



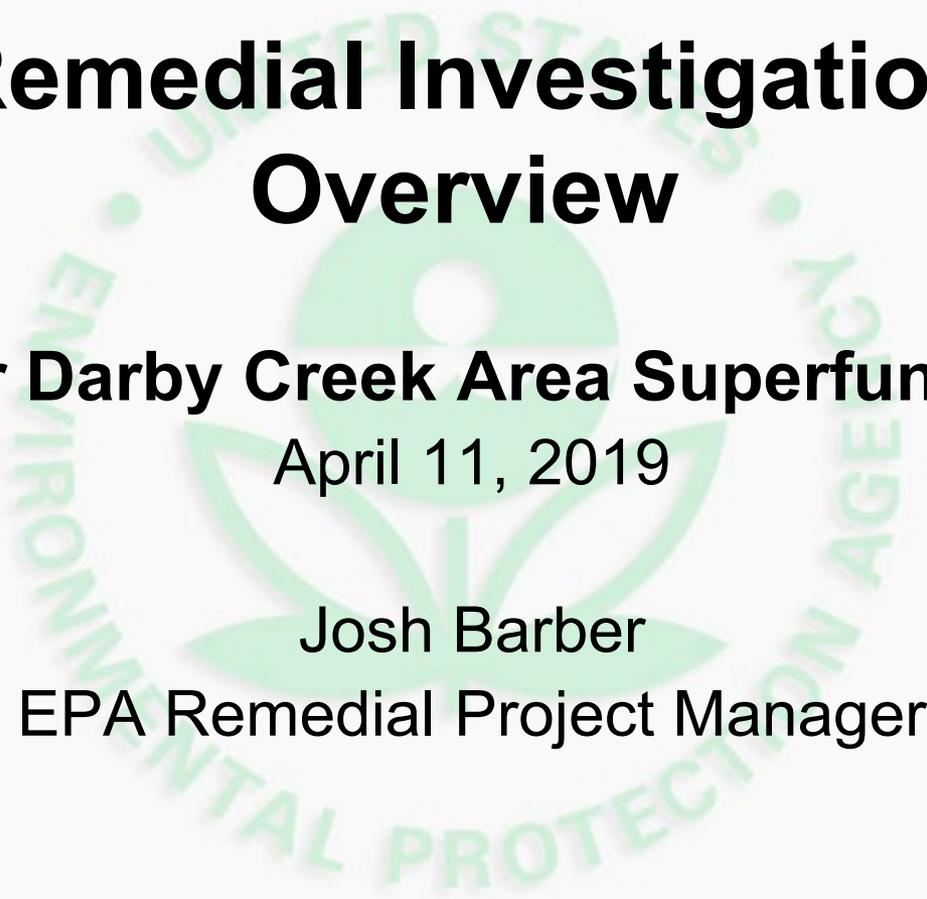
Folcroft Landfill OU2 Remedial Investigation Overview

Lower Darby Creek Area Superfund Site

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Introductions



Superfund Process Overview

and

Folcroft Landfill Background



Origin of CERCLA



- 1970s – Congress & public awareness of chemical spills, abandoned dump site and hazardous waste problems grow
 - Love Canal, NY
 - Valley of the Drums, KY
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)



Key Provisions of CERCLA



- Removal, Remedial and Enforcement Actions
- Hazardous Substance Trust Fund (“Superfund”)
- Potentially Responsible Party (PRP) Liability
- National Priorities List (NPL)
 - Highest priority sites
 - Eligible for Superfund money
- Community Involvement is a requirement

The Superfund Process



OU1

THE SUPERFUND REMEDIAL PROCESS

Assessment



Discovery of Contamination

Preliminary Assessment

Site Inspection

National Priorities List (NPL) Site Listing

Characterization



Remedial Investigation/ Feasibility Study & Proposed Plan

Selection of Remedy



Record of Decision

Cleanup



Remedial Design



Remedial Action

Post-Construction



Operation and Maintenance



NPL Deletion

Five-Year Reviews

Community involvement and planning for a site's redevelopment are integral to the entire process

OU2
OU3

Community Involvement Resources



- Community Involvement Plan
- Technical Assistance Grant (TAG)
 - Darby Creek Valley Association
- Technical Assistance Services for Communities Program (TASC)
 - Contract has been used for technical expertise
- Community Advisory Group (CAG)
 - Eastwick Lower Darby Creek Area CAG

EPA Community Involvement



- Public involvement allows for a two-way conversation to occur
- Community input is essential in cleanups
- Site information can be found at www.epa.gov/superfund/lowerdarby

Lower Darby Creek Area (LDCA) Superfund Site



- Clearview Landfill (LF) and Folcroft Landfill and Annex
- Folcroft LF and Annex in John Heinz NWR (OU2)
- Clearview LF 2 miles upstream of Folcroft LF and Annex
 - OU1 – Soil and Waste
 - OU3 – Groundwater



The "Site" is wherever contamination has come to be located

Folcroft Landfill and Annex – History



- Former wetland
- Unpermitted disposal from the 1950s to 1970s of municipal, industrial, hospital wastes, incinerator ash, and sewage sludge
- Landfill expanded from 0.25 acres in 1953 to 46 acres by early 1970s.

Historical Aerial Photographs



1937



1953



1965



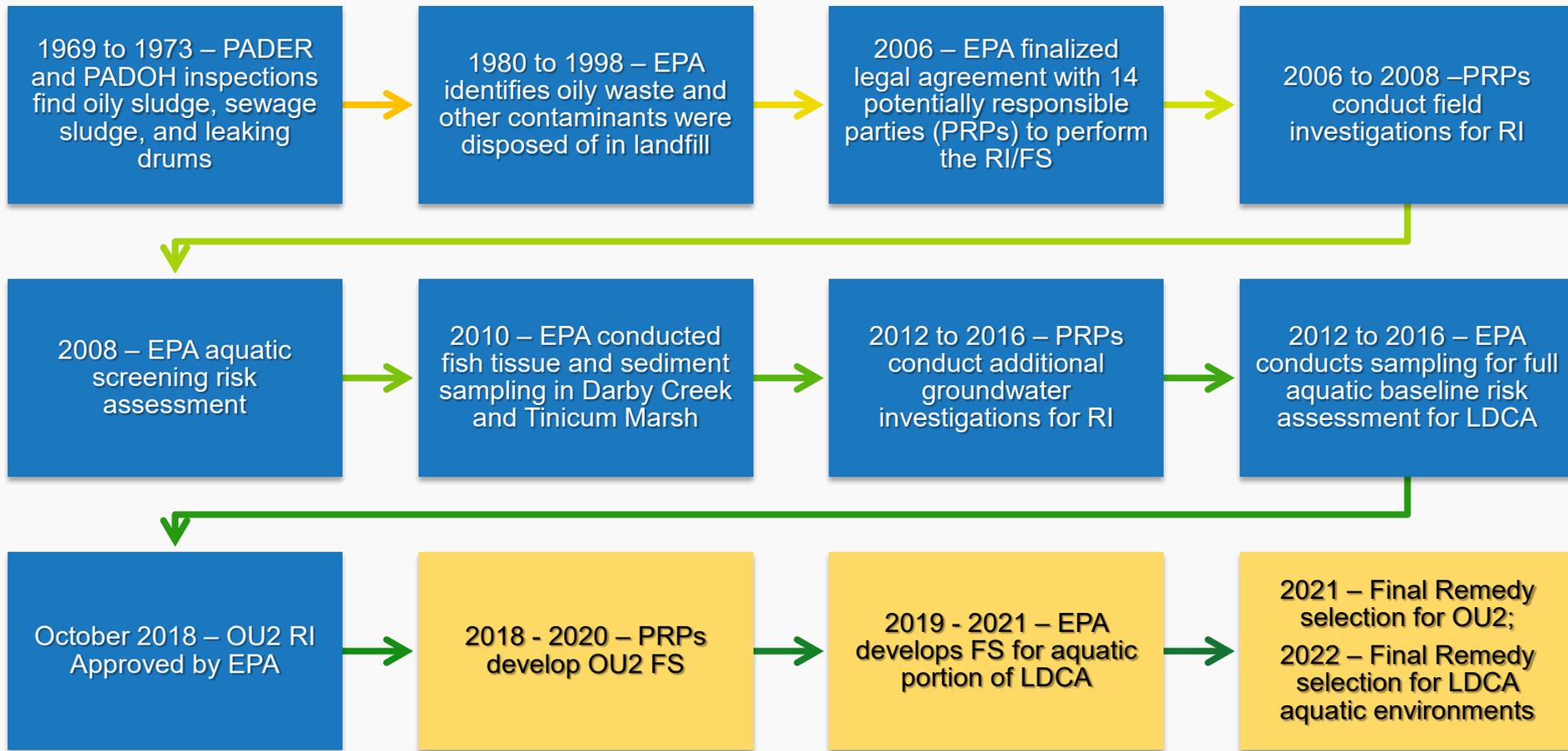
1971

Folcroft Landfill and Annex – History



- Commonwealth of PA ordered that Folcroft Landfill operations be terminated and the landfill be closed in 1973 due to permit violations and improper management
- Landfill operations ceased in 1974 and closure operations commenced including the placement of a soil cover (2-10 feet thick)
- Department of Interior acquired the 62-acre Folcroft Landfill and Annex in 1980 and the U.S. Fish and Wildlife Service assumed management
- LDCA listed on National Priorities List in 2001

Folcroft Landfill and Annex - History & Schedule



A large, faint watermark of the Environmental Protection Agency (EPA) logo is centered in the background. The logo consists of a circular border containing the text "UNITED STATES" at the top and "ENVIRONMENTAL PROTECTION AGENCY" at the bottom. In the center of the circle is a stylized flower with three leaves and a circular head.

Folcroft Remedial Investigation Findings

Folcroft Landfill and Annex - Remedial Investigations



Terrestrial Investigation (complete) – focusing on the Folcroft Landfill and Annex

- Evaluated nature and extent of contamination at the site
- Evaluated whether contamination had migrated offsite
- Determined if contamination from the Site posed onsite threats to public health and/or the environment

Terrestrial Investigation – Summary of Activities



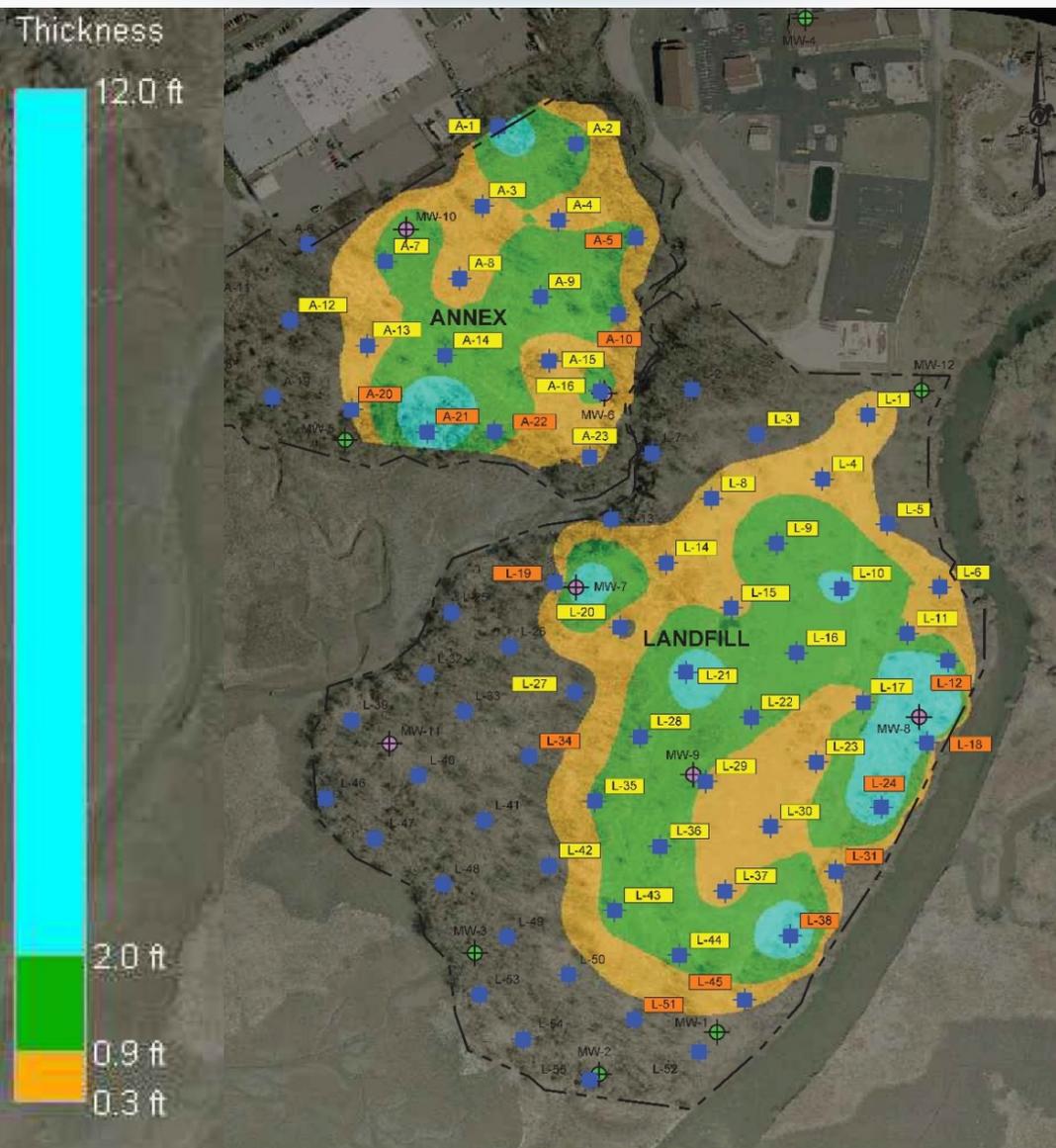
- Soil Investigation
 - Condition and thickness of soil cover
 - 54 soil borings; 177 surface and subsurface soil samples
- Intertidal Seep Investigation
 - Collection of 7 seep samples (soil/aqueous)
- Landfill Gas/Ambient Air Investigation
- Groundwater Investigations (Initial and Off-site)
 - Initial: 6 new and 6 existing monitoring shallow monitoring wells
 - Off-Site: 14 new shallow and 3 bedrock monitoring wells

Terrestrial Investigation – Results



Soil Investigation - Condition and thickness of cap

- Topsoil, silt, clay, gravel with some areas showing waste/debris at surface
- Thickness of the soil cover ranges from a few inches to 12 feet thick.
- Approximately 30% of the surface has at least a 1-foot thick cover (mainly in center portions of both properties)



Terrestrial Investigation – Results



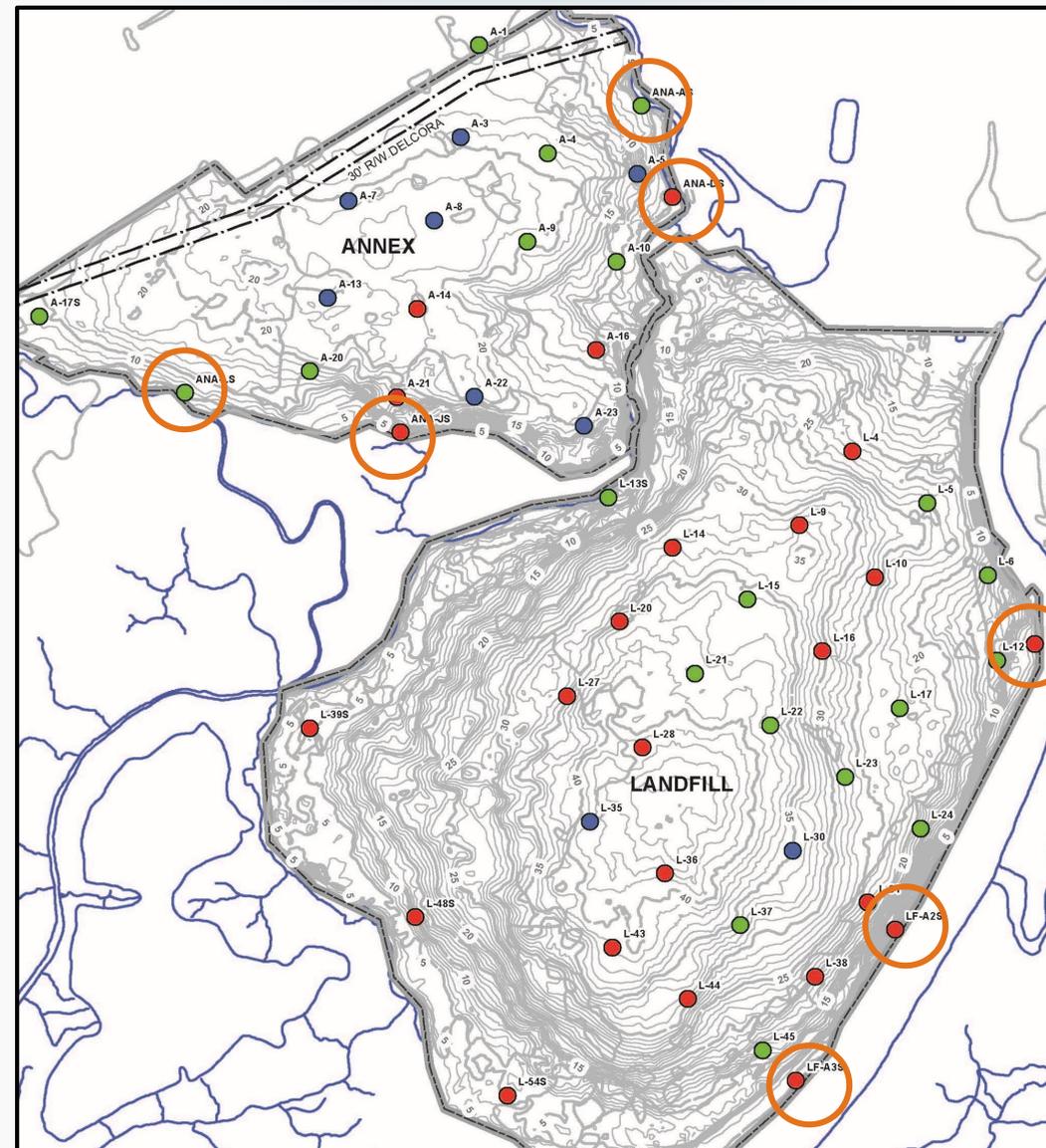
Sampling Locations and Results

This map shows sampling locations for soil, landfill gas and seeps.

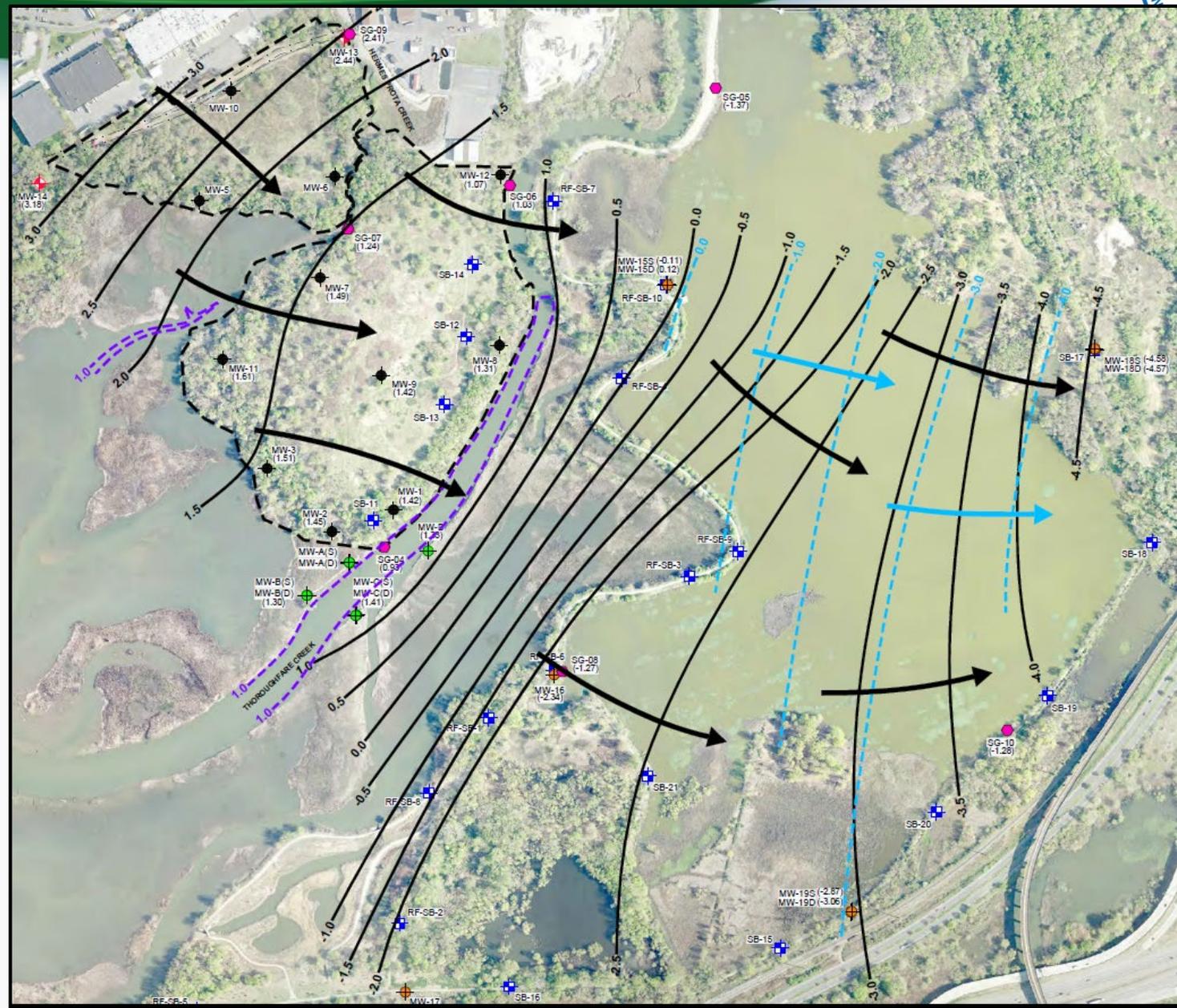
It also shows the concentrations that were found for one class of contaminant, semi-volatile organic compounds (SVOCs), and how they compare to EPA screening levels.

-  Not detected
-  At or below screening level
-  Exceeds screening level

-  Seep sample location (water and sediment)



Groundwater Flow Direction



Terrestrial Investigation – Results



Groundwater Investigation Results

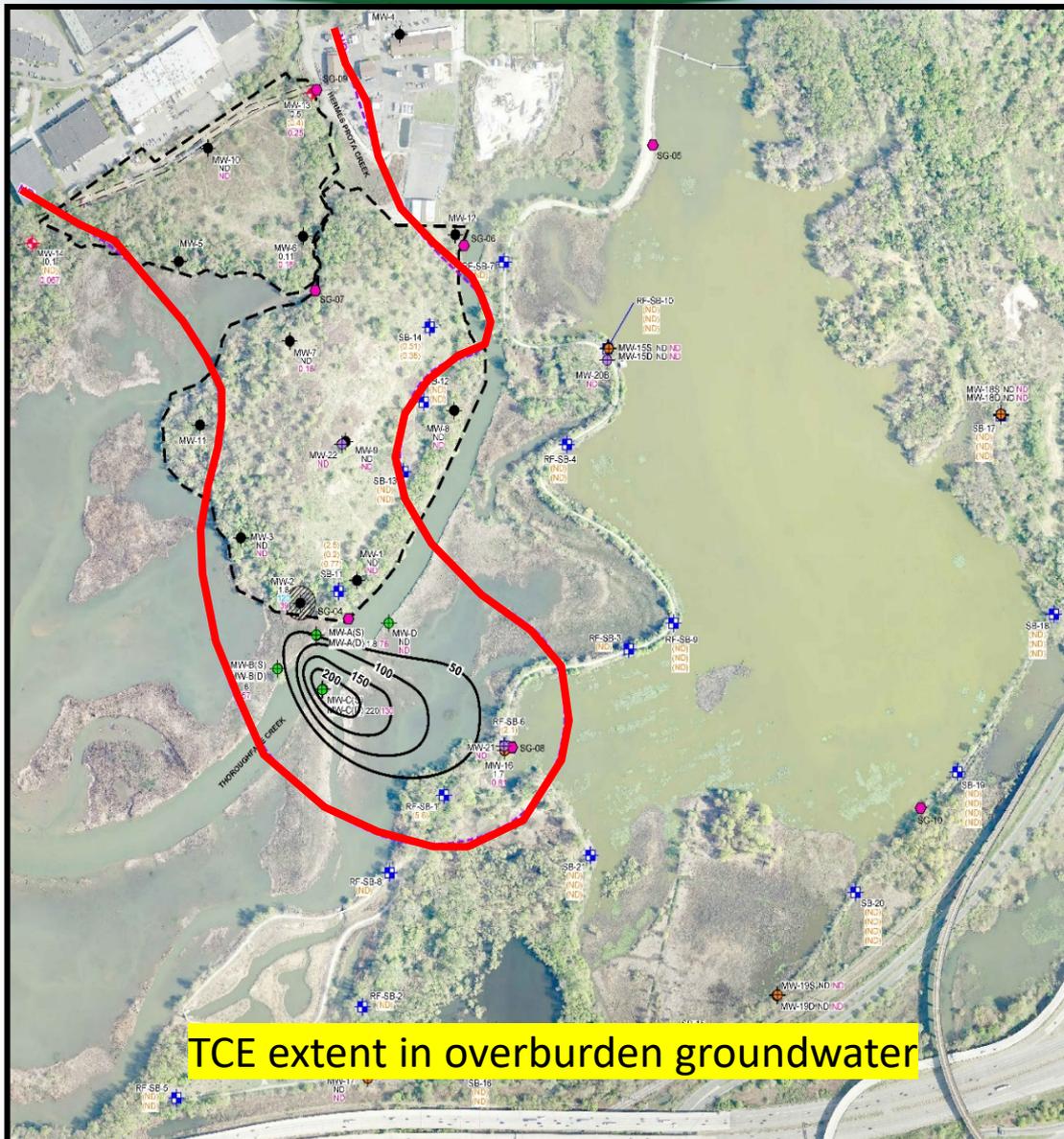
This map shows the extent of groundwater contamination for the contaminant Trichloroethene (TCE).

This groundwater contamination is present in the layers of sand, silt and gravel on top of the deeper bedrock.

Groundwater contamination does not discharge to surface water anywhere in the Refuge or beyond.

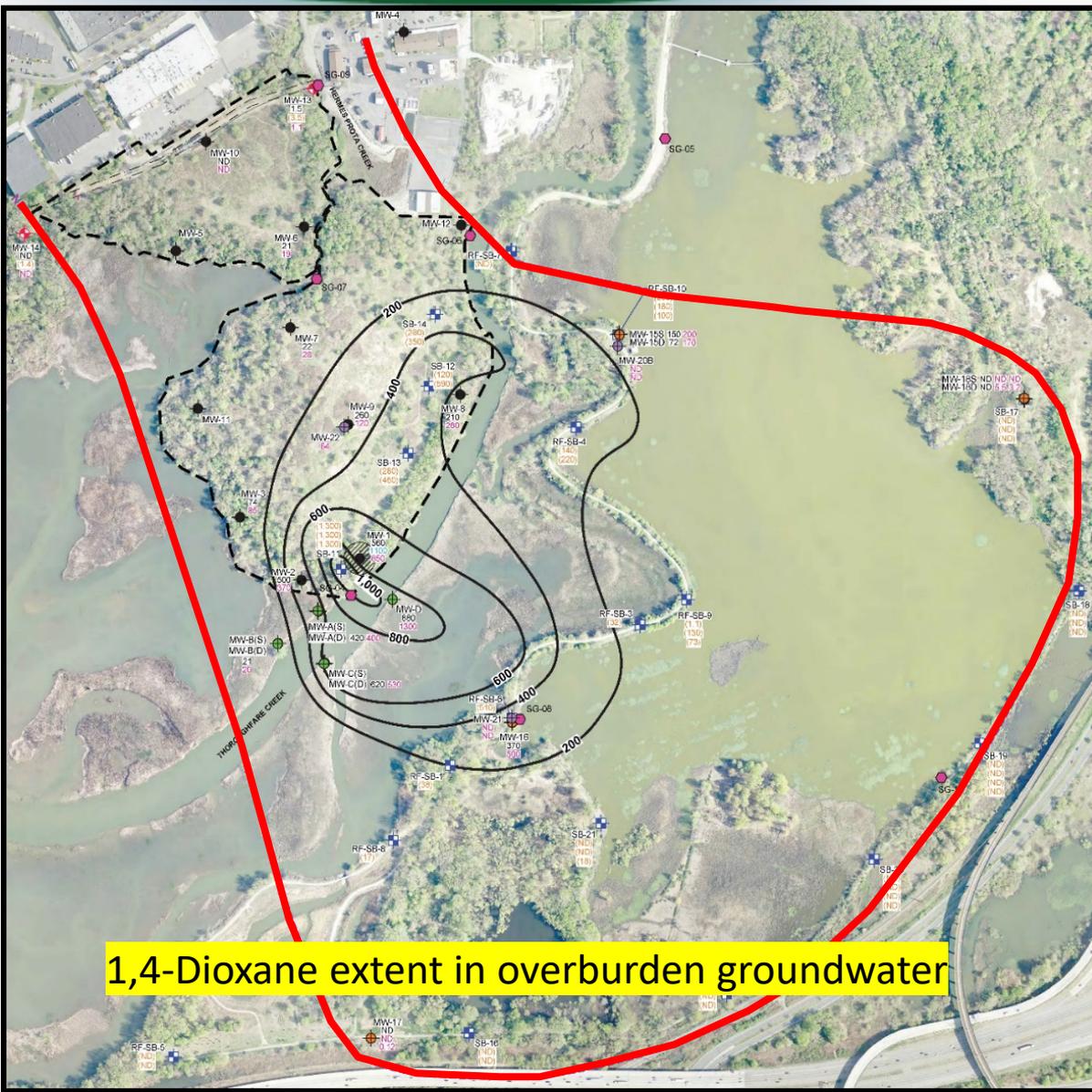
The red line represents the approximate edge of where TCE was detected.

The federal drinking water standard for TCE is 5 parts per billion. Most of the TCE contamination is higher than that value.



TCE extent in overburden groundwater

Terrestrial Investigation – Results



Groundwater Investigation Results

This map shows the extent of groundwater contamination for the contaminant 1,4-dioxane.

This groundwater contamination is also in material on top of bedrock.

Groundwater contamination does not discharge to surface water anywhere in the Refuge or beyond.

The red line represents the approximate edge of where 1,4-dioxane was detected.

There is no federal drinking water standard for 1,4-dioxane. PA uses a value of 6.4 ppb, and, most of the 1,4-dioxane contamination is higher than that value.

Superfund Human Health Risk Assessments



- A Superfund risk assessment calculates potential risk from exposure to Site contaminants and how much they can:
 - Increase chances of getting cancer over a lifetime

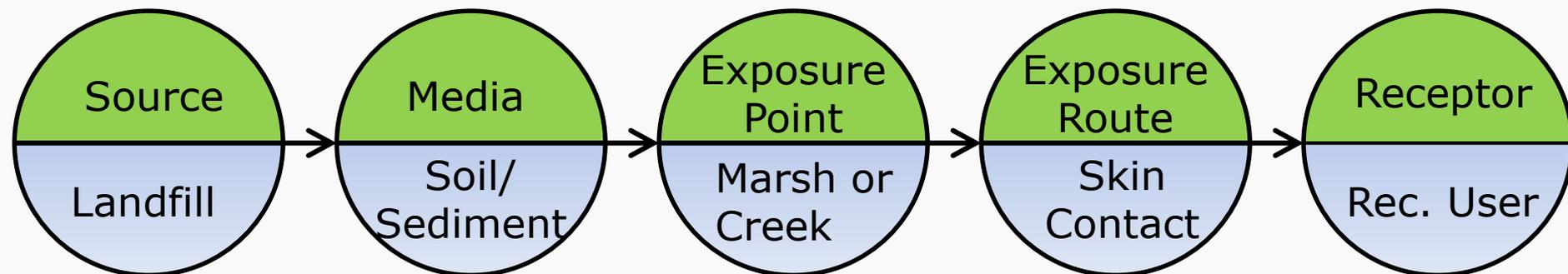
OR

- Increase chances of someone experiencing a non-cancer negative health effects on the body's organs or functions.
- EPA's allowable range for increased potential cases of cancer from lifetime exposure to contaminants is *one-in-ten-thousand* to *one-in-one-million*.



Potential Exposure to Contaminants

- The presence of a contaminant in the environment alone, does not present a health risk.
- Potential increased risks are the result of people or wildlife regularly coming into contact with contaminants at toxic levels for long periods of time.



Terrestrial Investigation

Human Health Risk Assessment



- The objective of a Superfund Human Health Risk Assessment (HHRA) is to identify chemicals of potential concern (COPCs) that present potential unacceptable risks now or in the future.
- The OU2 HHRA considered direct exposure to contaminants in soil, seeps, shallow groundwater (in a trench) and indoor air in hypothetical future building located over the contaminated groundwater for the following Site users:
 - Construction/Excavation Workers
 - Maintenance /Refuge Workers
 - Adolescent Trespassers
 - Adult and Child Refuge Visitors

Terrestrial Investigation

Human Health Risk Assessment



- One contaminant, **vinyl chloride**, was found to be COPC with a future potential unacceptable risk in a hypothetical future building over the contaminated groundwater.

- NO SUCH BUILDING CURRENTLY EXISTS

- The Feasibility Study will address this risk and evaluate potential risks from future residential use of the groundwater.

Terrestrial Investigation

Screening Level Ecological Risk Assessment



- The objective of a Superfund Screening Level Ecological Risk Assessment (SLERA) is to identify chemicals of potential ecological concern (COPECs).
- There is potential for adverse effects to plants and invertebrates on both the Landfill and the Annex from several metals, pesticides and semi-volatile organic compounds; dioxins are also COPECs for the Annex.
- Potential for adverse effects through the food chain are greatest for birds and mammals that feed largely on insects:

Receptor	COPECs
Short-Tailed Shrew	bis(2-ethylhexyl)phthalate, aluminum, dioxins, copper, nickel
American Robin	copper, endrin aldehyde, endrin, nickel
American Woodcock	endrin aldehyde, endrin, copper, lead

- Potential ecological risks from the Landfill and Annex will be addressed during the FS.

Folcroft Landfill RI Report



Full OU2 RI Report available at:

Report:

<https://semspub.epa.gov/work/03/2265189.pdf>

Appendices:

<https://semspub.epa.gov/src/document/03/2267753>

Next Steps – Folcroft Landfill

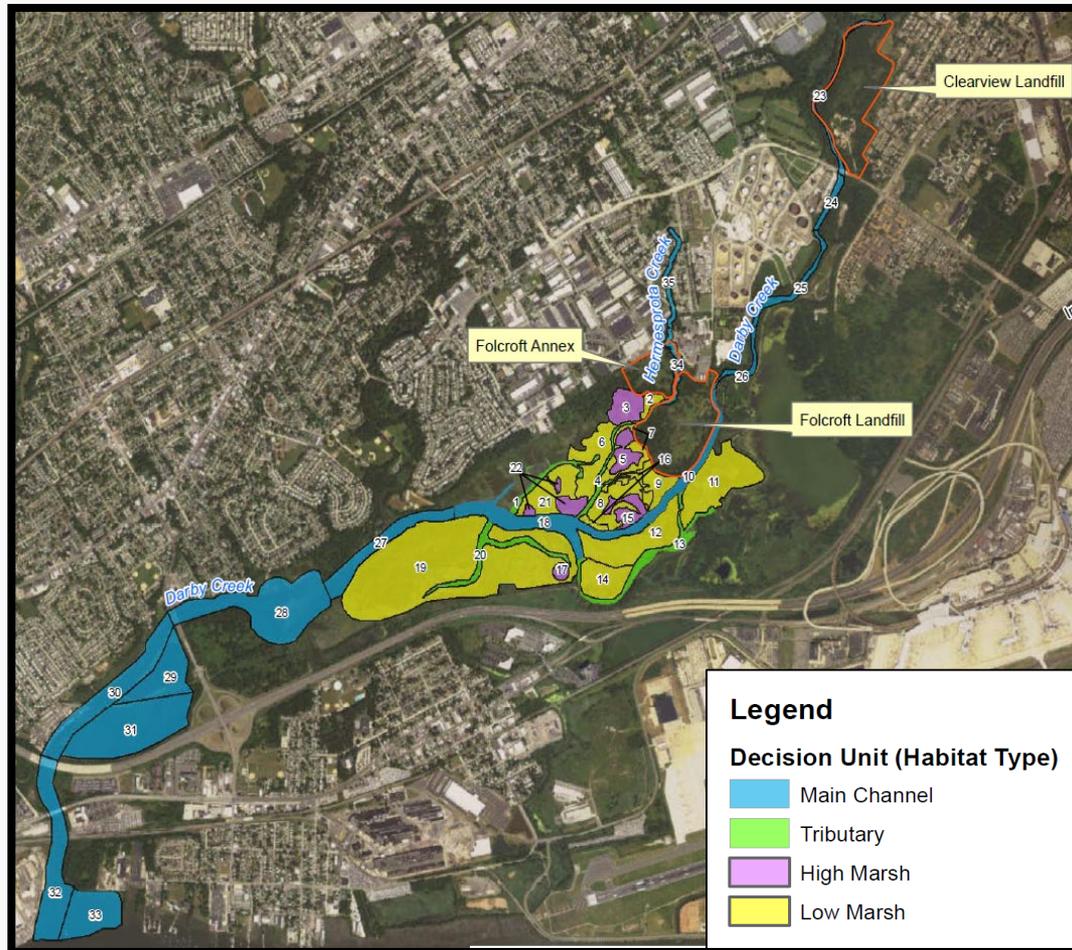


- EPA, U.S. Fish & Wildlife Service (USFWS) and Pennsylvania Department of Environmental Protection (PADEP) staff have held several meetings with the Folcroft Potentially Responsible Parties (PRPs) to determine the scope of the Feasibility Study (FS).
- The draft framework for the FS was submitted in late 2018 and the development of the FS will continue throughout 2021 and 2020.
- As part of the FS, a treatability study is being conducted in 2019 to evaluate different potential treatment options for groundwater. The plan for this study is currently being reviewed by EPA.
- After the FS is complete, EPA will develop a Proposed Plan outlining the preferred cleanup approach for OU2. This Plan will go out for public comment and there will be a public meeting to present the cleanup approach and solicit public comments.
- After the Proposed Plan, a Record of Decision will be developed by EPA. The Proposed Plan/Record of Decision process usually takes at least 12 months.



EPA LDCA
Baseline Aquatic Risk Assessment

Folcroft Landfill and Annex - EPA Aquatic Risk Assessment



Aquatic Investigation (ongoing) – focusing on the several water bodies with the boundaries of the Site, including Darby Creek, Cobbs Creek, Hermesprotta Creek, Muckinpattis Creek, and Tinicum Marsh

- Evaluating the nature and extent of contamination in the aquatic system
- Determining if contamination from the aquatic system poses threats to Refuge workers, visitors, fisherman and/or the environment

EPA Aquatic Investigation – Summary of Activities



- A Screening Level Ecological Risk Assessment (SLERA) was completed in 2008 and identified numerous potential contaminants that presented potential risks including metals, polycyclic aromatic hydrocarbons (PAHs), pesticides, dioxins/furan and polychlorinated biphenyls (PCBs).
- EPA collected fish tissue for testing in 2010 from throughout the LDCA Site.
- Between 2012 to 2016, EPA collected shallow and deep sediment samples, turtle tissue samples, conducted various tests to evaluate toxicity of sediment and collected data to help understand the movement of contaminants throughout the LDCA Site.
- Data Report is available at: <https://semspub.epa.gov/work/03/2235207.pdf>
- The Aquatic Baseline Risk Assessment Report should be complete in early 2019 and includes a full
 - Human Health Risk Assessment
 - Ecological Risk Assessment
 - Nature and Extent Evaluation

Next Steps – Aquatic



- EPA will finalize the Aquatic Risk Assessment Report in mid-2019 and can host a public meeting to present the findings if there is public interest.
- The Feasibility Study to address LDCA aquatic risks will begin in 2019. This will be a highly complex FS and as such will take longer than a typical FS, which is 9-12 months.
- EPA Region 3 is currently working with the EPA Office of Research and Development on a research project looking at the movement of contaminants during large storm events (100 and 500 year floods).
- Additional research may follow this and the hope is that it will be helpful in evaluating cleanup options as part of the Aquatic FS.

Questions???

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