

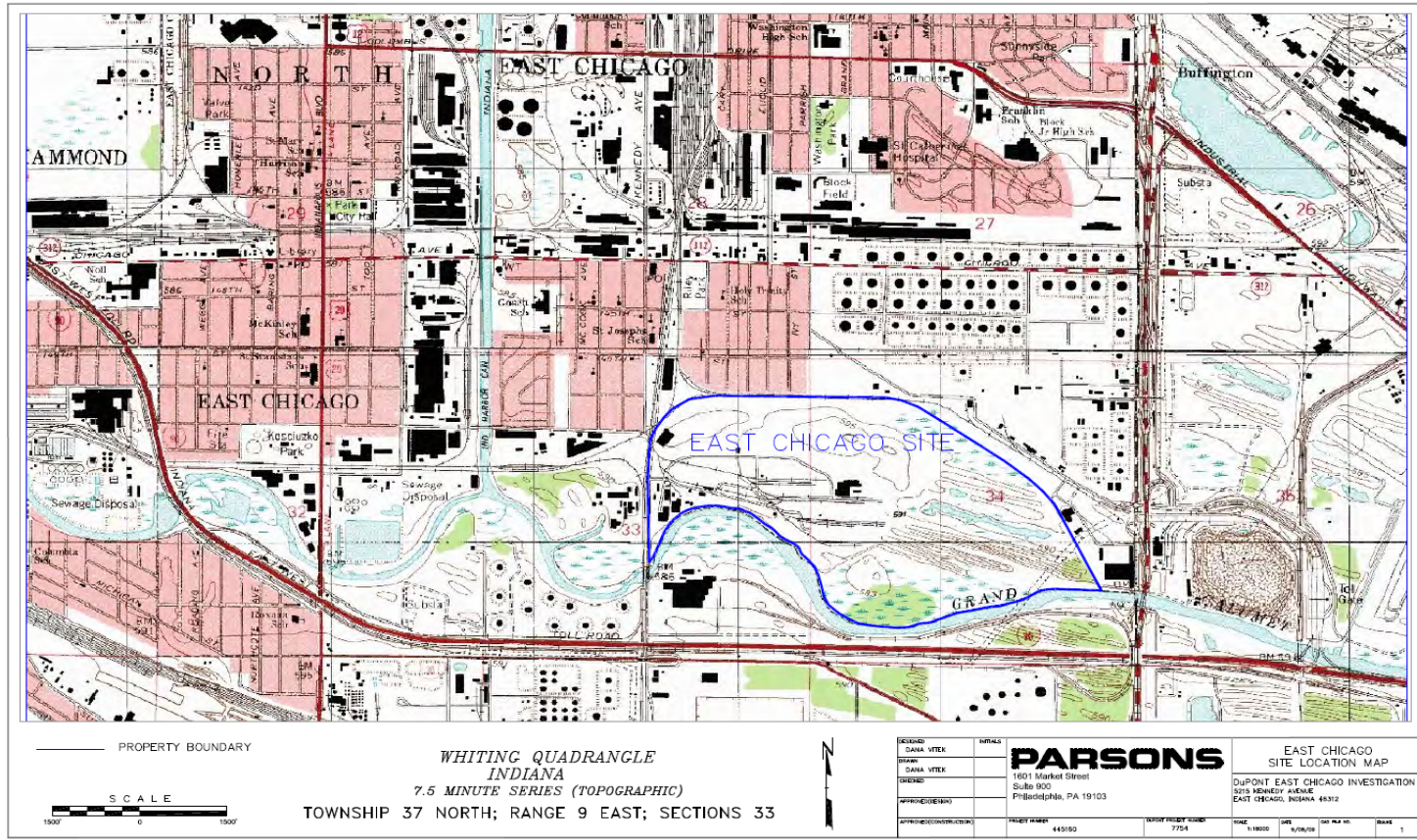
**DuPont East Chicago Facility**  
**RCRA Corrective Action**  
**Proposed Cleanup Plan**  
**for the**  
**Western Portion/Industrial Area**

East Chicago Public Meeting  
DuPont Statement of Basis  
January 10, 2018

Jennifer Dodds, EPA, LCD



# DuPont East Chicago





## DuPont East Chicago

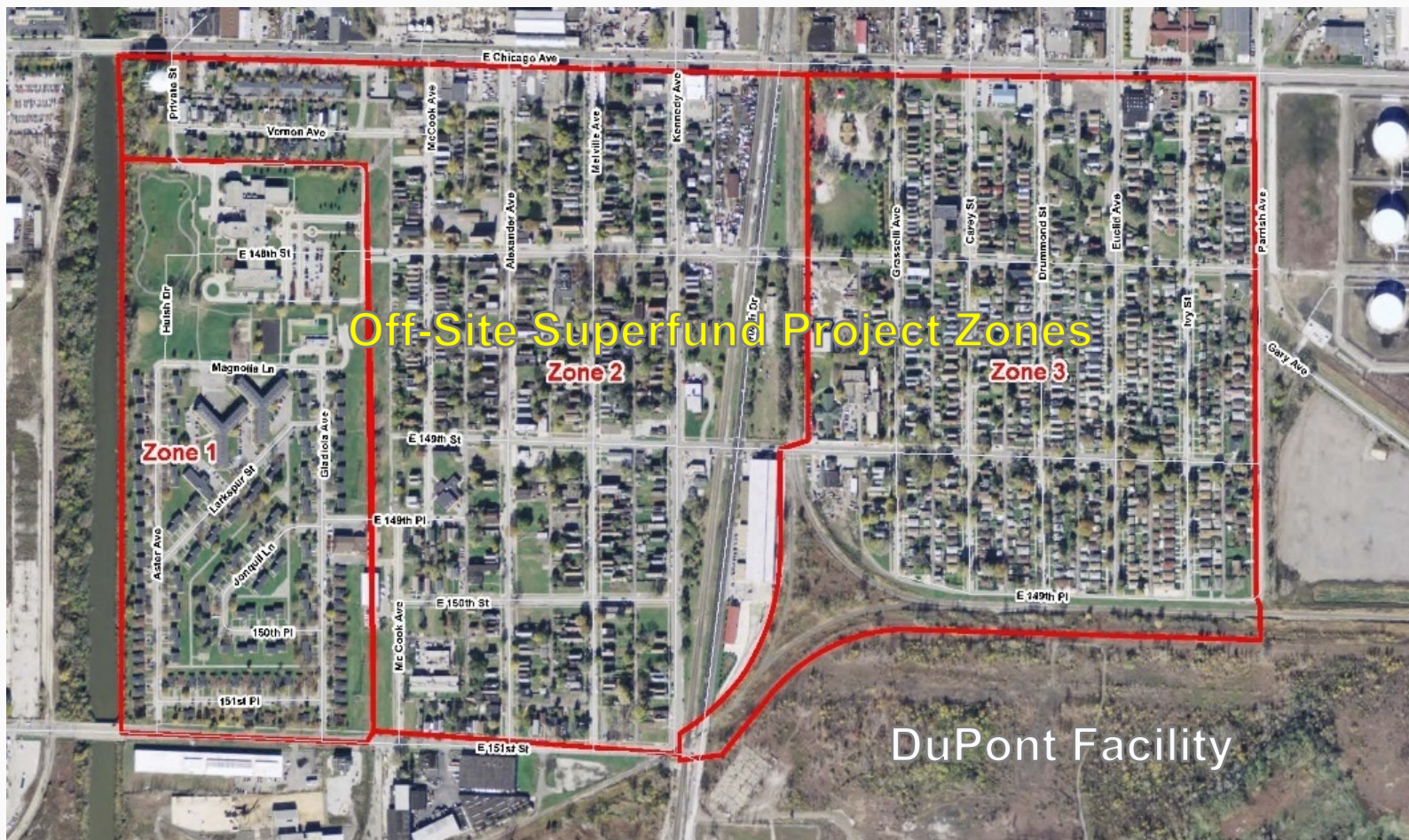


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U.S. Environmental Protection Agency

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# DuPont East Chicago





## DuPont East Chicago

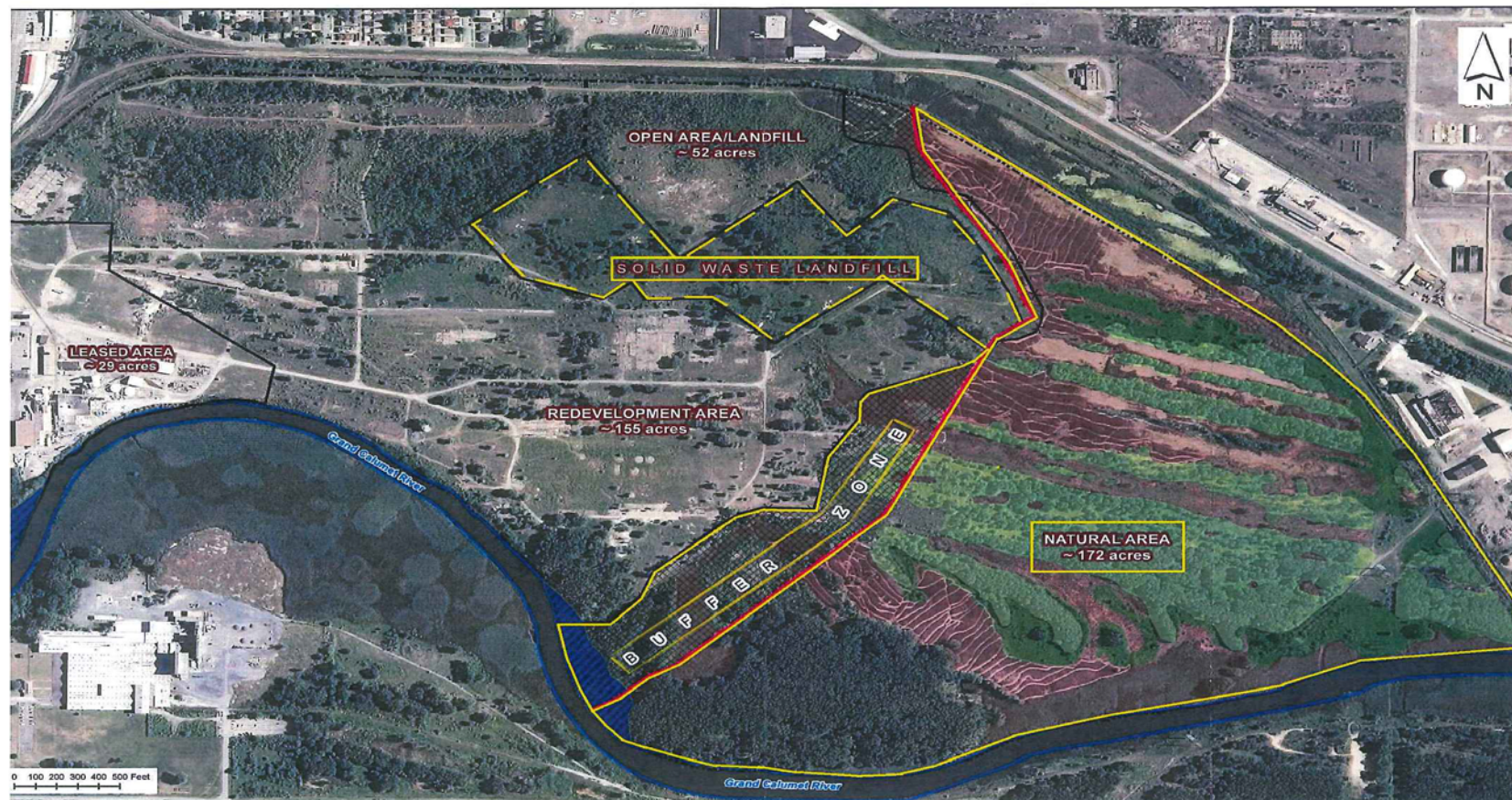
- Entire DuPont East Chicago Site is ~440 acres
- For the purposes of describing the hazardous waste investigations and proposed cleanup approaches, the DuPont East Chicago facility has been divided into 5 areas.
- 2 areas were cleaned up under a separate Natural Area and Buffer Zone Final Decision in 2014
- ~77,000 cubic yards of contaminated soil removed
  - **Natural Area/Eastern Area:** This undeveloped area occupies approximately 172 acres and contains original plains/dunes geomorphology and associated plant communities.
  - **Buffer Zone Area:** This area occupies approximately 20 acres and is located directly east of the Open and Redevelopment Areas and separates these areas from the adjacent Natural Area.



## DuPont East Chicago

The three remaining areas (~235 acres) are included as part of the 2017 Western Portion/Industrial Area Statement of Basis

- **Redevelopment Area:** This area occupies approximately 155 acres and encompasses the former manufacturing areas located in the central and west portions of the property
- **Open Area:** This area occupies approximately 50 acres and includes an approximately 30-acre former landfill
- **Leased Area:** DuPont has leased this 30-acre active manufacturing area to W.R. Grace & Co. and Grace Davison since early 2000, but Chemours maintains ownership



**PARSONS** Figure Natural Area Ridge and Swale Vegetation  
 Natural Area Evaluation and Management Plan  
 DuPont East Chicago Facility  
 East Chicago, Indiana

Current Easement Boundary  
 New Fence  
 Extended Buffer Zone (~23 acres)  
 Future GCR-SRP Shell Wetlands

Plant Community Mapping  
 Swale (Wetland)  
 Dune/Ridge - Mesic Prairie  
 Dune/Ridge - Oak Barrens

River  
 Property Boundary

Prepared by: Garnet Peterson	Date: 8/3/2013	DuPont Project 507942
Reviewed by: Carina Victoria	Figure	PARSONS Proj 449650



## Identification of Risks

- Order signed in 1997 – RCRA Facility Investigations Reports in 2002 and 2004 – First Corrective Measures Study in 2006 - EPA required additional investigations
- Based on years of previous sampling, studies, and risk assessments, arsenic, lead, zinc, and cadmium are the primary contaminants in the soil (from about 0 to 10 feet below ground surface).
- Arsenic is considered the primary contaminant in groundwater, based on its distribution and elevated concentrations.





## **Industrial Area Remediation Approach**

### **1. Reduce groundwater contamination**

- Cover or remove contaminated soils – remove significant amount of the contaminated soils serving as a ongoing source to groundwater contamination

### **2. Manage/clean up the contaminated groundwater plumes**

- Improve the groundwater quality before it exits the DuPont property
- Plume management/remediation to effectively improve the groundwater quality at compliance points
- Speed up time to achieving clean up goals

### **3. Reduce risk by preventing exposure to surface soil**

- Remove or cover contaminated soil
- Incorporate redevelopment into remediation if possible



## Industrial Area Statement of Basis

- **Soil**
  - Source area soil excavation
  - In-situ stabilization (ISS) of saturated soils and excavated soil treatment with on-site management – contaminant is treated in place
  - Permeable soil cover
  
- **Groundwater**
  - In situ chemical fixation (ISCF) via sulfate reduction injections
  - Bio-wall trench located along the southern property line upgradient of the river and within the northern source areas of the facility.
  
- **Institutional Controls**
  - Prohibit groundwater use through environmental restrictive covenant
  - Personal Protective Equipment (PPE) use
  
- **Financial Assurance**
  
- **5-Year Remedy Review**



## Soil

Arsenic, lead, zinc, and cadmium are the primary contaminants in the soil (from about 0 to 10 feet below ground surface)

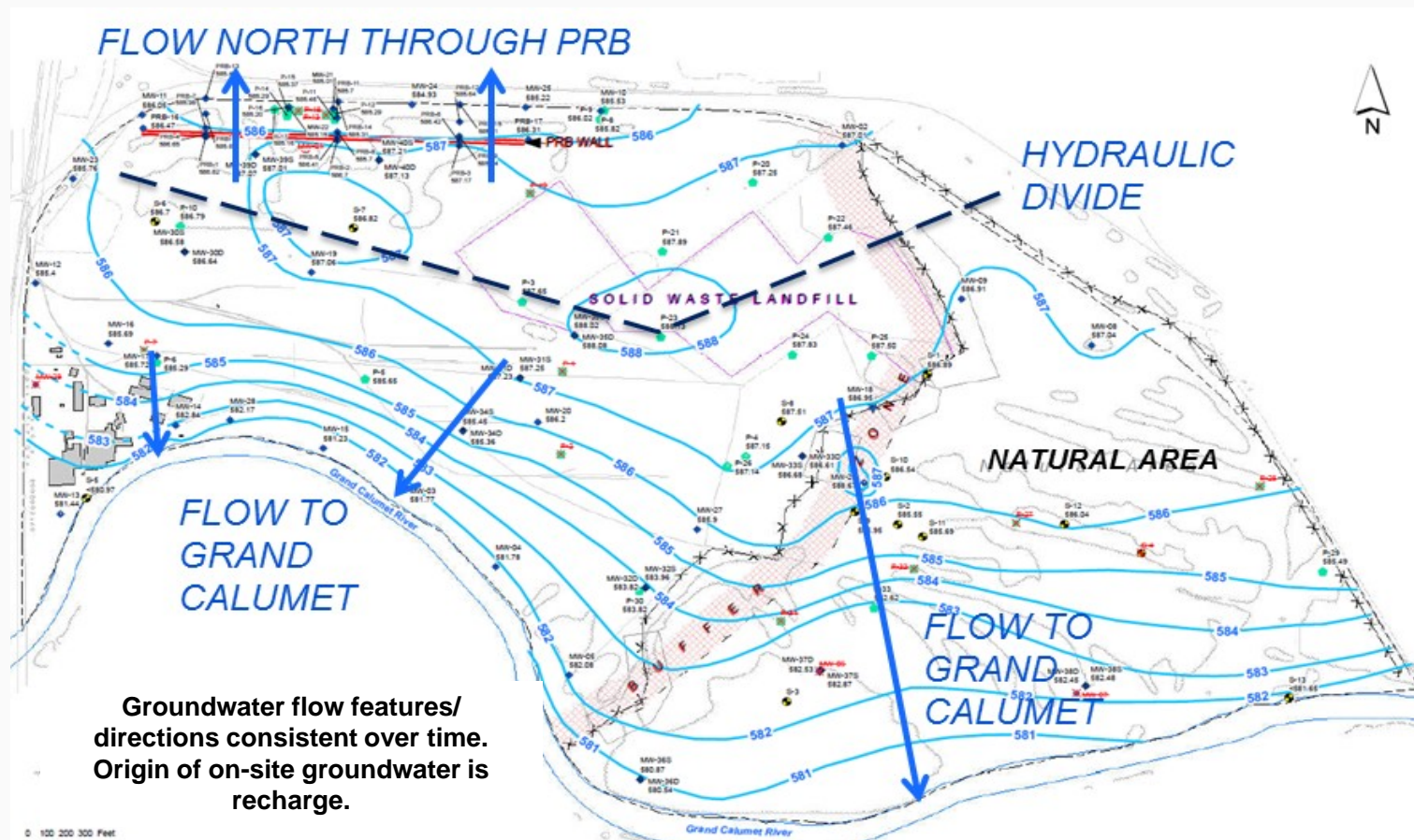
- Achieve a residual target cancer risk of one additional cancer case out of 10,000 people
- Achieve EPA's acceptable residual risk criteria for non-cancer contaminants (i.e. zinc)
- Achieve clean up goal through clean up of contaminated soils and soil covers



## Soil

- Excavate ~61,780 cubic yards of highly contaminated soil in the redevelopment area
  - Excavate down to saturated zone (where soil meets groundwater)
  - Treatment of saturated soil at the bottom of the excavations will further decrease arsenic mobility – in-situ stabilization (ISS)
  - Backfill with clean soil
- Maintain existing pavement or install soil covers to reduce dispersal and human health and ecological risks
- Leased Area - Excavate ~14,000 cubic yards of contaminated soil and maintain existing pavement or other barriers

# Groundwater Flow within DuPont East Chicago Site





## Groundwater

- Arsenic is considered the primary contaminant in groundwater, based on its distribution and elevated concentrations.
- Clean up goals:
  - Groundwater, northern property boundary
    - Long-term: Arsenic MCL, 10  $\mu\text{g/L}$
    - Short-term: Measurable improvement in groundwater quality (5 years after remediation is complete)
  - Groundwater, southern property boundary
    - Long-term: IDEM surface water standard, 148  $\mu\text{g/L}$
    - Short-term: Measureable improvement in groundwater quality (5 years after remediation is complete)



## Groundwater

Reduce arsenic load to groundwater through soil removal and contaminant fixation

- Enhanced Sulfate Reduction Bio-Barrier
  - Trench backfilled with sulfate to stimulate microbial sulfate reduction
  - Chemically “trap” arsenic on the facility (zones of iron sulfides)
  - Significantly reduces or eliminates arsenic migration beyond property boundary
- Enhanced Microbial Sulfate Reduction Injections
  - Treatment zones transecting the northern and southern arsenic plumes
  - Intercept and “trap” arsenic migrating in groundwater
- Other metals, such as zinc, cadmium, and lead also remain immobilized because of the sulfate injections
  - Observed in both laboratory and on-site pilot tests



## **Environmental Restrictive Covenant and Deed Restrictions**

- Record, implement and maintain institutional controls
  - Prohibit non-industrial/commercial use of property
  - Prohibit installation of on-site drinking water supply wells
  - Require permits for all non-potable groundwater production wells
  - Maintain all barriers and security fences
  - Health and safety plans to protect on-site workers
- Record deed restrictions in an EPA-approved environmental restrictive covenant and deed restriction that runs with the land
- If the property is sold, the purchaser must either accept these restrictions as part of the deed transfer or further clean up the property





## Financial Assurance

- Chemours and/or DuPont are required to provide financial assurance
  - Ensure proposed remedy can be implemented over remedy's lifetime
  - Update cost estimates
  - Include long term operation, maintenance and monitoring
- Require five-year remedy reviews – adjust remedy if needed
- Issue corrective action implementation order to ensure compliance with the final clean up decision



## Community Involvement and Redevelopment

- Most, if not all, former industrial sites have residual contamination
- EPA promotes re-use of these Brownfield sites- redevelopment of abandoned, idled and underused industrial and commercial facilities with contamination
- Any redevelopment subject to EPA, State, County, and City requirements
- Chemours has worked closely with the City of East Chicago to identify an experienced developer, with potential reuse acceptable to the city

