

Spirit Lake Project Update:

May 19, 2022 Public Meeting



Meeting Snapshot

Welcome!

- **Partnerships, GLRI and the Great Lakes Legacy Act**
- **Project Overview**
 - Why is the clean-up necessary?
 - Who is conducting the work?
 - Discussion of final design
 - Why was the redesign necessary?
 - How does the redesign differ?



- **How is the cleanup occurring?**
 - Project details
 - What work has been completed so far?
 - Project timeline
- **What is next?**
 - Potential Impacts and Benefits
 - Long-term monitoring
 - What will the site look like after the project is completed?

Overview of GLRI and GLLA

- [St. Louis River Area of Concern](#) – work under the Great Lakes Area of Concern program is foundational to addressing ecological and environmental impairments in the St. Louis River system. The AOC program; jointly executed through Federal, State, and local partnerships works to address a variety of beneficial use impairments (BUIs).
- Completing large-scale remediation and restoration projects is a key catalyst in making progress to remove BUIs in the Area of Concern. The Spirit Lake Great Lakes Legacy Act project is the largest remediation project in the AOC and will help improve several BUIs.
- Spirit Lake is one of many sites within the larger AOC where contaminants need to be addressed, some of those projects are on-going or soon to start.
- [Great Lakes Restoration Initiative \(GLRI\)](#) – The GLRI authorizes and provides federal funding to accelerate efforts to protect and restore the Great Lakes.
- [Great Lakes Legacy Act \(GLLA\)](#)- The GLLA is a voluntary cost-share program used to accelerate remediation of contaminated sediments in AOCs. Contaminated sediments remain major drivers for several BUIs, including here in the St. Louis River.

Great Lakes Restoration Initiative (GLRI)

- Since its inception in 2010, GLRI has provided funding to 16 federal organizations to strategically target the biggest threats to the Great Lakes ecosystem and to accelerate progress toward achieving long term goals.
- GLRI provides federal funding to the 31 U.S. Areas of Concern (AOCs) across the Great Lakes Basin.
- Along with previously awarded GLRI funds, Bipartisan Infrastructure Law funding will support the federal portion of this remediation. The remainder of impacted areas at the site will be addressed later under Superfund or State programs where necessary.



Great Lakes Legacy Act (GLLA)

- Contaminated sediments are a primary driver to several beneficial use impairments in Great Lakes Areas of Concern (AOCs) – including the St. Louis River Area of Concern.
- GLLA allows habitat restoration work to be done in conjunction with sediment remediation.
- GLLA leverages cost-share (cash and in-kind) from nonfederal sponsors [States, Municipalities, Industries, NGOs], using a Project Agreement to outline responsibilities of the parties.
- It requires NFS's to contribute a minimum 35% match of the total project costs.
- The program relies heavily on partnerships not only from nonfederal sponsors but also partnering agencies and stakeholders at Federal, State, and local levels.
- For Spirit Lake these stakeholders are organized into a Project Coordination Team (PCT). The PCT is charged with reaching consensus on the remedial approach and restoration efforts necessary for the GLLA project as well as aiding in its successful completion.

Spirit Lake Project partners

- U. S. Steel
- City of Duluth
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- Fond du Lac Band of Lake Superior Chippewa
- Lake Superior Mississippi Railroad
- Illinois-Indiana Sea Grant
- Army Corps of Engineers



Spirit Lake Great Lakes Legacy Act Project Agreement

Spirit Lake GLLA Project Agreement - Total Costs						
Phase		USS Est. Budget	USEPA Est. Budget	Overall		Required NFS Match
RI/FS/RD		\$ 10,000,000	\$ 11,500,000	\$ 21,500,000		35%
TOTAL RA		\$ 84,150,000	\$ 80,850,000	\$ 165,000,000		51%
TOTAL PROJECT		\$ 94,150,000	\$ 92,350,000	\$ 186,500,000		

- U. S. Steel is the nonfederal sponsor (NFS) for this project. EPA and U. S. Steel have a voluntary Great Lakes Legacy Act Project Agreement in place for remedial activities at the Spirit Lake site.
- The total cost for remediation in the GLLA Project Agreement between U. S. Steel and EPA is \$165M. More costs are also included for Remedial Investigation (RI), Feasibility Study (FS) and Remedial Design (RD). All of those combined is \$186.5M.
- Note: the original price for remediation was \$75M as of 2018. A variety of factors caused the remediation to be more expensive. Both parties agreed to increase the price in the agreement to \$165M to complete the remediation and restoration work at the Legacy Act site.

Why is the Spirit Lake GLLA project being done?

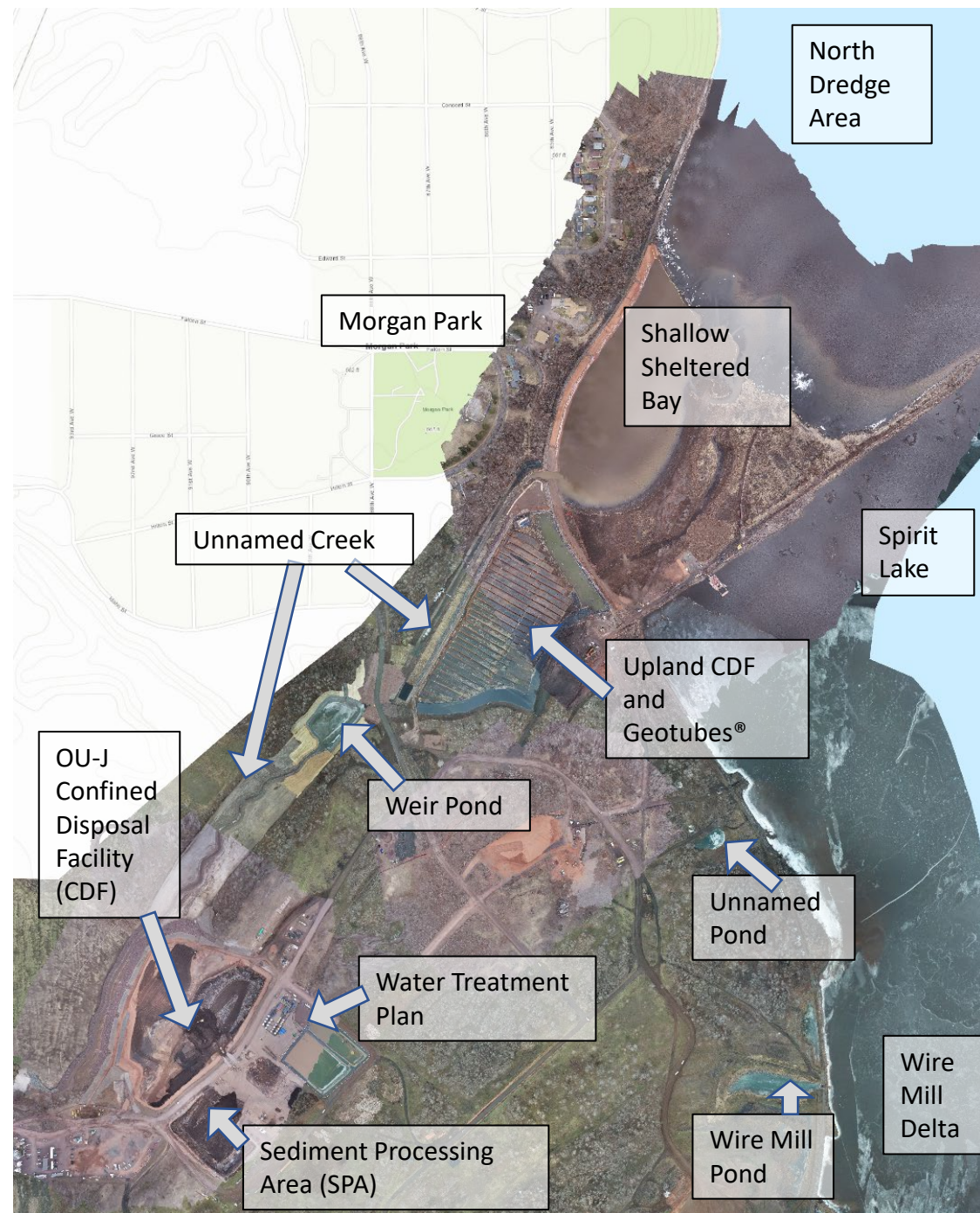
- This project is critical to the St. Louis River Area of Concern. Remediation of impacted areas and creation of habitat is necessary to address beneficial use impairments.
- This is a voluntary project between U.S. EPA's Great Lakes National Program Office and U. S. Steel. The GLLA program is allowing for these portions of the site to be cleaned up faster than other authorities.
- Former operations at the U. S. Steel Duluth Works created impacts to sediments in the St Louis River, as well as adjacent wetlands and upland areas. Other sources upstream of the site also caused impacts in the Spirit Lake area.
- The GLLA project is only focusing on areas of the site that are identified in the remediation figures. This includes some areas on land, but a majority of the project takes place in Spirit Lake, adjacent to the former steel plant.
- Significant habitat restoration and enhancement is made possible because of this project
- Completing this cleanup also provides the opportunity to increase recreational opportunities and improve access to the waterfront in this area.

Who is conducting the work?

- The remediation work is being jointly executed by EPA's Great Lakes National Program Office (GLNPO) and U. S. Steel.
- EPA and U. S. Steel both have contractors working on the project. The project was competitively bid through the respective entity's competitive processes.
- EPA is conducting the work through federal contracts:
 - **RAC III** (Remedial Action Contract)
 - **GLNPO-RRS** (GLNPO Remediation and Restoration Services Contract)
 - **GLAES II** (Great Lakes Architecture and Engineering Services Contract II)
- Major remediation and restoration contractors performing work for EPA and U. S. Steel under the above contracts:
 - EA Engineering, Science, and Technology, Inc., PBC (EA)
 - JF Brennan
 - Frattalone
 - Cardno
 - Barr Engineering
 - AECOM

Major site features

- Features shown reflect most of the remediation areas that we will discuss in this presentation
- The unnamed creek flows from bottom-left to top-right. The remediation work followed a similar route with the first phases starting in the upper reaches of Unnamed Creek and working out into Shallow Sheltered Bay and Spirit Lake.
- A key area to note is the Shallow Sheltered Bay which is a large bay excavated out of the former mudflat to create new open-water fish spawning habitat.
- Any water encumbered from operations or site activities is collected and treated at the on-site water treatment plant, and treated before being discharged back to the river.

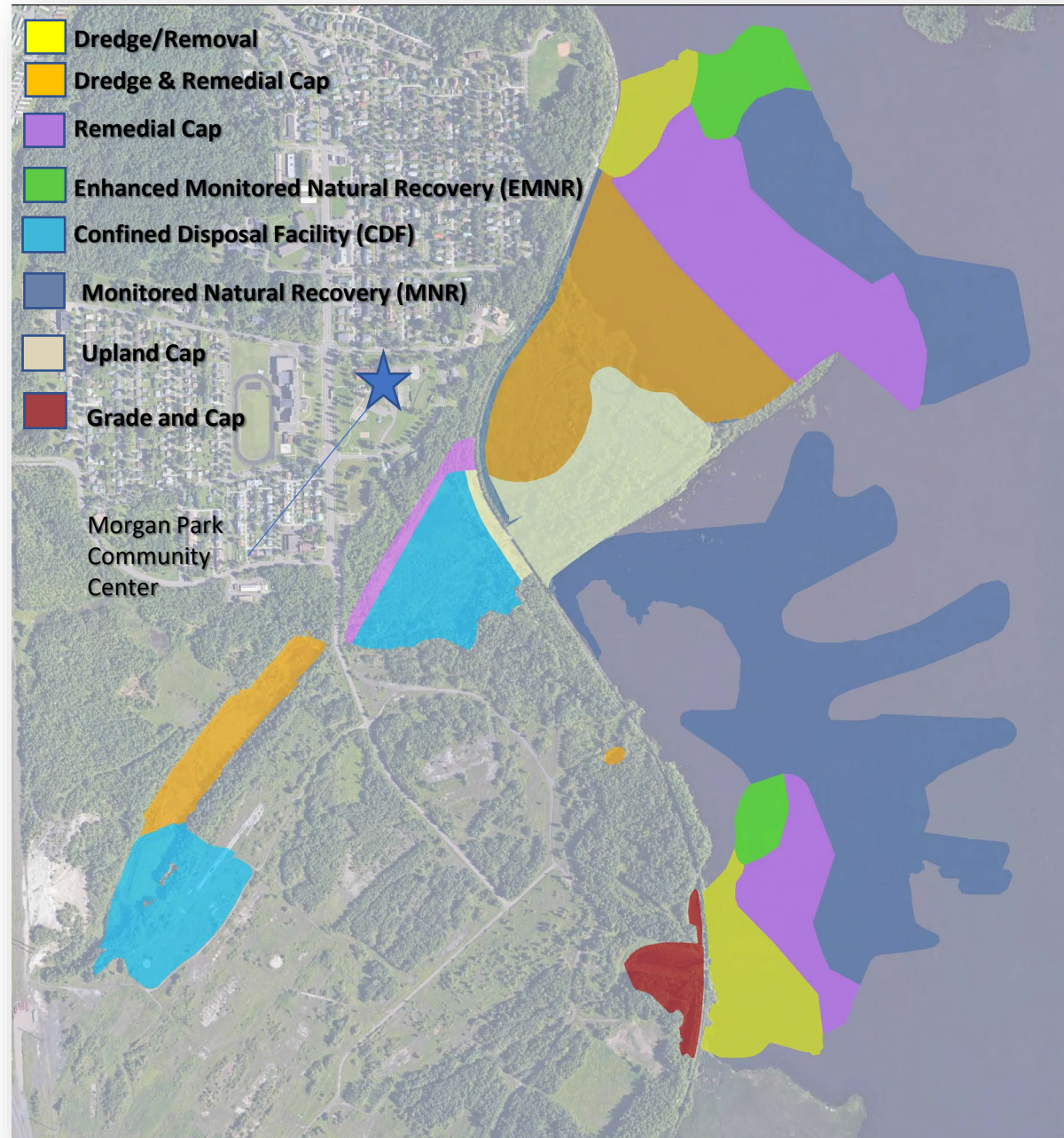


What is the approach to remediating the GLLA project areas?

- **Dig it up, put it in a CDF** - Mass removal of impacted materials (dredging and excavation), which is then placed into 2 on-site confined disposal facilities (CDFs). CDFs will have an encapsulating protective cap over the top after filled and finished.
- **Put a protective cap over it** - Protective caps/remedial caps are placed over large areas of the project. These caps are designed to limit the mobility and availability of contaminants that may remain. A bioactive zone of clean sand is on top of the cap to help enhance recolonization and restoration of native plants and biota.
- **Combinations of dredging and capping** are used in several areas.
- **Thin layer cover** over lower-level surface impacts. Enhanced monitored natural recovery (EMNR) will be used in some areas with lower-level surface impacts. EMNR consists of a thin layer cover of clean sand, which accelerates recovery of the abiotic system.
- **Monitor the site** - Conducting long-term monitoring, including Enhanced Monitored Natural Recovery (EMNR) and Monitored Natural Recover (MNR).
- **Restore and enhance native habitat** - Habitat restoration is taking place over a large portion of the project footprints where activities are occurring. The target for these restoration efforts was to create a mosaic of different types of habitat the provide a broad range of ecological functions – from upland native plants to emergent marshes to deeper water habitats

Spirit Lake GLLA Project

- 1.3 million cubic yards remediated. Dredge/removal of 460,000 cubic yards and capping of 850,000 cubic yards within the estuary and Unnamed Creek
- 96 acres capping within the estuary and Unnamed Creek
- 7 acres EMNR: Enhanced Monitored Natural Recovery (EMNR)
- MNR: Monitored Natural Recover (MNR)
- Two on-site CDFs: create two on-site Confined Disposal Facilities (CDFs) for dredge/excavated materials
- 138 acres restoration: Habitat Restoration as required by applicable permits.



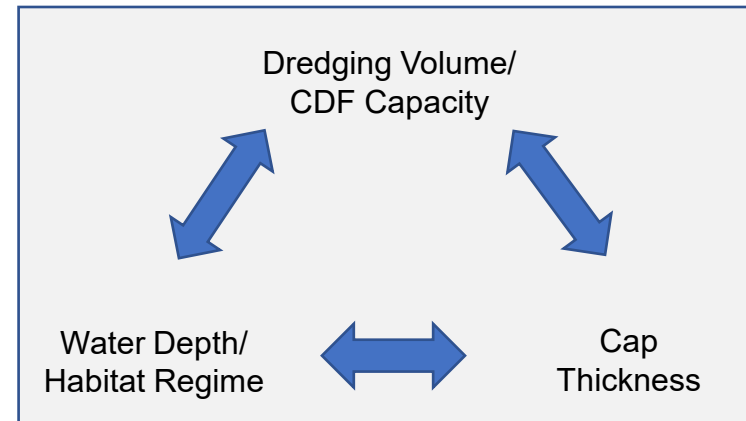
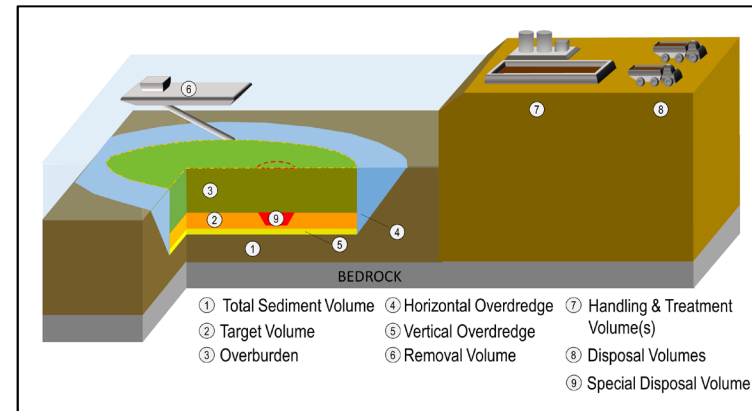
Why was the redesign necessary?

- The project is extremely complex and as such there are many confounding factors that influence cost and implementation.
- Material Mass Balance was a larger driver in understanding how to achieve remedial action objectives while also accommodating redesign needs.
- Installation of a large steel sheet pile wall to create a shallow bay feature was very cost prohibitive.
- Local market economics, availability of large variety of materials, labor and fuel are all major cost factors that evolve quickly and have big “swings” on project costs.
- The redesign specifically focused on maintaining a protective remedy that balanced as many project objectives as possible - to remain inclusive of ecological, environmental remediation, cultural, recreational and financial needs.



Inter-Relatedness of Construction Components

- Remedy and Restoration for Spirit Lake has complex, inter-related components
- Design (and re-design) of one component effects numerous others
- Key inter-relations/dependencies
 - Volume-depth-thickness trade-offs
 - Processing and placement
 - Volume balance
 - Schedule and sequence
- Our collaboration with the PCT and project team was to balance many objectives to reach equitable outcomes to the original design
- Maintaining the execution of a protective remedy that meets goals for remediation and restoration of the site.



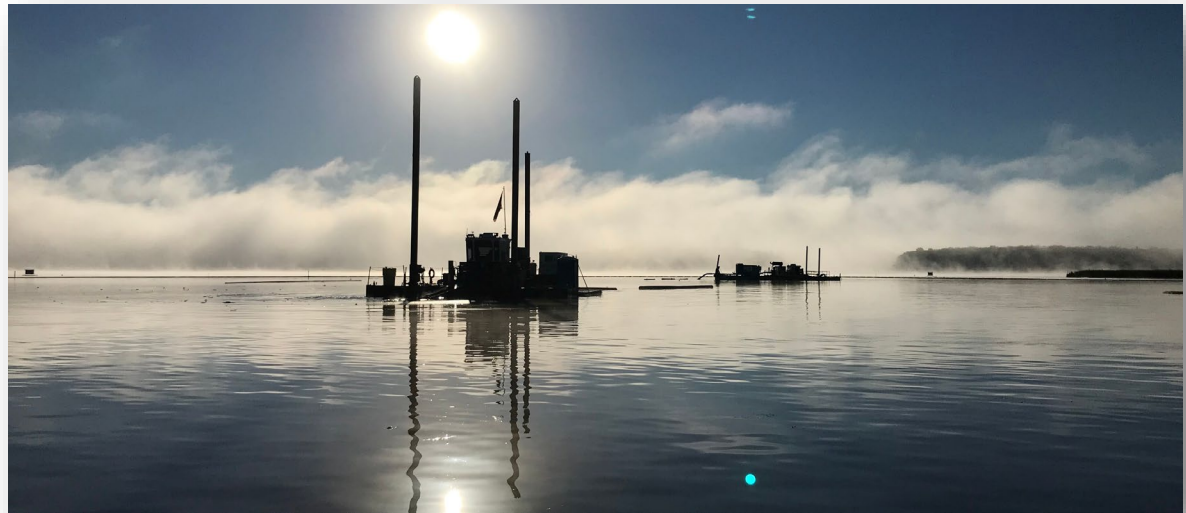
Processing and Placement

- Mechanical dredging, transport and placement is most efficient for drier or frozen material
- Hydraulic dredging – or hydraulic dredging of mechanically dredged material – is most efficient for wetter material
- Value engineering identified that hydraulic placement would be most cost efficient
 - Less rehandling
 - Less amendment
 - Less schedule time



How does the redesign differ?

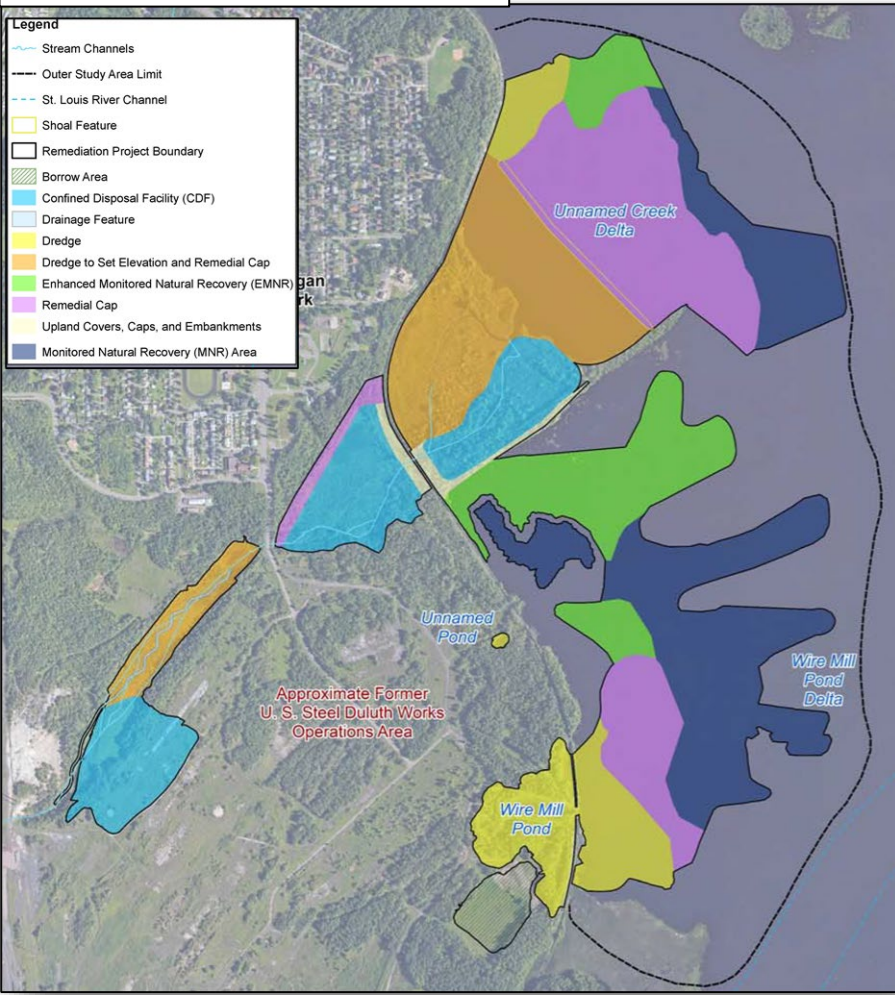
- Disposal:
 - Reductions in removal volumes to eliminate creating the Delta CDF
 - Upland CDF switched to a hydraulic dredge bag field (geotubes) as the most efficient dredge and disposal method for estuary material
 - OU-J CDF volume filled to design capacity
- Changed configuration of the Shallow Sheltered Bay (maintain similar footprint)
- Modified the cap thicknesses to balance needs for material removal, water depth for habitat, and protective and bioactive layers of the caps.
- Optimized remedial footprints through additional analysis and data review



How did the remedial approach change?

2020 ORIGINAL DESIGN

- Legend**
- Stream Channels
 - Outer Study Area Limit
 - St. Louis River Channel
 - Shoal Feature
 - Remediation Project Boundary
 - Borrow Area
 - Confined Disposal Facility (CDF)
 - Drainage Feature
 - Dredge
 - Dredge to Set Elevation and Remedial Cap
 - Enhanced Monitored Natural Recovery (EMNR)
 - Remedial Cap
 - Upland Covers, Caps, and Embankments
 - Monitored Natural Recovery (MNR) Area



REMEDIAL APPROACH

- Hydraulic transport into geotubes, SSB in wet
- Winter excavation of SSB
- Cap modifications
- Trail alignment changes

Changed Configuration

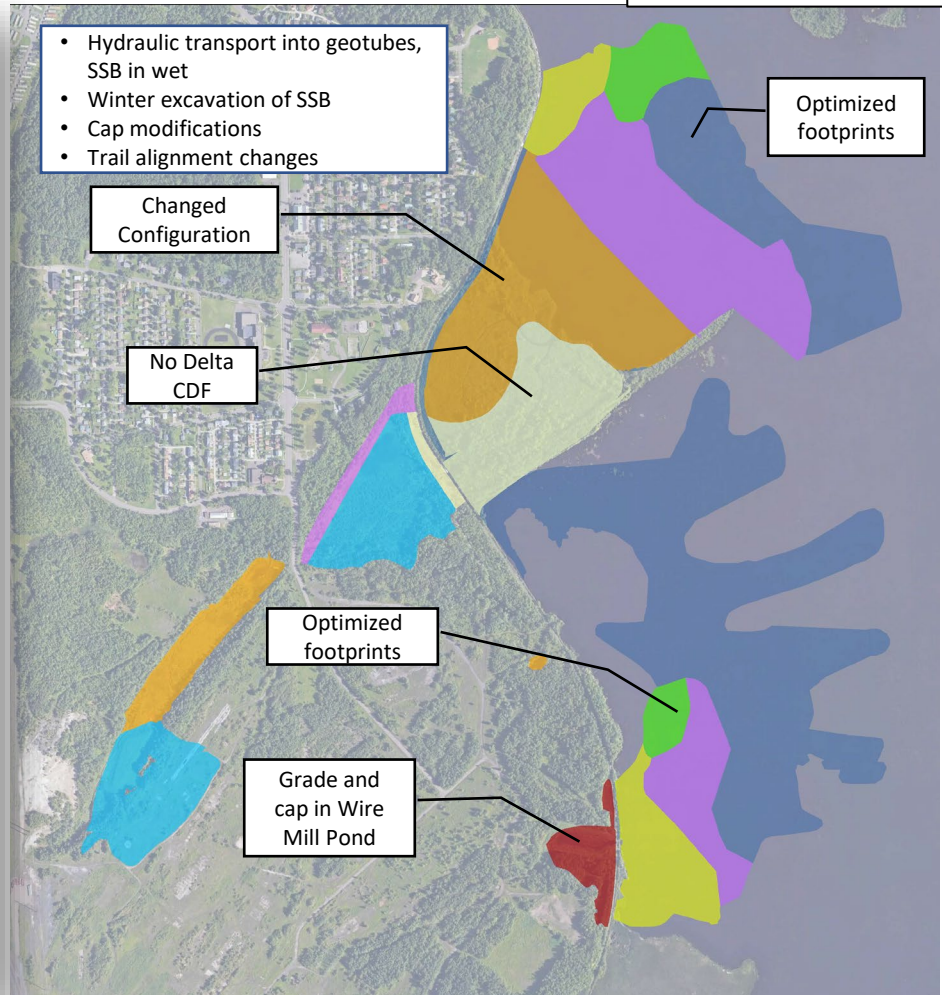
No Delta CDF

Optimized footprints

Grade and cap in Wire Mill Pond

2021 REVISED

Optimized footprints



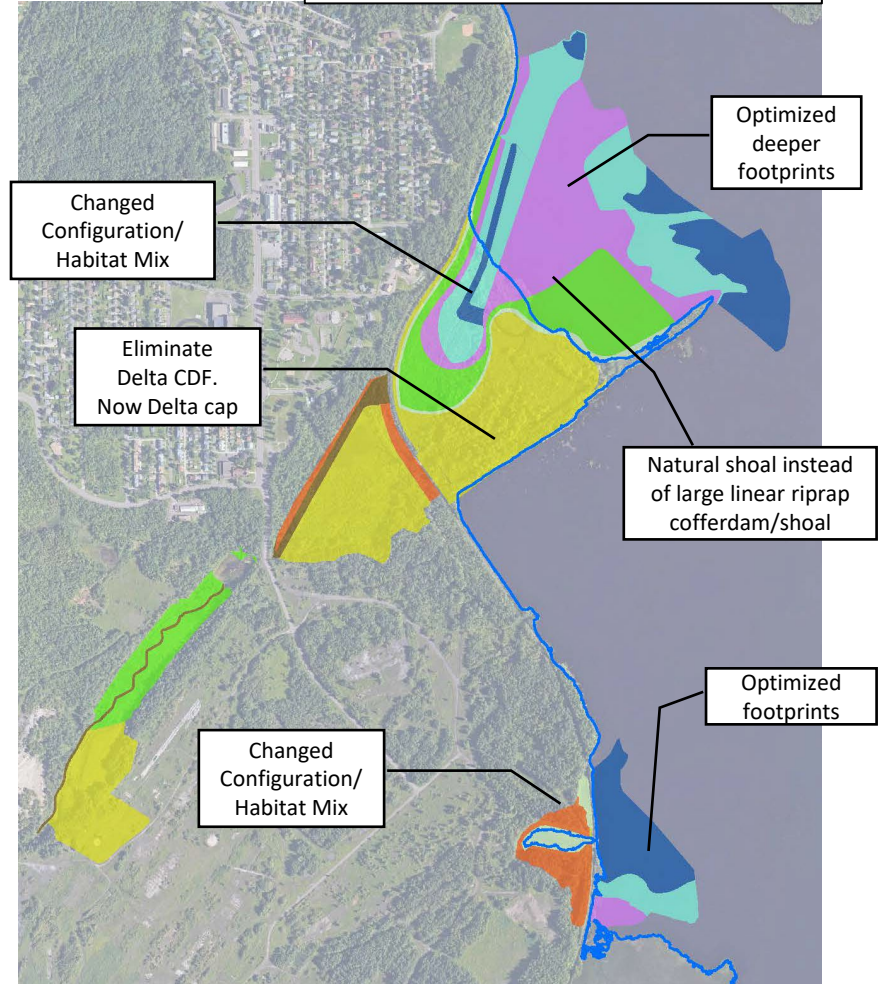
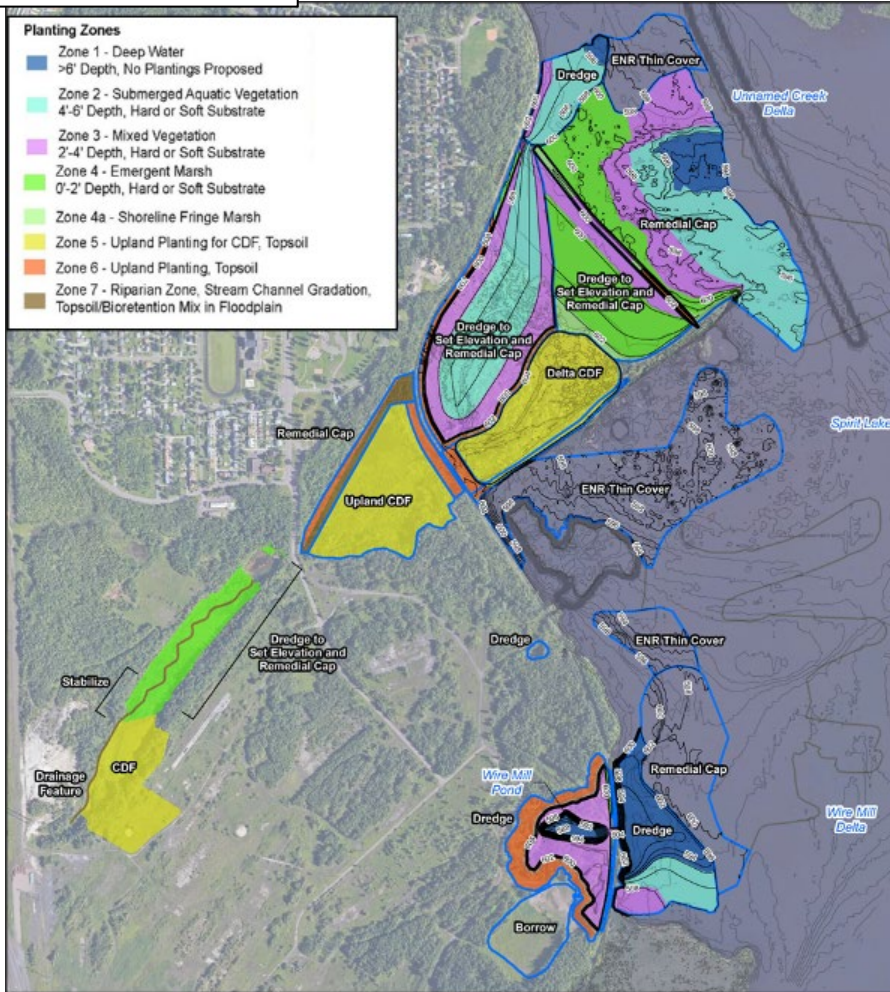
How did the restoration approach change?

2020 DESIGN

HABITAT RESTORATION

2021 REVISED CONCEPT

- Planting Zones**
- Zone 1 - Deep Water
>6' Depth, No Plantings Proposed
 - Zone 2 - Submerged Aquatic Vegetation
4'-6' Depth, Hard or Soft Substrate
 - Zone 3 - Mixed Vegetation
2'-4' Depth, Hard or Soft Substrate
 - Zone 4 - Emergent Marsh
0'-2' Depth, Hard or Soft Substrate
 - Zone 4a - Shoreline Fringe Marsh
 - Zone 5 - Upland Planting for CDF, Topsoil
 - Zone 6 - Upland Planting, Topsoil
 - Zone 7 - Riparian Zone, Stream Channel Gradation,
Topsoil/Bioretention Mix in Floodplain



Work is being done in phases

2020

Phase 1: Upland Work
Mobilization, Unnamed Creek Corridor, OU-J CDF preparation

2021

Phase 2: Dredging in estuary
Upland CDF preparation, hydraulic dredging and residual cover

Winter

“Winter Work” in shallow sheltered bay to address hard substrates. Material placed in Sediment Processing Area (SPA) and OU-J CDF

2022

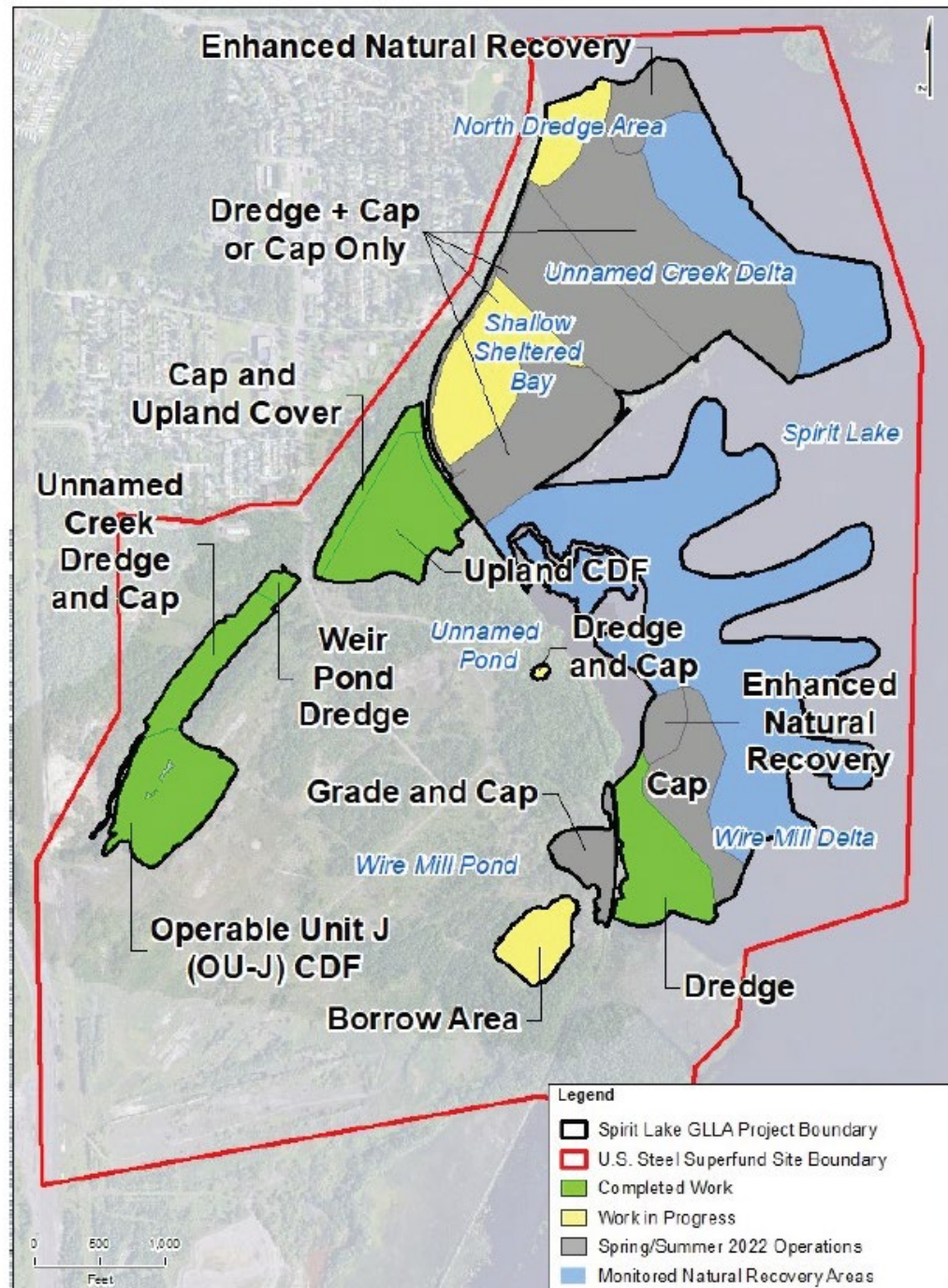
Phase 3: Dredging, capping
Remaining upland work, closure of CDFs

REMEDIATION COMPLETE WINTER 2022/2023

2023

Phase 3: Habitat restoration

ALL WORK COMPLETE 2023



Understanding operations and visualizing the work at Spirit Lake

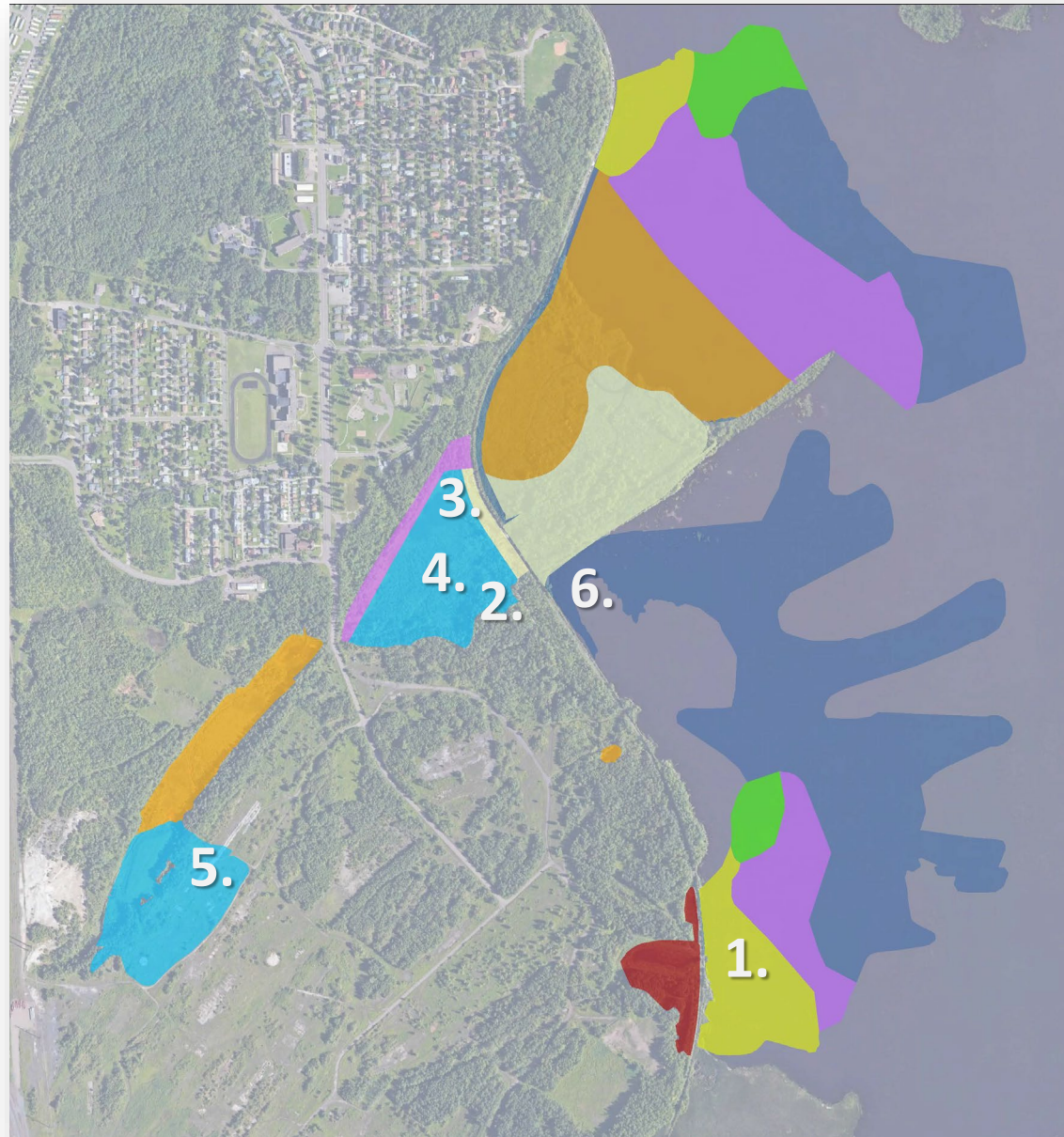
The next part of the presentation will walk through these phases of work to help visualize what this work looks like and what activities are on-going.

[EPA's website](#) for this project is updated weekly to help provide visuals on what operations are underway.

- Hydraulic dredging requires disposal in the Upland CDF Geotubes.
- Mechanical excavation requires disposal in the OU-J CDF.
- A variety of cover and cap placements continue to take place.
- Restoration of some areas has already occurred with habitat restoration extending into summer 2023.

Hydraulic dredging operations: follow the process

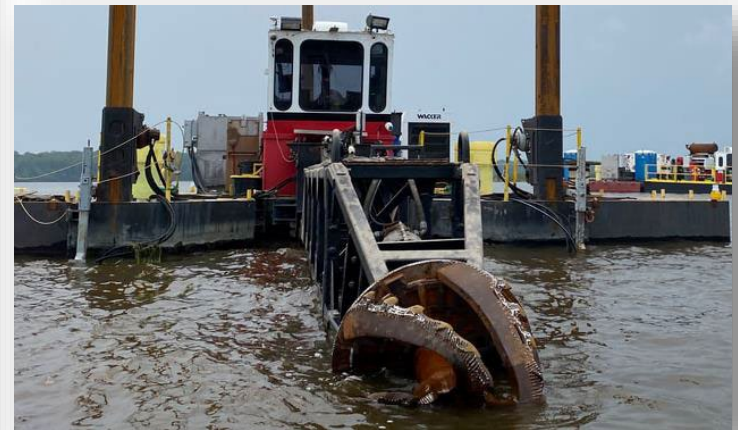
1. Hydraulic dredge
2. Total Clean System (screening large material)
3. Polymer station (sediment flocculation)
4. Geotubes in Upland CDF (gravity dewatering)
5. On-site water treatment plant
6. Discharge clean, treated water back to river



1. Hydraulic Dredging



Hydraulic dredge sits on a barge in the Wire Mill Delta.

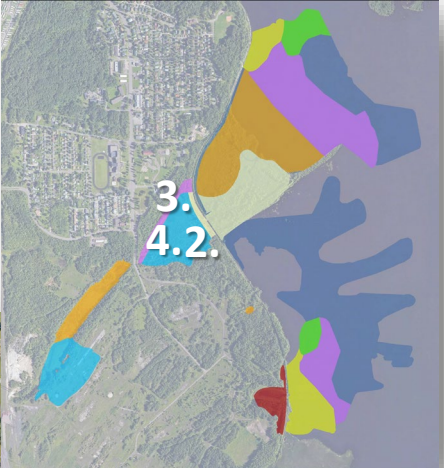


A hydraulic cutting head

Upland CDF operations

4. Geotube bag field (dewater sediments)

3. Polymer Station (sediment flocculation)



An aerial view of the Weir Pond, Upland confined disposal facility (CDF) and restored downstream portion of the Unnamed Creek.

December 6,

2. Total Clean System (screening large debris)



Dredged material is pumped through the Total Clean System to filter out material not suitable for the Geotubes®.

October 4, 2021

5. On-Site Water Treatment Plant



Water is pumped from the Upland CDF sump into water storage settling ponds.

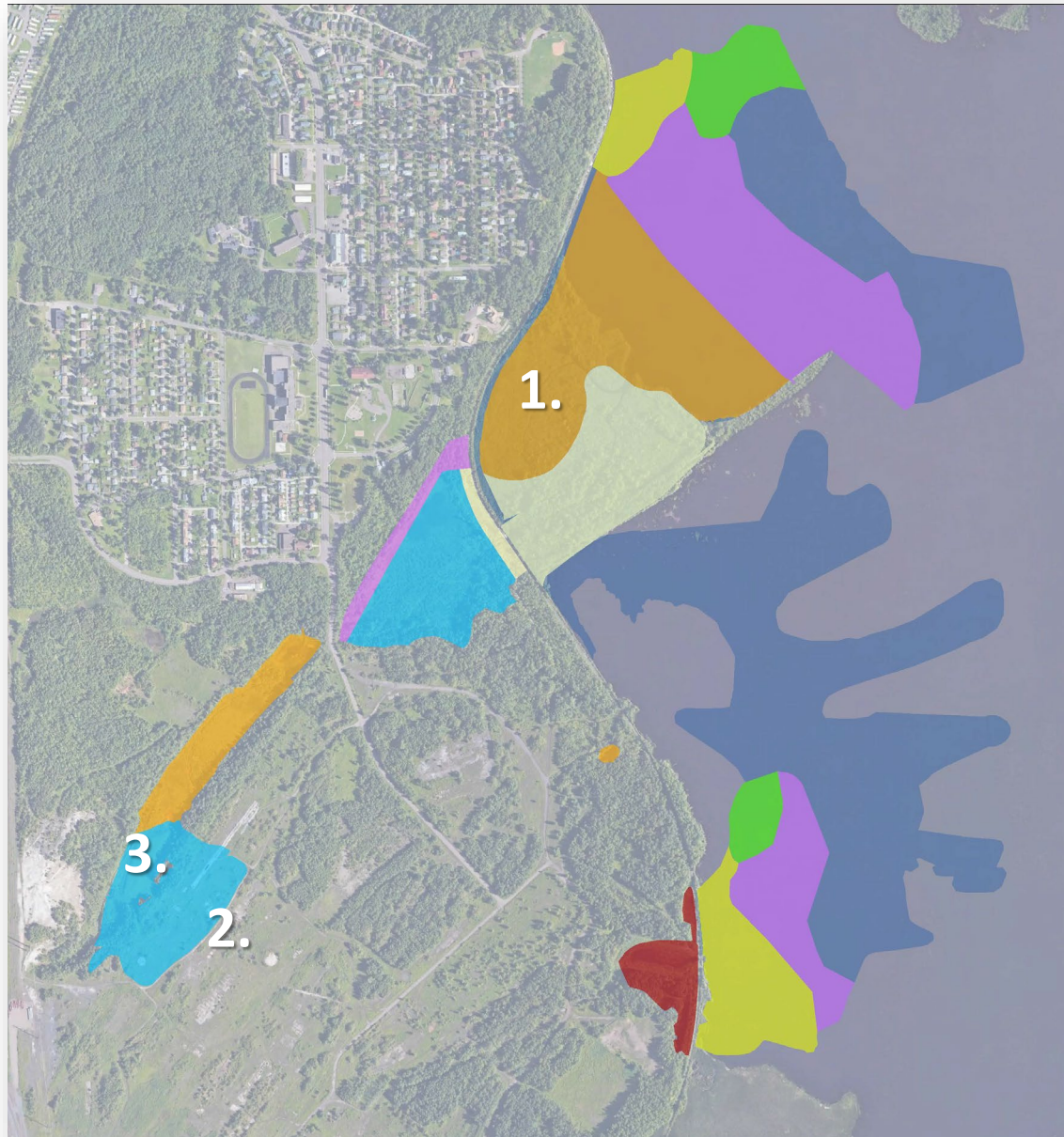
Treatment train includes clarifiers, sand, multi-media, and activated carbon

Water is tested at various steps in the process to make sure that appropriate cleanup thresholds are met.

Clean water is pumped back down to the river for discharge.

Mechanical Excavation (Winter Work): follow the process

- 1) Shallow Sheltered Bay
- 2) Sediment Processing Area (SPA)
- 3) OU-J Confined Disposal Facility (CDF)



1. Mechanical excavation in Shallow Sheltered Bay (Winter work)



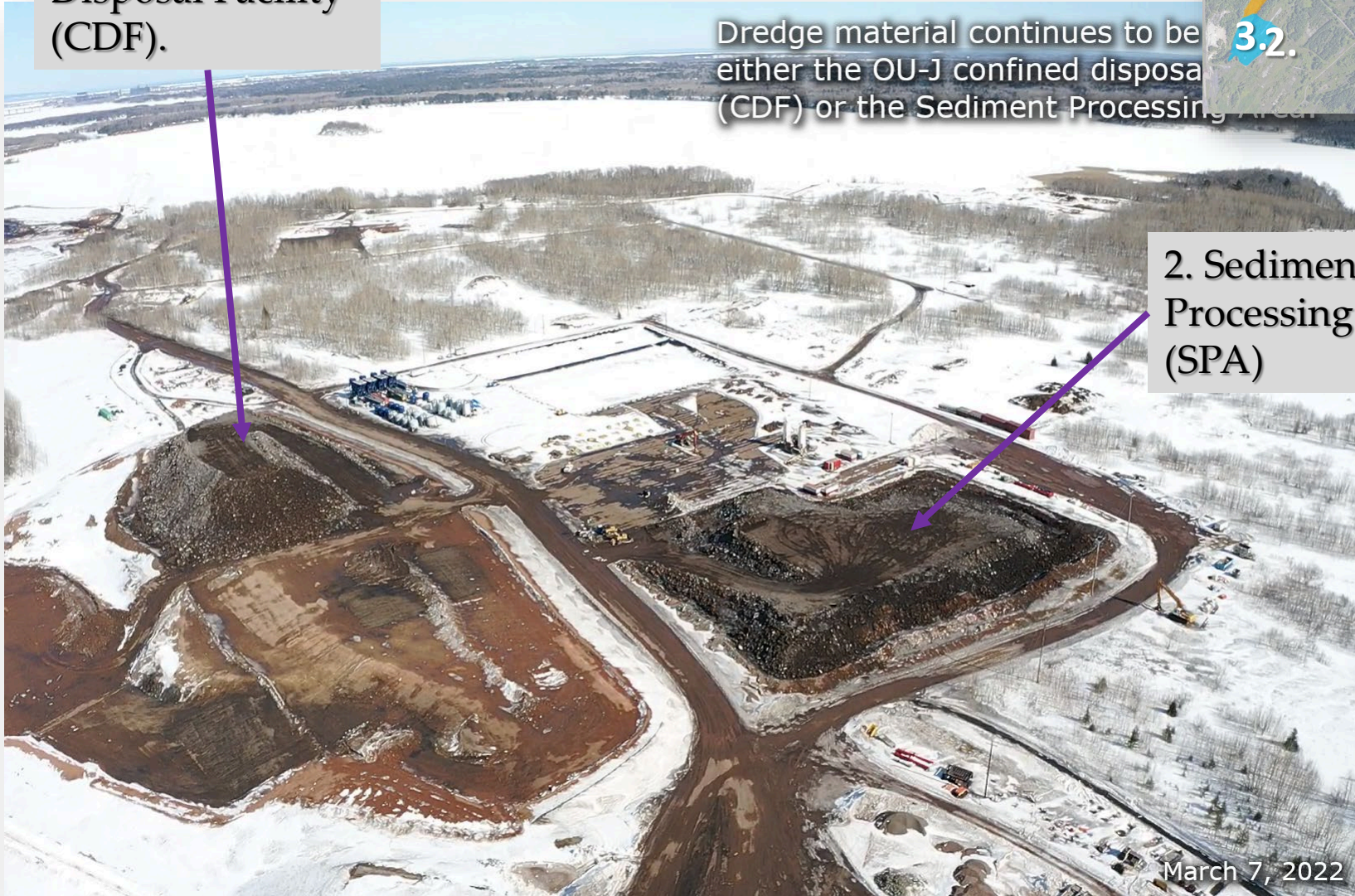
Sediment Processing Area (SPA) and OU-J CDF

3. OU-J Confined Disposal Facility (CDF).

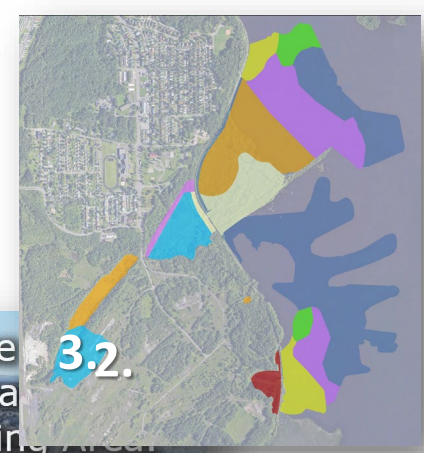
Dredge material continues to be either the OU-J confined disposal facility (CDF) or the Sediment Processing Area (SPA).

3.2.

2. Sediment Processing Area (SPA)

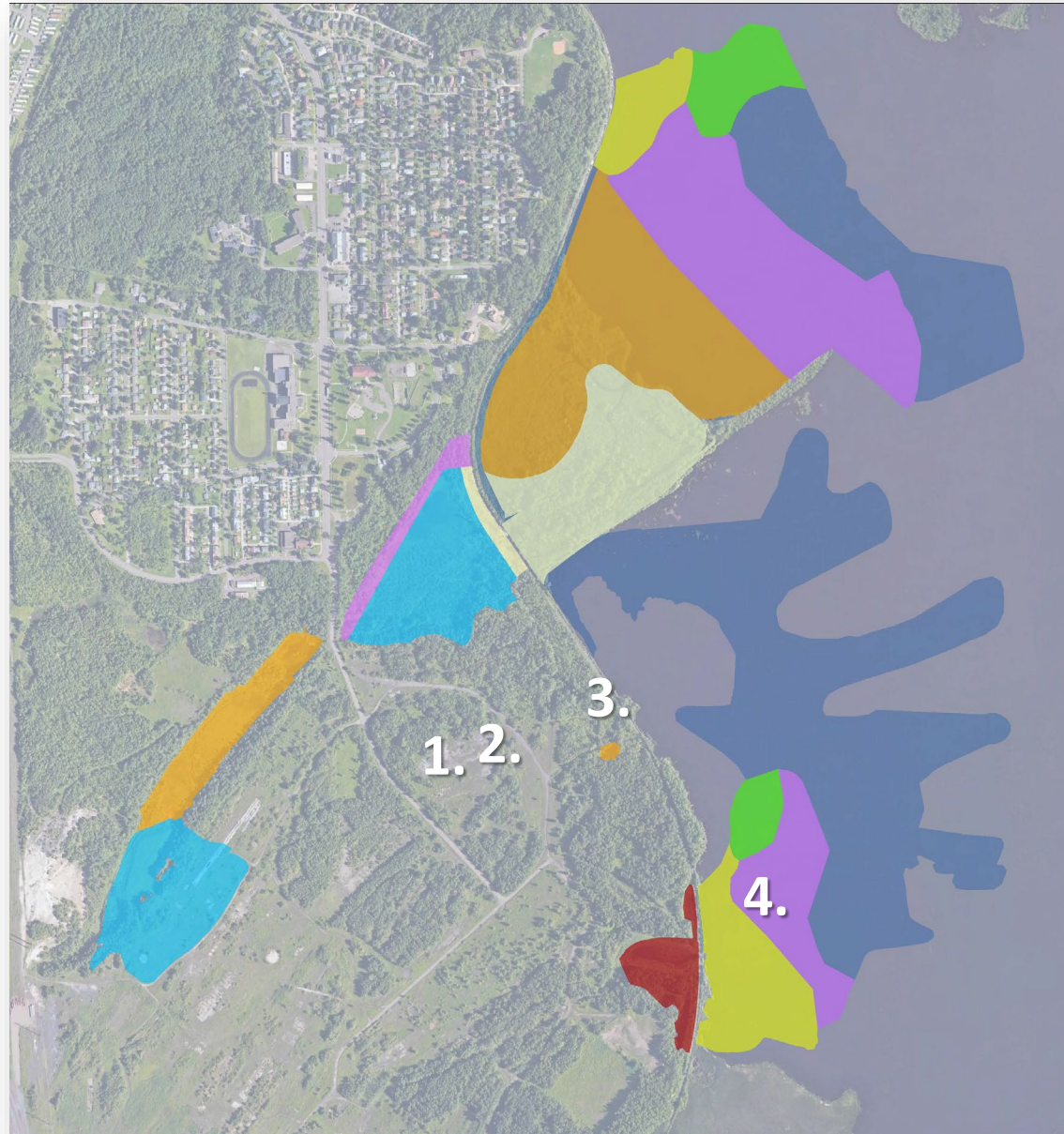


March 7, 2022



Remedial capping operations: follow the process

- 1) Material laydown area
- 2) Slurry plant
- 3) Piping to/from slurry plant
- 4) Neenah Capping plant



Remedial capping operations: follow the process



1. Capping sand is stockpiled in the laydown area

2. Sand is made into a slurry and pumped to the barge.

3. In-take water and pipes to the capping plant are just north of the Unnamed Pond

4. Neenah capping plant

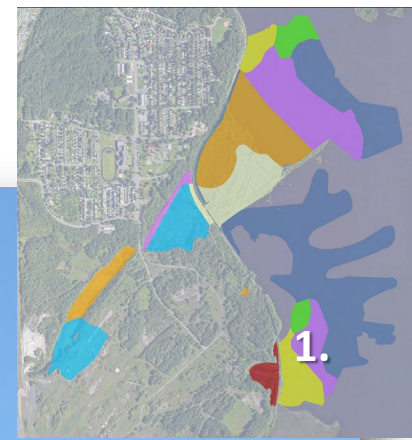


Turbidity curtains are installed in the Wire Mill Delta to prepare for placement of clean capping material.

Slurry pipe to the capping plant

May 2, 2022

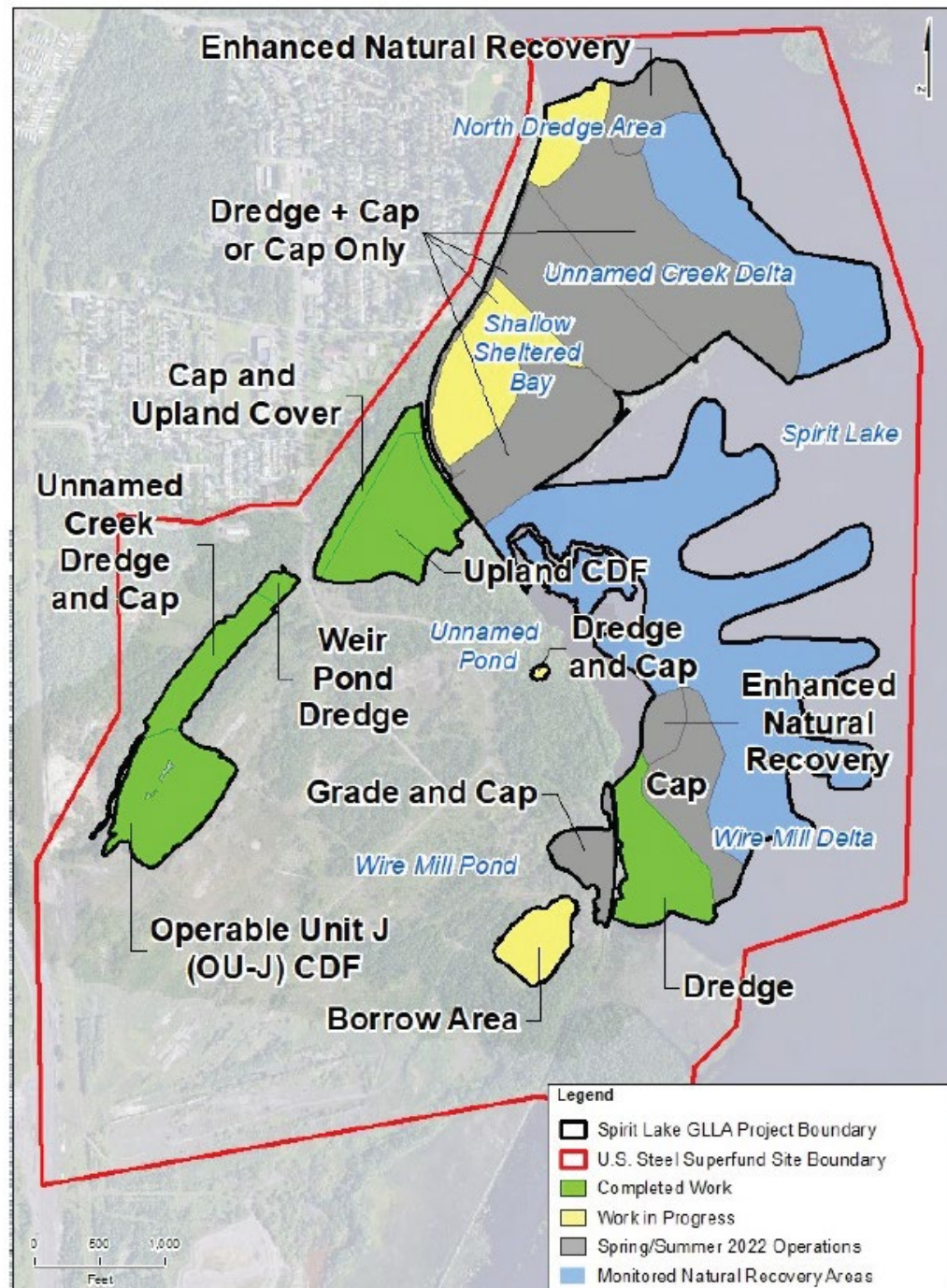
4. Neenah capping plant



PHASE 1 WORK

2020:

- ✓ Site preparation, mobilization and temporary facilities.
- ✓ Began water treatment plant setup
- ✓ Expanded existing Operable Unit J (OU-J) Confined Disposal Facility (CDF) base.
- ✓ Unnamed Creek was diverted to allow cleanup work to begin in the creek floodplain.
- ✓ New channel was constructed where the Unnamed Creek would be permanently rerouted.



Unnamed Creek

Before



After



Upland Habitat Restoration



Weeks of September 13 and September 27, 2021, Photo #4: A view of the restored upstream portion of the Unnamed Creek. (9/27/2021)

Weir Pond (Nov 2021)



Phase 1 work showing upland portions of the project area



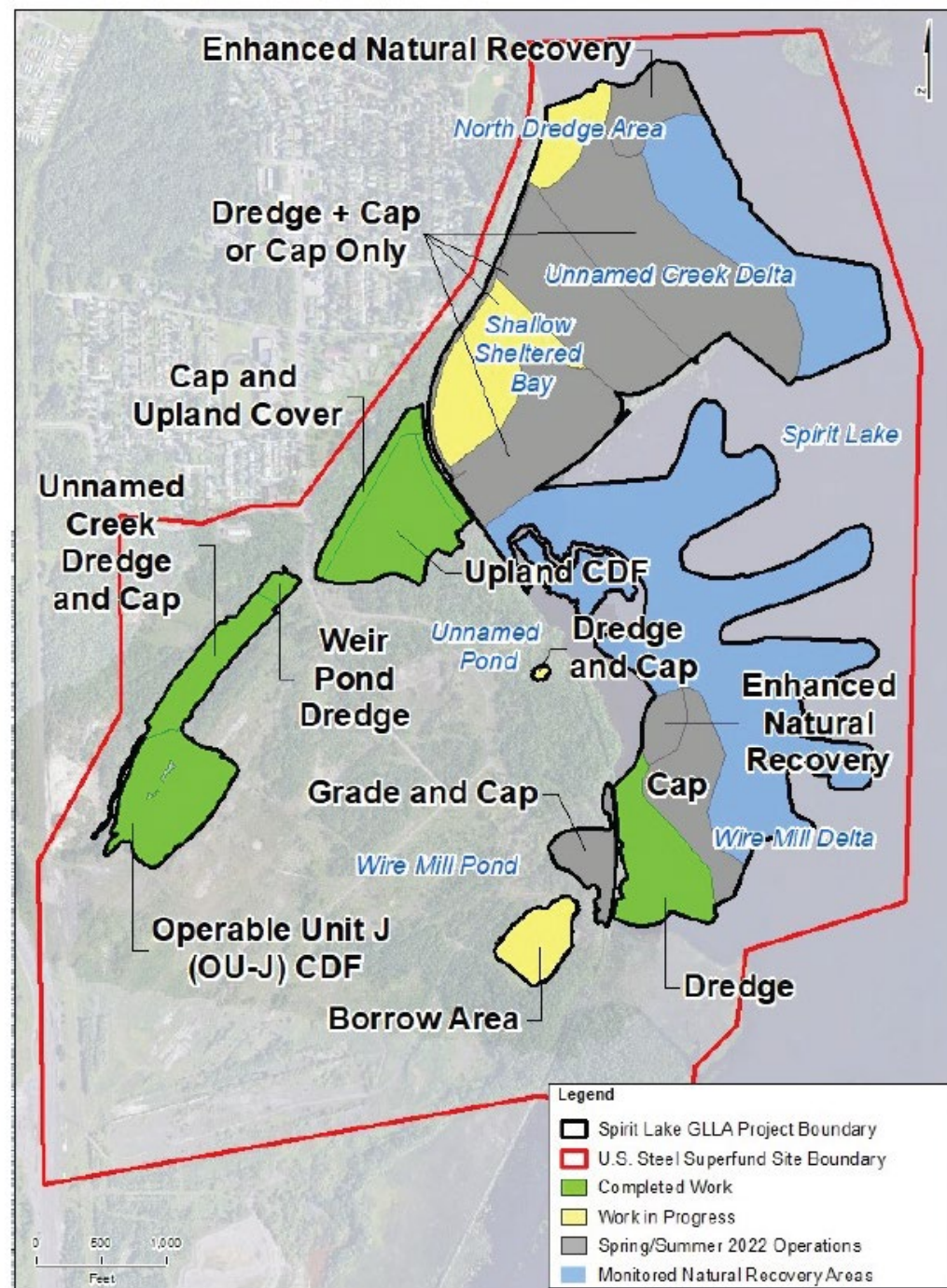
View from the Upland Confined Disposal Facility (CDF) southwest to the Weir Pond and upstream Unnamed Creek.

April 25, 2022

Phase 2 Work

2021:

- ✓ Finished Water Treatment Plant setup
- ✓ Completed cleanup of Unnamed Creek and restored creek and wetlands
- ✓ Capped Unnamed Creek and Weir Pond
- ✓ Constructed and placed foundation of Upland CDF
- ✓ Dredged the Unnamed Pond and Weir Pond
- ✓ Hydraulically dredged Wire Mill Delta and placed a thin layer of clean sand (residual cover) over dredged surfaces.
- ✓ Began hydraulic dredging of the North Dredge Area.
- ✓ Placed dredged sediment into the Upland CDF in Geotubes® to dewater.
- ✓ All water was treated at the on-site water treatment plant before discharge back to Spirit Lake.
- ✓ Began mechanical excavation of Shallow Sheltered Bay in winter



Hydraulic Dredging



Hydraulic dredge sits on a barge in the Wire Mill Delta.



Residual Cover placement (Wire Mill Delta)



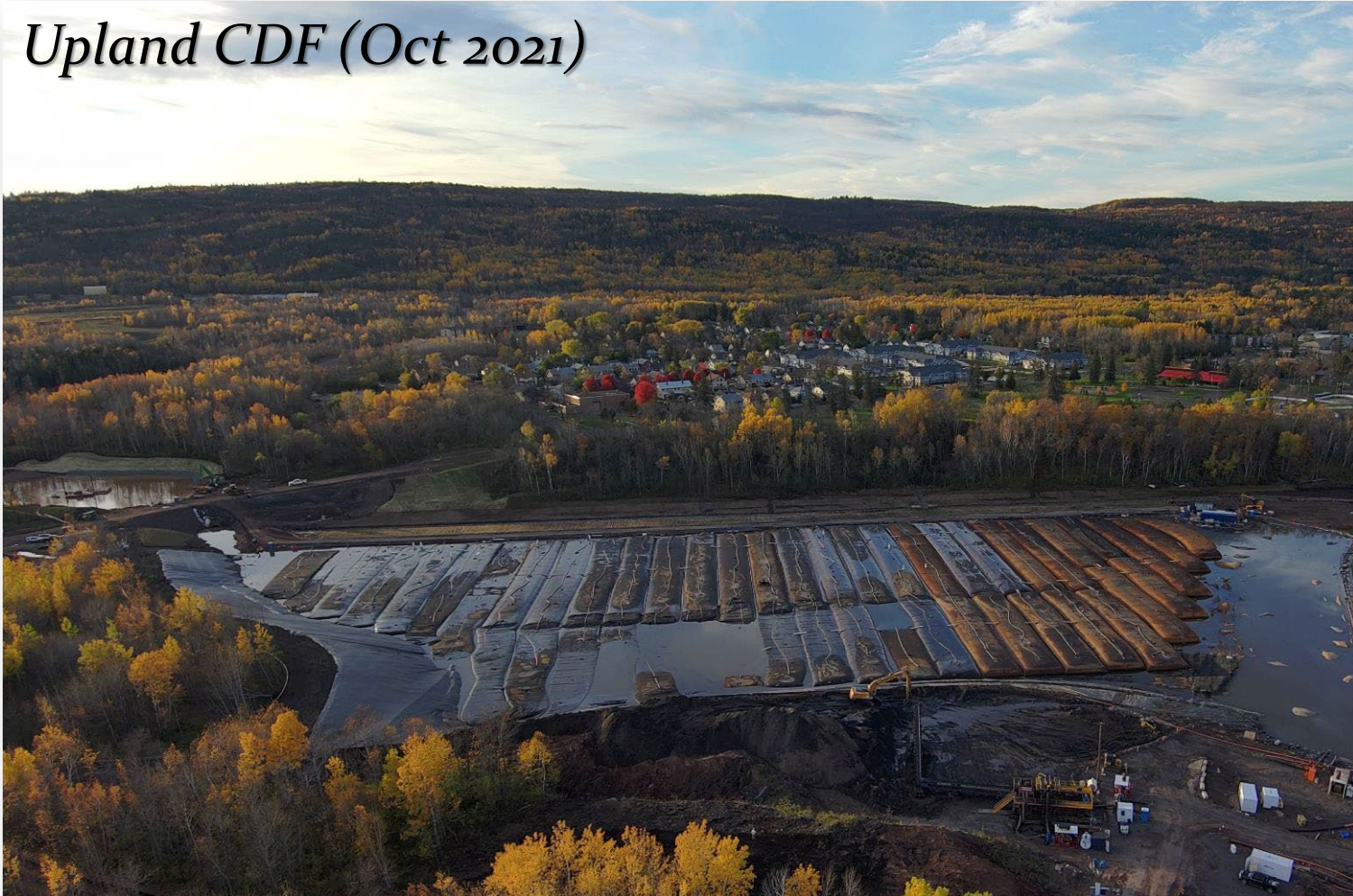
Week of Nov. 8, 2021, Photo #2: Residual cover placement in the Wire Mill Delta was completed. The residual cover is a thin layer of clean sand that ensures the dredge surface is fully remediated and supports recolonization of native species. (11/8/2021)

Upland CDF Geotubes®

Dredge material from the Wire Mill Delta is pumped into Geotubes® in the Upland CDF.



Upland CDF (Oct 2021)



Week of Oct. 25, 2021, Photo #2: An aerial view of the Upland confined disposal facility (CDF) and Geotubes®. (10/11/2021))

What is the timeline?

- Work started in October 2020 and has been on-going since that time.
- Remediation work (dredging/capping) will be done in 2022.
- Restoration work (planting) will be done during the 2023 growing season
- Warranty and establishment will take 2-3 years for the restoration work.
- Long-term monitoring of the project will continue after that point.

October 18, 2021

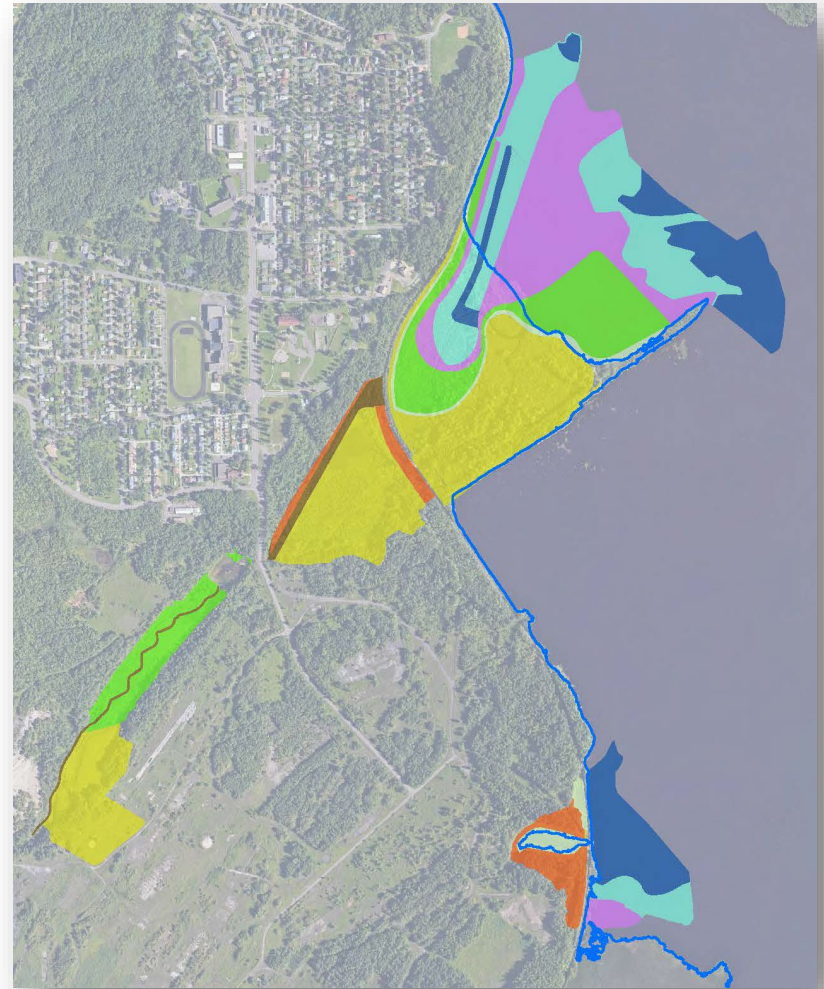
Impacts

- EPA and U. S. Steel are striving to “be good neighbors” as we work to efficiently and safely complete the required remediation and restoration efforts here at the site.
- There will be noise, dust, and light impacts.
- Operations are occurring 24/6 from now into November 2022. We want to complete major remediation work this year for a variety of reasons.
 - Dredging through June 2022
 - Capping through November 2022
- We understand this can be extremely disruptive and are working hard to minimize these impacts.



Benefits

- Progress towards removal of beneficial use impairments in the St. Louis River AOC.
- Creation of new 42-acre shallow sheltered bay habitat feature.
- Creating new opportunities to safely recreate along the restored shoreline.
- Connecting the great work at this site with other trails and opportunities along the St. Louis River corridor.
- The GLLA program has allowed for the cleanup of this site to be accelerated significantly, as well as enhancing the amount of habitat restoration that has been made possible.





Long-term monitoring

- The Great Lakes Legacy Act requires that the nonfederal sponsor (U. S. Steel) remain responsible for the long-term monitoring and maintenance of the site after completion.
- U. S. Steel, EPA GLNPO, Region 5 Superfund, MPCA, and MNDNR will collaborate on creating an appropriate long-term monitoring plan for the GLLA project.
- Work under other programs (State or Federal) will still take their appropriate steps under their own authorities after the GLLA project is complete. Those discussions and approaches are not being discussed at this meeting.

Below are views of the site from the upstream Unnamed Creek area looking northeast toward Spirit Lake.



Before: View toward Spirit Lake pre-construction.



In progress: View toward Spirit Lake after remediation and planting but before full vegetation establishment.



After: Conceptual rendering of view toward Spirit Lake after remediation and restoration is complete.

Below are views of the site from the Weir Pond area looking northeast toward Spirit Lake.



Before: Aerial view of Upland CDF area facing toward Spirit Lake pre-construction.



In progress: Photograph of the Upland CDF facing Spirit Lake during remediation.



After: Conceptual rendering of view toward Spirit Lake after remediation and restoration is complete.

Below are views of the site from the Weir Pond area looking southwest toward upstream Unnamed Creek.



Before: Photograph of Upland CDF facing toward Spirit Lake in early construction stages.



In progress: Photograph of the Upland CDF facing Spirit Lake during remediation.



After: Conceptual rendering of view from Spirit Lake after remediation and restoration is complete.



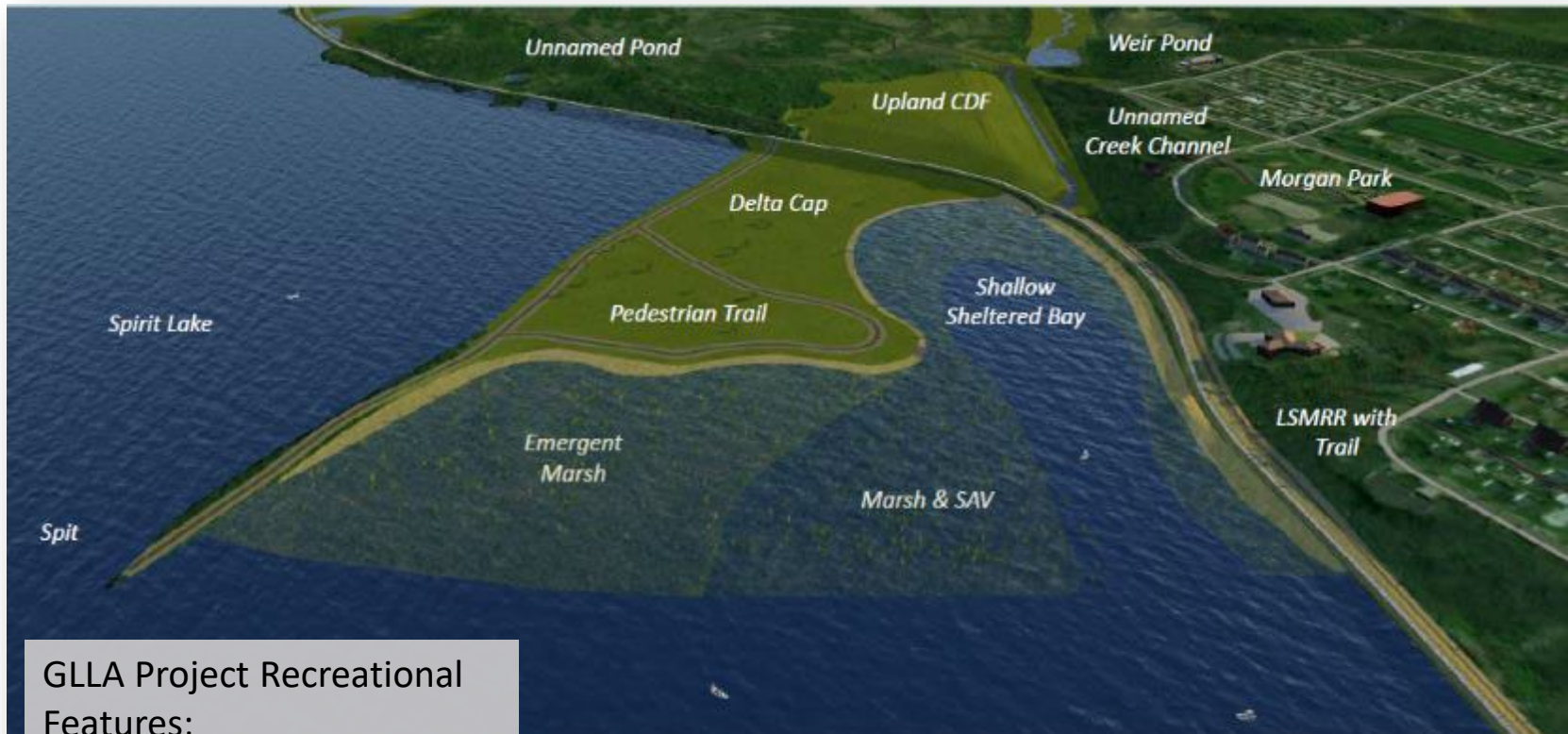
Spirit Lake Site Improvement



Before: Below is the aerial view of the full site from the Unnamed Creek Delta looking southwest toward upstream Unnamed Creek.



Conceptual Site Restoration



GLLA Project Recreational Features;

- New trails, connector trails to regional trail
- Improvements to historic railroad
- Fishing area
- Canoe-kayak launch
- Overlooks, interpretive features



Who is leading Outreach and Community Involvement?

- The GLLA Program works with Illinois-Indiana Sea Grant to help provide outreach for our sediment projects here in Great Lakes AOCs.
- Spirit Lake has a dedicated Outreach Team that meets monthly to identify outreach needs and guide communications about the project.
- EPA has a Community Involvement Coordinator (CIC) for this project, Francisco Arcaute. He is the main point of contact for inquires about the project.

Community Involvement Coordinator

Francisco Arcaute

312-886-7613

Arcaute.francisco@epa.gov

How are we providing information about the project?

• **Online Photo Gallery**

- EPA continues to update its website weekly to provide updates on the project.
- Photos, like the ones in this presentation, are posted to help the community and others safely see and understand all the work going on at the site.

• **Newsletters/Factsheets** are updated periodically and posted on the EPA website

• **Informational Kiosks** are located near the site (88th and Idaho) and MPCC to give specific updates on what is going on at the site.

• How are we doing? Please take the **survey!**

Website: www.epa.gov/great-lakes-aocs/spirit-lake-great-lakes-legacy-act-cleanup

A screenshot of a newsletter titled "Spirit Lake Environmental Cleanup Continues Under GLRI" dated December. The newsletter includes the EPA logo, contact information for the Community Involvement Coordinator and EPA Project Manager, and details about the GLRI program. It also lists cleanup activities for 2021, such as hydraulic dredging and sediment cover placement. Two small photographs show dredging equipment and material being pumped into a container.

EPA
United States
Environmental Protection
Agency

For more information
For questions or concerns regarding this
site, please contact:
Community Involvement Coordinator
Francisco Arcaute
312-886-7613
arcaute.francisco@epa.gov

EPA Project Manager
Mark Loomis
312-886-8406
loomis.mark@epa.gov

GLRI Program Manager
Scott Ciesielski
312-333-9184
scott.wski@scottelma.gov

Web: <https://www.epa.gov/great-lakes-aocs/spirit-lake-great-lakes-legacy-act-cleanup>

Cleanup possible through GLRI
The Great Lakes Restoration Initiative, or GLRI, was launched in 2010 to accelerate efforts to protect and restore the Great Lakes. Sixteen federal partners work together on five priorities:

- Cleaning up **Great Lakes Areas of Concern**
- Preventing and controlling invasive species
- Reducing nutrient runoff that contributes to harmful nuisance algal blooms
- Restoring habitat to protect native species
- Conducting education and outreach for future restoration efforts

GLRI's funds provide up to 65% of the cost of cleanup with a non-federal entity contributing the balance through a Great Lakes Legacy Act partnership—under which the Spirit Lake work is being done. GLRI partnerships have cleaned up 27 sites in six Great Lakes states and remediated 4.6 million cubic yards of contaminated sediment.

Spirit Lake Environmental Cleanup Continues Under GLRI
December

Spirit Lake GLLA Remediation and Restoration
Duluth, Minnesota

U.S. Environmental Protection Agency and United States Steel Corporation have partnered to clean up contaminated sediment and soil in the Spirit Lake area of the St. Louis River in Duluth, Minnesota. This project is being conducted under the Great Lakes Legacy Act and is jointly funded by EPA and U. S. Steel.

The site is located in the St. Louis River Area of Concern and is south of the Morgan Park neighborhood in Duluth. The site has in-water cleanup areas which include Spirit Lake, Unnamed Creek, and Wire Mill Pond as well as onshore clean up areas (see map, page 2).

This project, which began in October 2020, will address impacts from former industrial activities in the Spirit Lake area. Chemicals of concern include polycyclic aromatic hydrocarbons, or PAHs, and associated heavy metals including lead, copper and zinc. This large environmental cleanup includes dredging, capping and monitoring sediment and will result in the creation of new open water and restored wetlands. The cleanup will support the eventual delisting of the St. Louis River AOC and will benefit people who live, work and recreate in and around the AOC and the broader ecological system.

2021 Work Activities
Hydraulic dredging activities began in the Wire Mill Delta in August 2021 and were completed in November 2021. A residual cover, consisting of a thin layer of clean sand, was placed over the remediated dredged sediment surface to support the reestablishment of native species. Hydraulic dredging also took place in the North Dredge Area in November 2021 and will resume in summer 2022. During hydraulic dredging, contaminated sediment and water is pumped through temporary pipes to the Upland confined disposal facility (CDF), where it is processed to remove debris and placed in Geonubes® to dewater. The water is collected and treated on-site at the water treatment plant before being discharged back into Spirit Lake. The Geonubes® will be buried in place within the Upland CDF.

(Continued on reverse page)

A hydraulic cutting head is attached to the dredge equipment in preparation for in-water dredging activities.

Dredge material from the Wire Mill Delta is pumped into Geonubes® in the Upland CDF.



Questions?



Spirit Island + Spirit Lake, Richard Hamilton Smith, The Nature Conservancy

Thank you for coming!

We appreciate you taking time out of your day to learn more about the project and meet our team.



For additional information about the project please remember to:

- ✓ Visit EPA's website: <https://www.epa.gov/great-lakes-aocs/spirit-lake-great-lakes-legacy-act-cleanup>
- ✓ Checkout Kiosks at the Community Center and 88th and Idaho
- ✓ Contact the project team:

Francisco Arcaute

312-886-7613

Arcaute.francisco@epa.gov