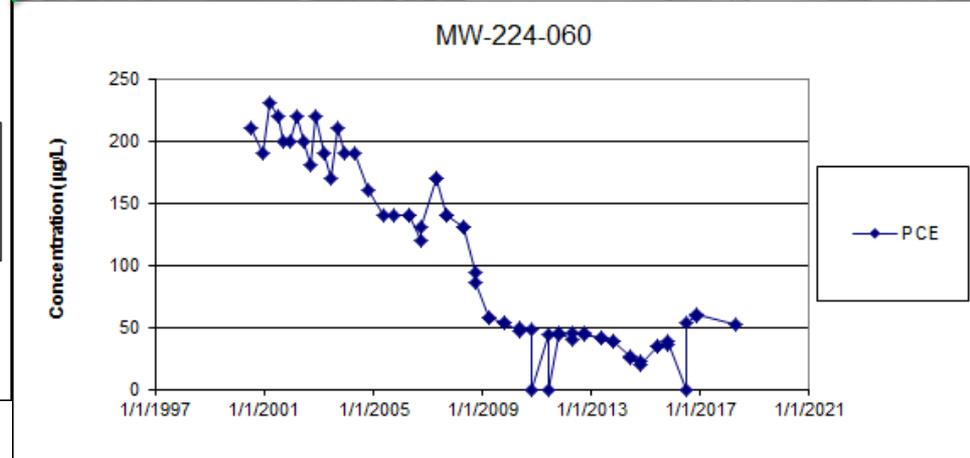
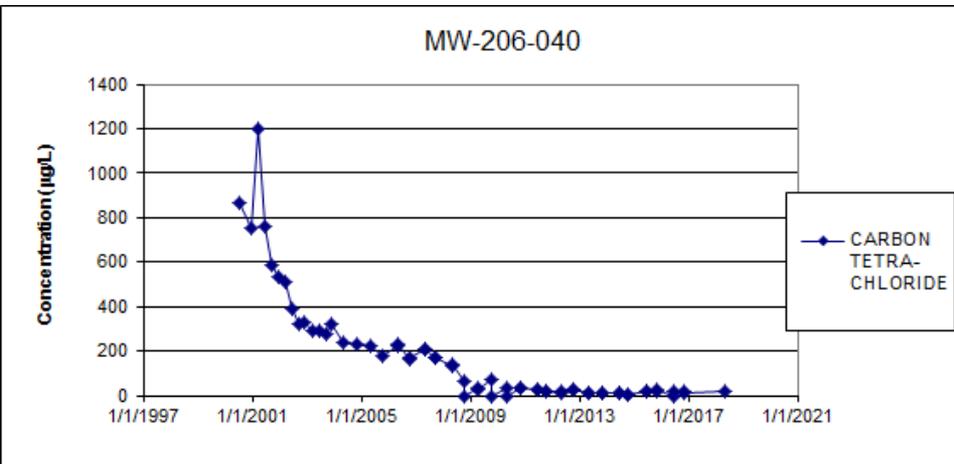
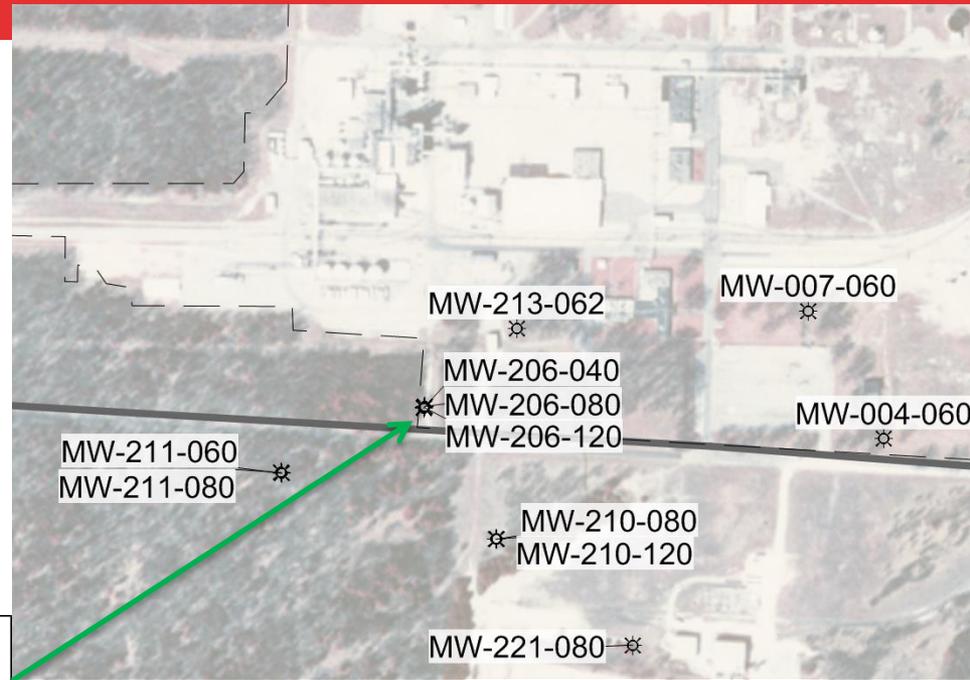
# Site Remediation Program Status

- Groundwater pump and treat system
- Objective of the system:
  - contain groundwater with site-related constituents above “Final Acute Values” (provided by MDEQ in an August 22, 2012 letter).
- Current system description:
  - Four active wells, IW-06-140, IW-07-144, IW-08-142, and IW-09-140
  - System operates between 600 and 700 gallons per minute
- Reporting to MDEQ to document hydraulic capture of plume with concentrations above FAV. Reporting also documents the compliance monitoring of the mixing zone (for low-concentration plume edges).



# Trends – White Lake Plume Near-Source

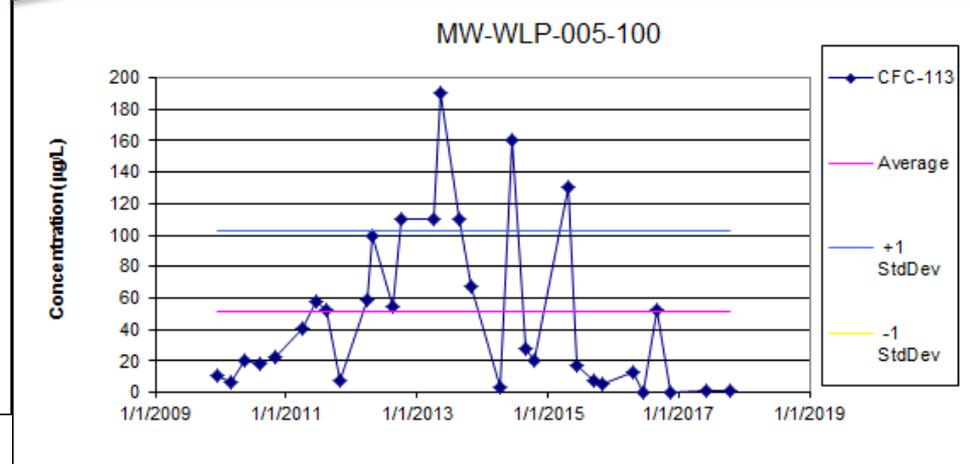
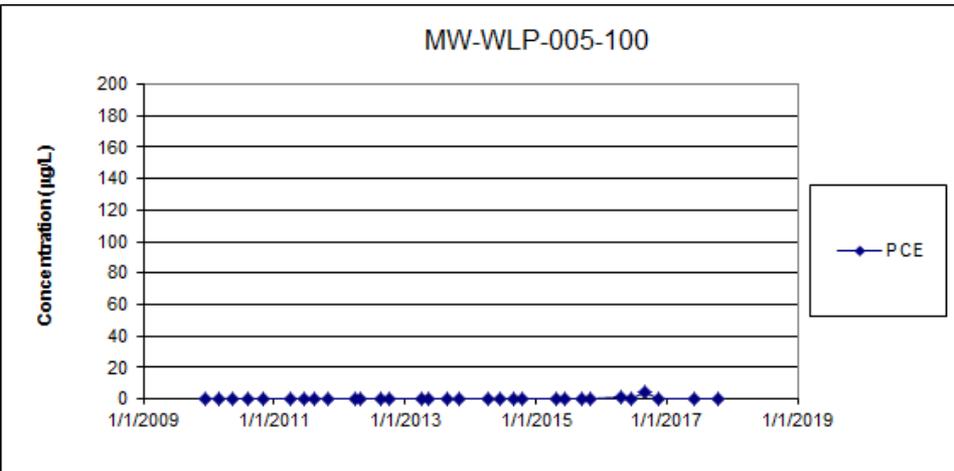
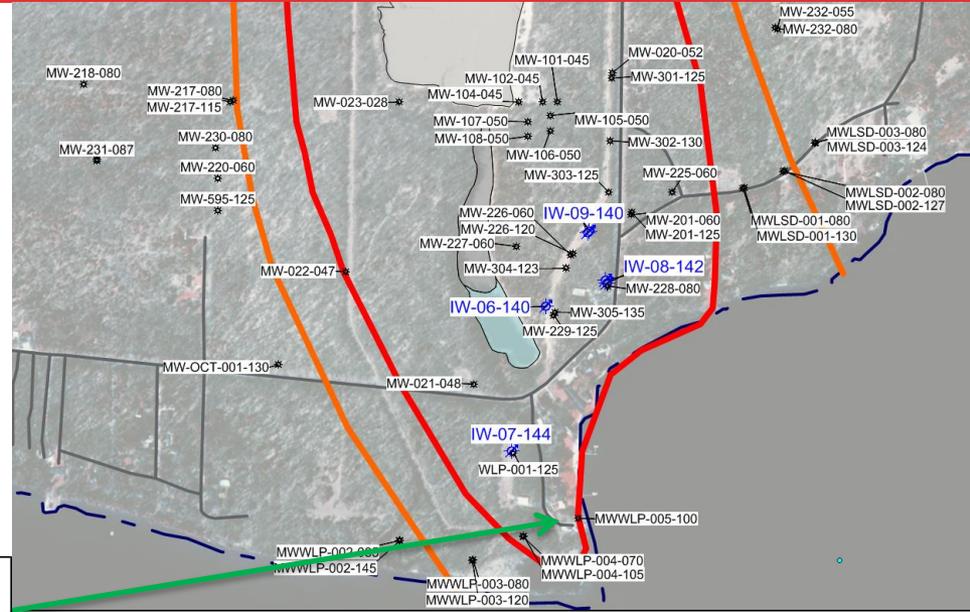
- MW-206-040 is downgradient (south) of the former Freon<sup>®</sup> railcar loading area and once had noticeably higher concentrations.





# Trends – White Lake Plume Edge

- MWWLP-005-100 is at the shoreline of White Lake.
- This well shows if there are constituents at the edge of White Lake.



# Status of SWMUs / AOCs

Unit	Site Investigation		Corrective Measures Study	
	No Further Investigation	Reports documenting data	No Further Actions Needed	Proceed to CMS
Northeast Landfill	✓	2012 Investigation Report		✓
North Landfill	✓	2012 Investigation Report		✓
Bury Pit Landfill	✓	2014 Addendum No. 3		✓
Pierson Creek Landfill	✓	2014 Addendum No. 2		✓
Pierson Creek	✓	2017 Annual Report		✓
Former Basin Sludge Storage Area	✓	2014 Addendum No. 1		✓
Waste Neoprene Landfill	✓	2014 Addendum No. 1		✓
Lime Pile	✓	2006 Prioritization Report		✓
Mirror Lake	✓	2012 Investigation Report		✓
Calcium Fluoride Basin	✓	2006 Prioritization Report		✓
Railcar Unloading Area East	✓	2012 Investigation Report	✓	
Railcar Unloading Area West	✓	2012 Investigation Report	✓	
Former HCl Storage Tanks	✓	2012 Investigation Report	✓	
HCl Injection Well	✓	2006 Prioritization Report	✓	
Former NPDES Surface Impoundment/Wastewater Ditch	✓	2012 Investigation Report	✓	
Condensate Accumulation Area	✓	2006 Prioritization Report	✓	

## Notes:

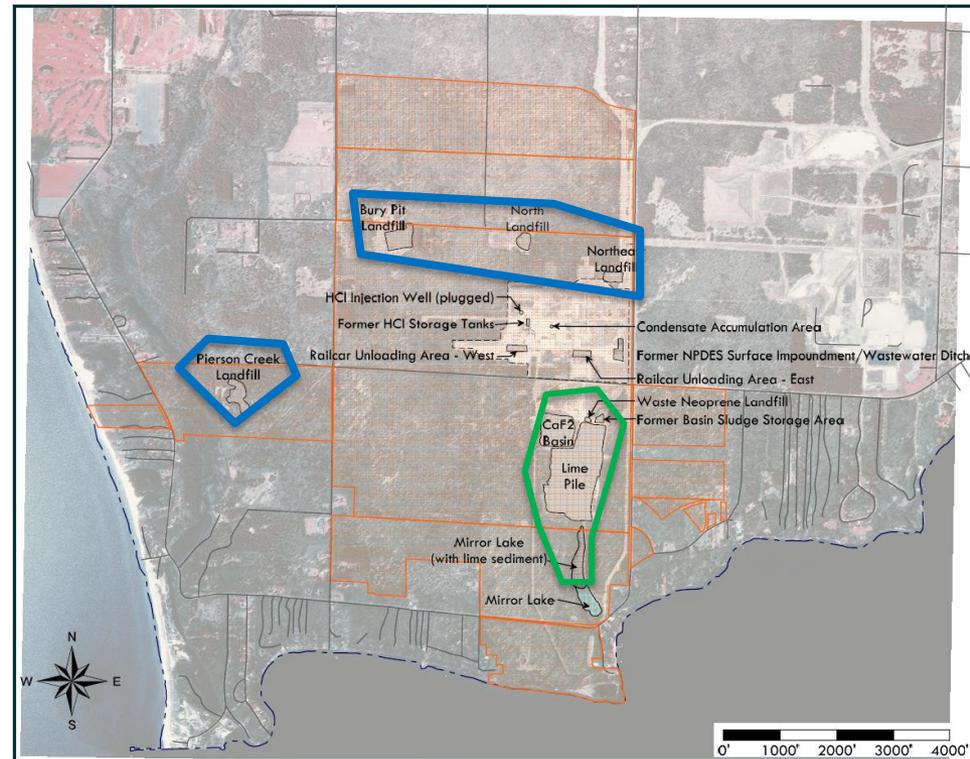
✓ : Proposed path forward is denoted with a checkmark.

# Next Steps

- CMS process and possible outcomes
- Schedule
- Site Use / Redevelopment Scenarios

# CMS Process - Units

- Ten units recommended for CMS
- Fall into two geographic categories:
  - Landfills outside the main fenced area shown in dark blue boxes (Northeast, North, Bury Pit, and Pierson Creek Landfills and the Pierson Creek groundwater plume).
  - Lime pile and four associated areas in green (this includes Mirror Lake).



# CMS Process – Develop RAOs

- First step in the CMS is to determine remedial action objectives (RAOs) consistent with future land use.
- RAOs will be selected to address concerns related to potential direct contact exposure and migration of constituents from soil to groundwater for most of the landfill units. RAOs for the Lime Pile, Mirror Lake, and associated units will be driven more by ecological habitat restoration.

Unit	Exposure to Site-Related Constituents			Ecological Habitat Restoration	Notes
	Direct Contact Exposure	Migration to Groundwater	Exposure to Groundwater		
Northeast Landfill	✓	✓			
North Landfill	✓				
Bury Pit Landfill	✓				
Pierson Creek Landfill	✓	✓			Groundwater discharge to Pierson Creek
Pierson Creek			✓		
Former Basin Sludge Storage Area				✓	These units are under the Lime pile.
Waste Neoprene Landfill				✓	
Lime Pile		✓		✓	
Mirror Lake		✓		✓	
Calcium Fluoride Basin	✓			✓	
<b>Notes:</b>					
✓ : Confirmed or potential concern at this unit.					

# CMS Process – Evaluate Options

- The next step is a screening of potential remedial actions against threshold criteria for each unit. These criteria are:
  - Technology must meet the RAOs
  - Effectiveness in controlling sources of potential release
  - Performance, reliability and ease of implementation and
  - Cost of the remedy
- Based on the screening, a detailed evaluation is performed (the feasibility study) on the technologies that met the threshold criteria.

# CMS Process – Feasibility Study

- The feasibility study evaluates technologies against one another considering the following balancing criteria:
  - Protectiveness of HH&E
  - Compliance with Applicable or Relevant and Appropriate (regulatory) Requirements (ARARs)
  - Long-term reliability and effectiveness
  - Reduction in toxicity, mobility, or volume of waste
  - Short-term effectiveness
  - Implementability
  - Cost
  - Regulatory acceptance
  - Community acceptance

# CMS Process – Example: Landfill Units

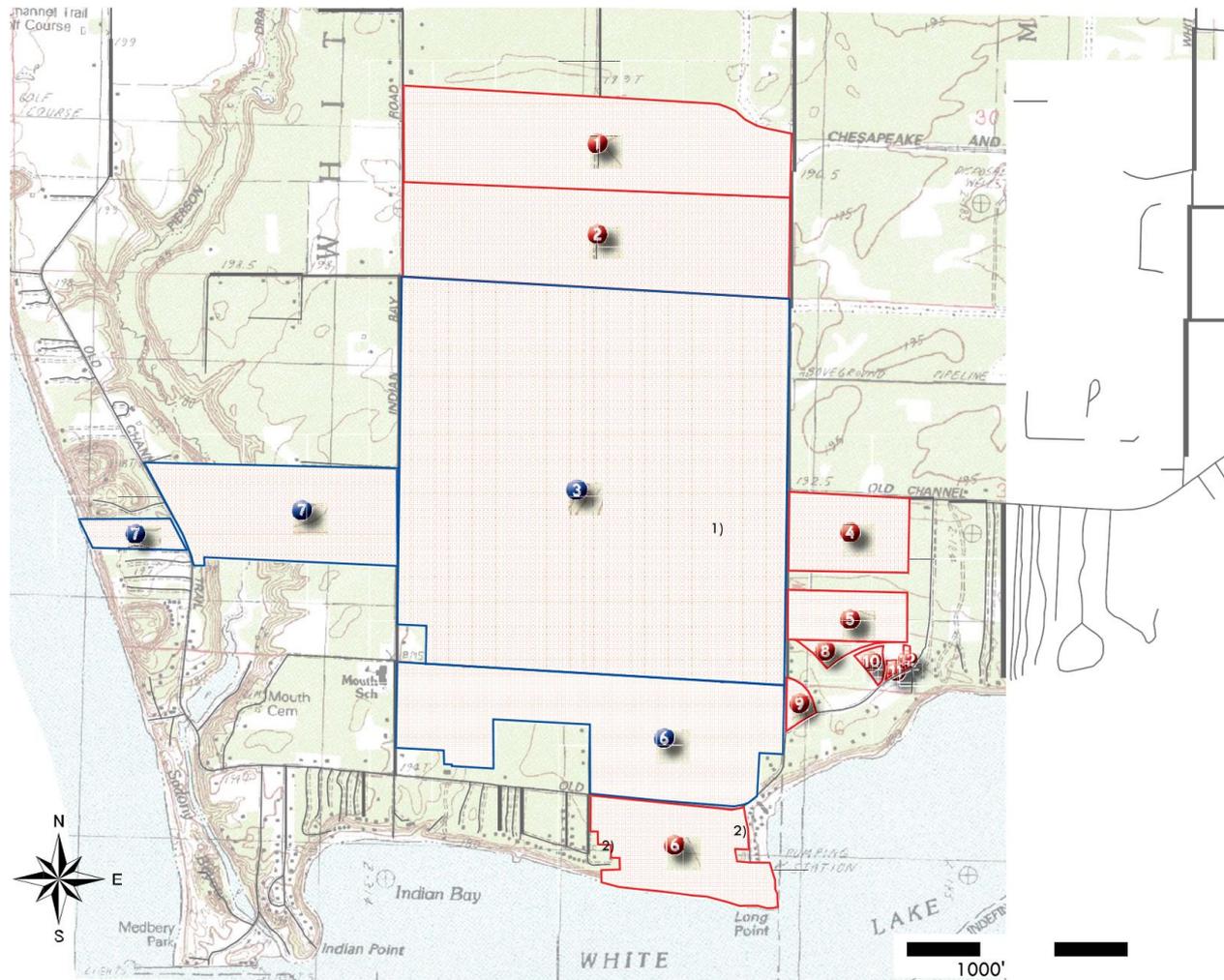
- As an example, the following are preliminary options for the Northeast, North, Bury Pit, and Pierson Creek Landfills:
  - Fencing and institutional controls
  - Capping and institutional controls
  - In-place stabilization with capping and institutional controls
  - Excavation and consolidation to on-site engineered landfill, fencing, and institutional controls.
  - Removal of waste for offsite disposal (no post remediation institutional controls needed)

# CMS Schedule

- An agreement will be developed by MDEQ and Chemours. This agreement will set expectations for future land use, establish preliminary RAOs, describe the CMS deliverables, and provide a conceptual schedule for the CMS.
- Coincident with the agreement, the technology screening will be developed with MDEQ to streamline the selection of potential remedial actions.
- Both the agreement and the technology screening expected to be completed by the end of 1<sup>st</sup> quarter of 2019.
- The detailed Feasibility Study Report is expected to be completed by approximately the end of 3<sup>rd</sup> quarter 2019.
- After approval of the Feasibility Study, MDEQ will publish the final remedy decision with a request for public comment. This is estimated to be done during the 4<sup>th</sup> quarter of 2019.
- After MDEQ issues the final remedy, a Corrective Measures Implementation Work Plan will be written that describes the remedial actions and provides a schedule for the remedial actions.

# Site Use / Redevelopment Scenarios

# Future Site Use - Parcels



# Principles for Redevelopment of the Montague Site

- We are in early stages of developing a land re-use approach and strategy, now that site's environmental investigations are completed.
- Redevelopment and reuse of the site will be consistent with Chemours' core value of Protection of Human Health and the Environment.
- Any reuse will be consistent with local land uses that fit into the overall area development, and land conservation will be strongly considered and explored.
- We will conduct thorough due diligence of any potential developer on the site.

# Sustainable Forestry Program

- Timber harvesting conducted under direction of Registered Consulting Forester who understands local regulations and other considerations.
- Selective harvesting is a sustainable practice that enhances the growth of wooded properties and improves their longer term viability.

# Lime Recycling and Re-use

- Potential uses/re-uses for the lime pile have been identified over time:
  - Wastewater pH control
  - Soil stabilization and pH control
  - Paper processing
  - Pickle liquor neutralization for steel products
  - Leather tanning process and byproduct stabilization
  - Agricultural soil preparation
- Significant progress made in eliminating the lime pile through productive re-uses, over time:
  - Initial lime volume estimated at ~ 1 Million cubic yards (1983)
  - Volume reduced by 25% to ~ 780 k cubic yards (by 2000), from a mining/marketing program resourced by DuPont, initiated in 1988
  - Volume further reduced another 25% to ~ 580 k cubic yards (by the end of 2009)
  - Volume continues to decline by ~ 5 - 10 cubic yards/year (since 2010)
- Chemours is looking for additional ways to accelerate the re-use/removal of the remaining lime pile
  - An encouraging Chemours internal opportunity has been identified which could consume additional lime volume at one of our operating facilities and is under pilot evaluation now.



Thank you