

Spirit Lake Sediment Remediation and Restoration Project

March 4, 2020



Welcome and Introductions

- USEPA - Great Lakes National Program Office
 - Illinois Indiana Sea Grant
 - EA Engineering, Science, & Technology, Inc., PBC
- U. S. Steel
 - Barr Engineering
 - AECOM
- Minnesota Pollution Control Agency

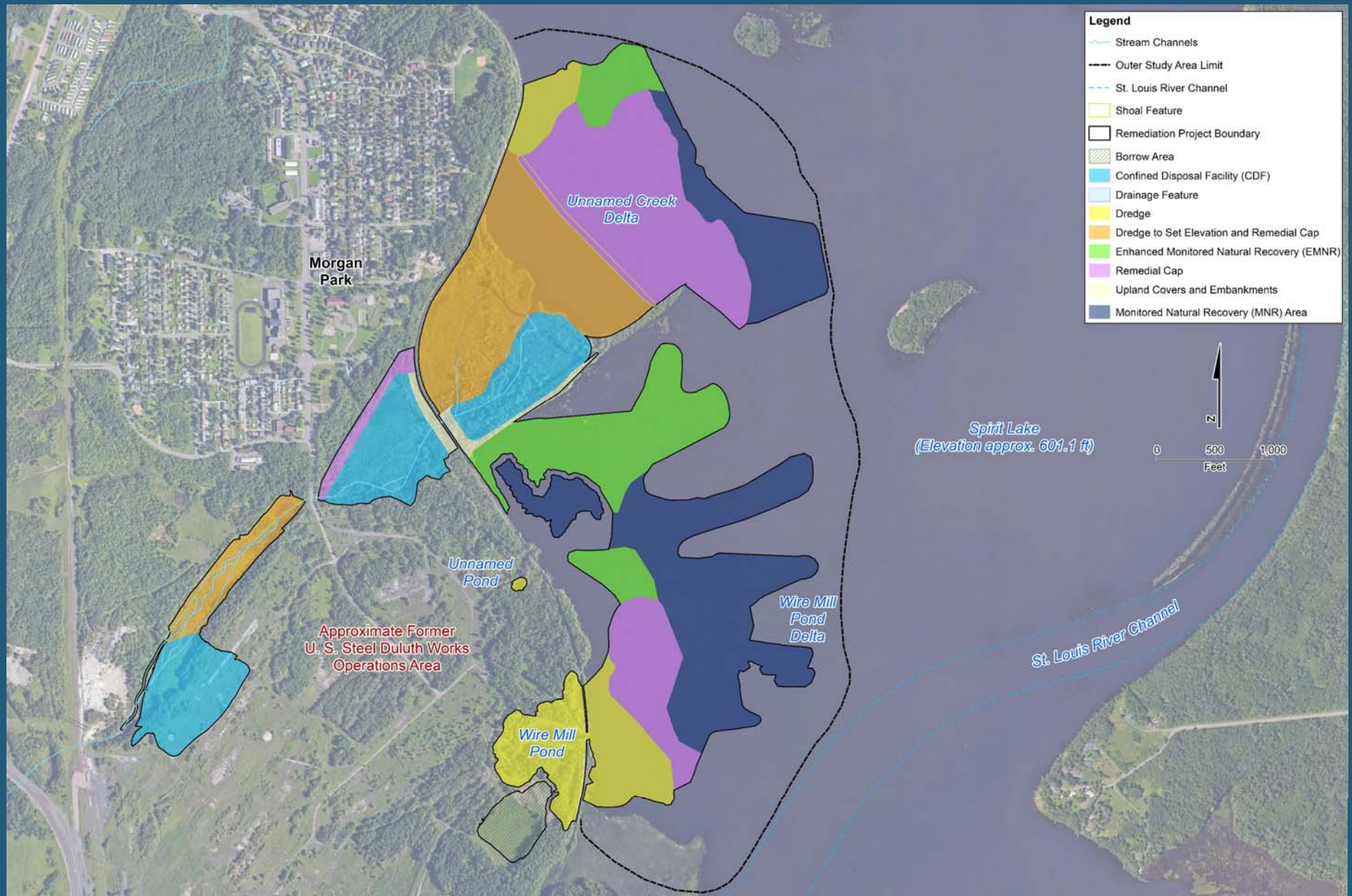


Primary Goals of the Spirit Lake Project

- Reduce ecological and human health risk in the project area
 - Remediate impacted sediment
 - Cleaner lake bottom is safer for fish and wildlife
- Improve aquatic and land habitat quality
 - Restore the areas remediated with native plants

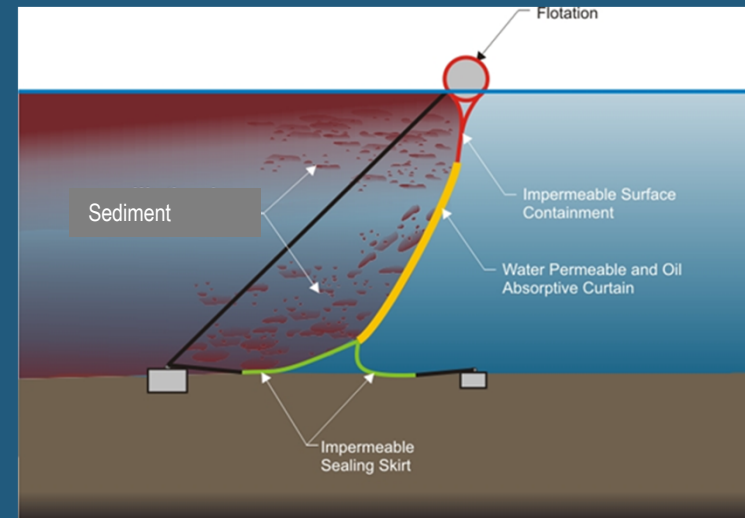


Remedy Visualization



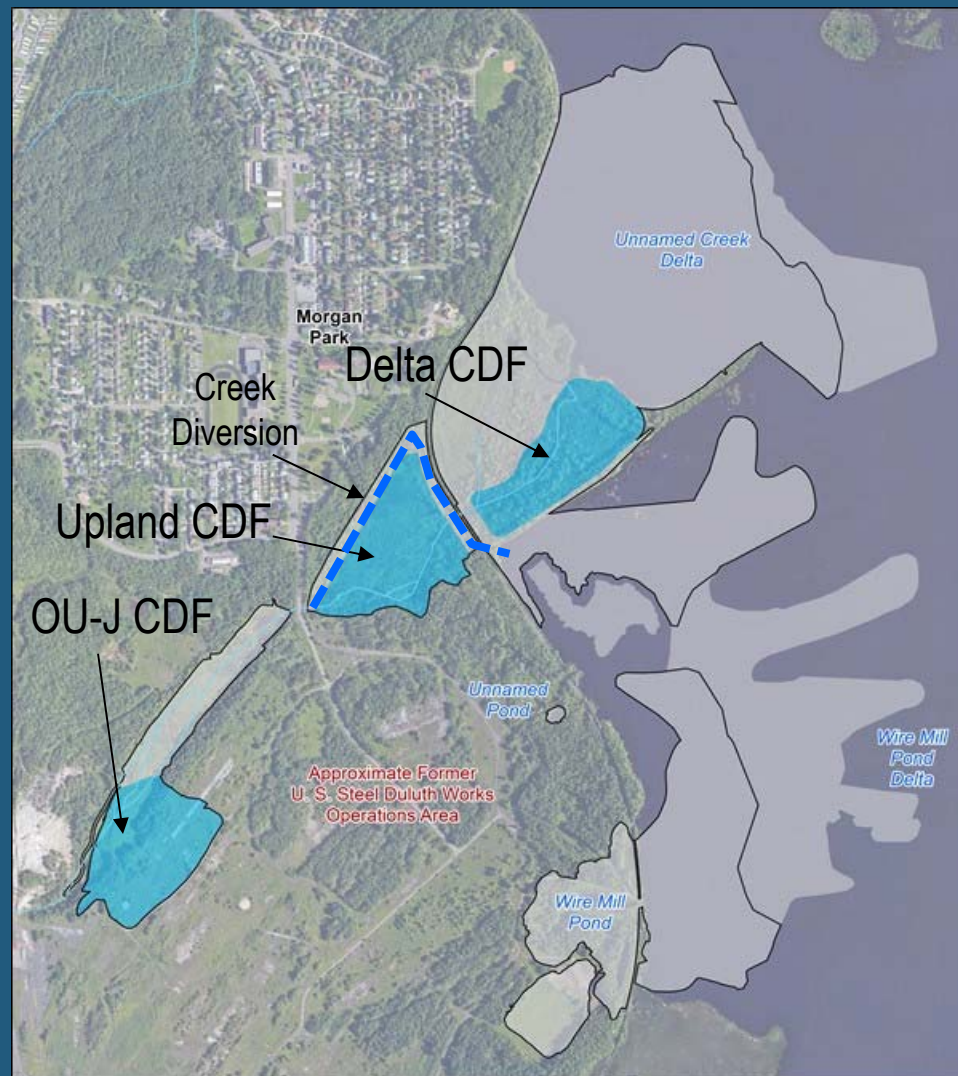
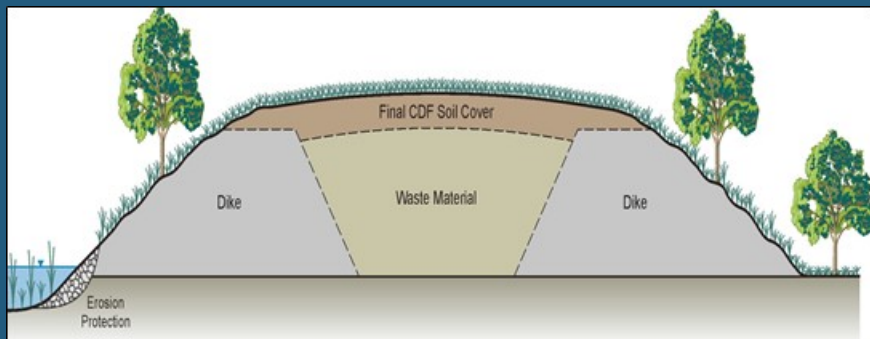
Environmental Protection Controls

- Turbidity barriers during dredging and capping
 - Silt curtains
 - Cofferdam
- Water quality monitoring
- Dust and odor control
- Safety
 - Construction areas fenced with signs posted
 - Buoys and lights on the water



Remediation Overview - CDFs

- Divert Unnamed Creek flow
- Build 3 confined disposal facilities
- Large bermed areas to contain sediment
- 45 CDFs currently used across Great Lakes

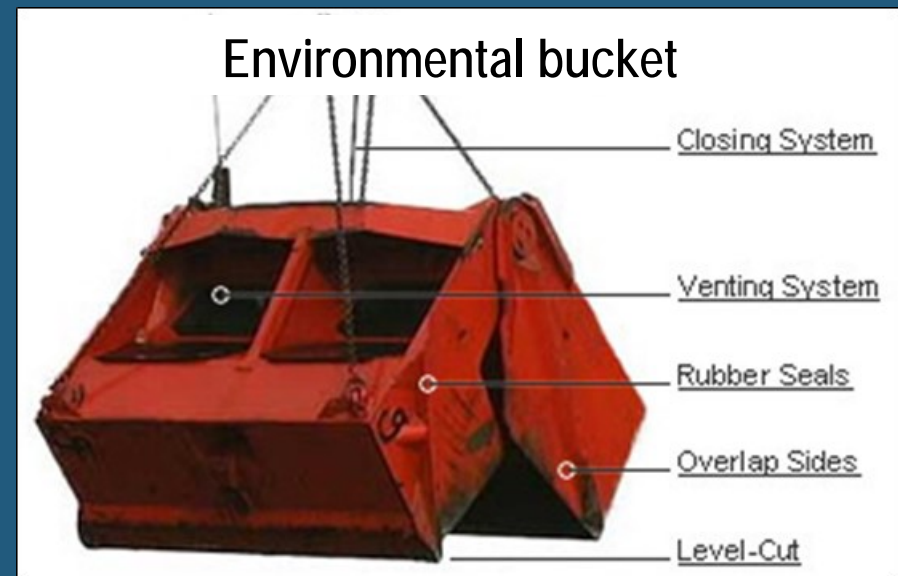
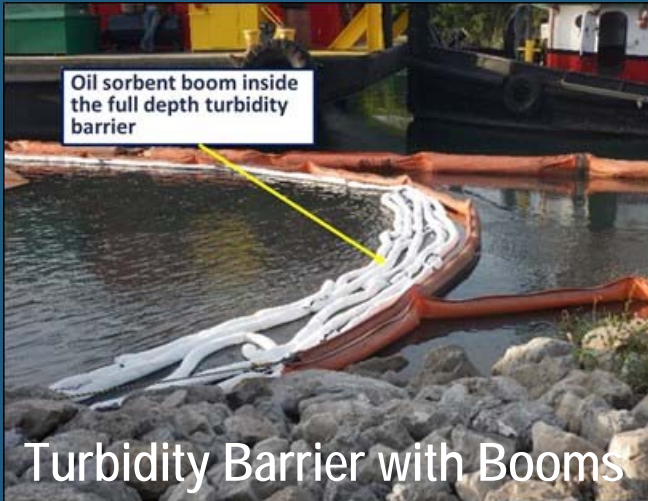


Remediation Overview – Dredging

- Dredge or excavate over 780,000 cubic yards of sediment
- Divert Unnamed Creek and use coffer dam to close off Unnamed Creek Delta for excavation in dry conditions
- Water pumped out from behind dam during excavation will be treated
- Dredge in Wire Mill Pond and in lake inside curtains to control silt

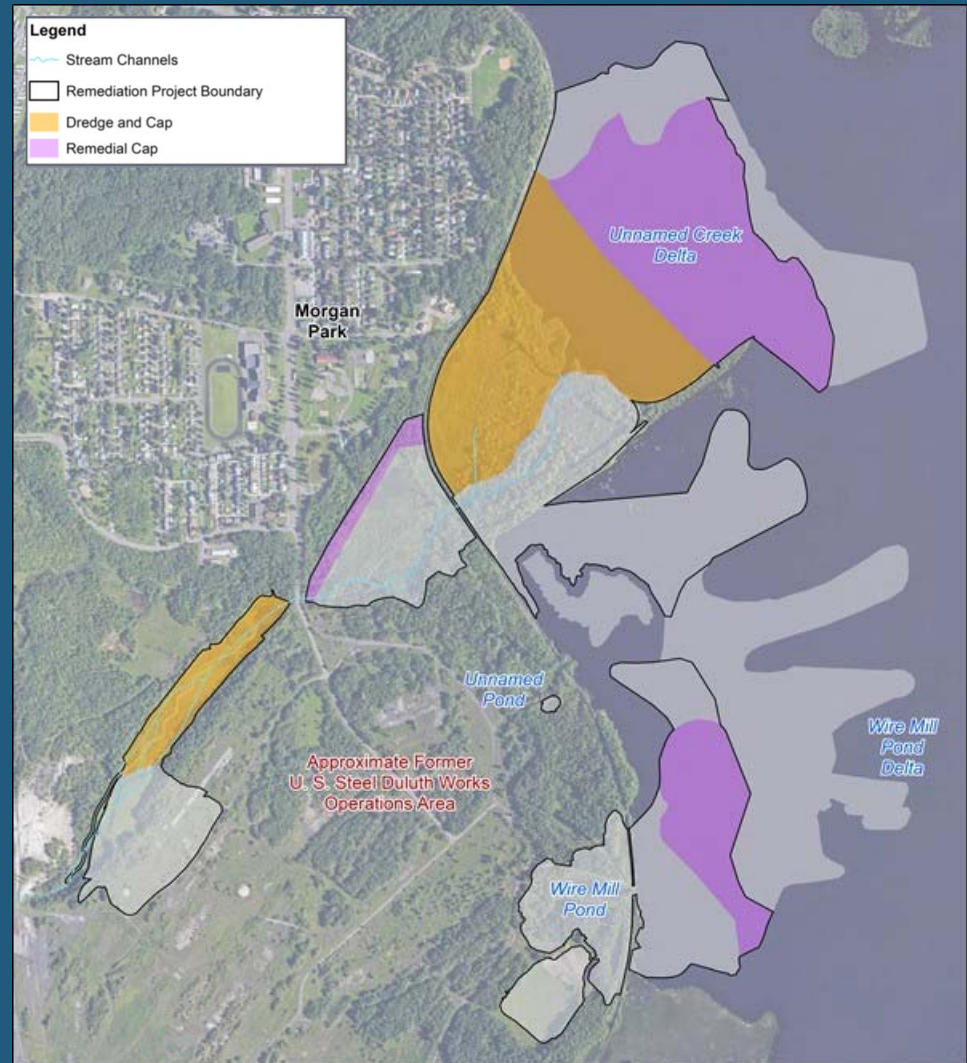


Methods of Safe Dredging



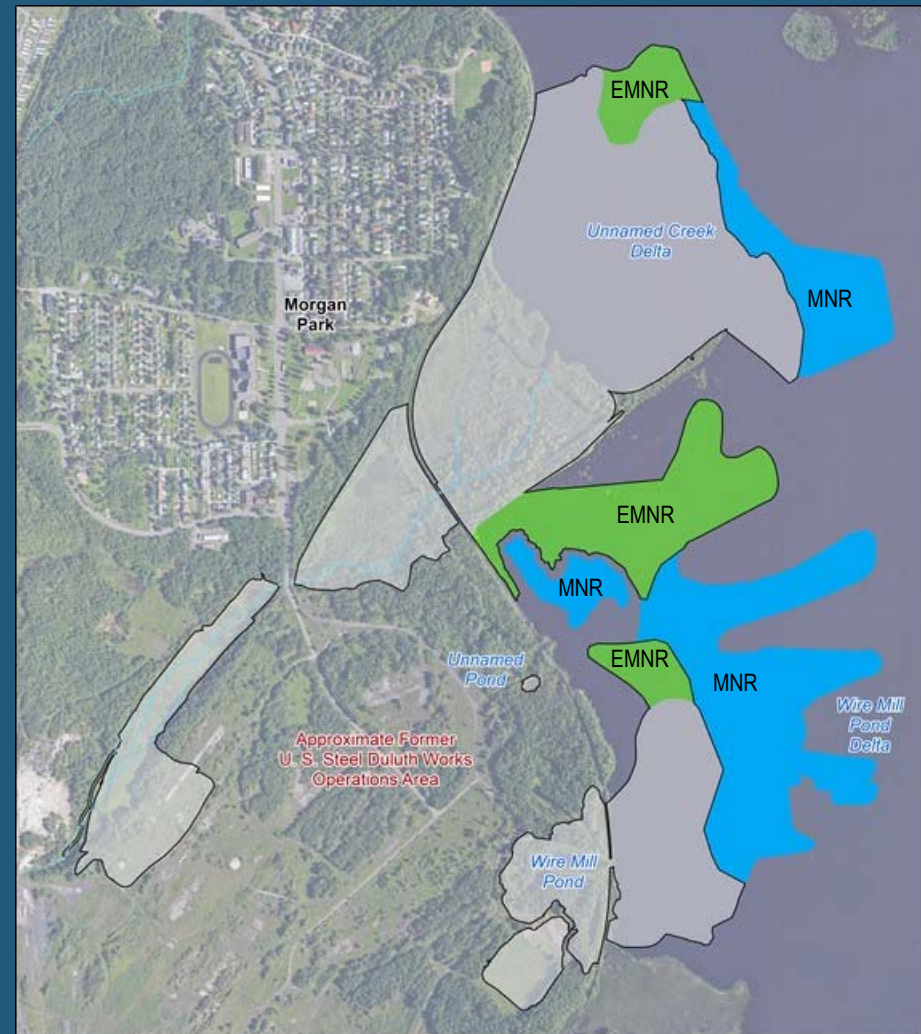
Remediation Overview – Capping

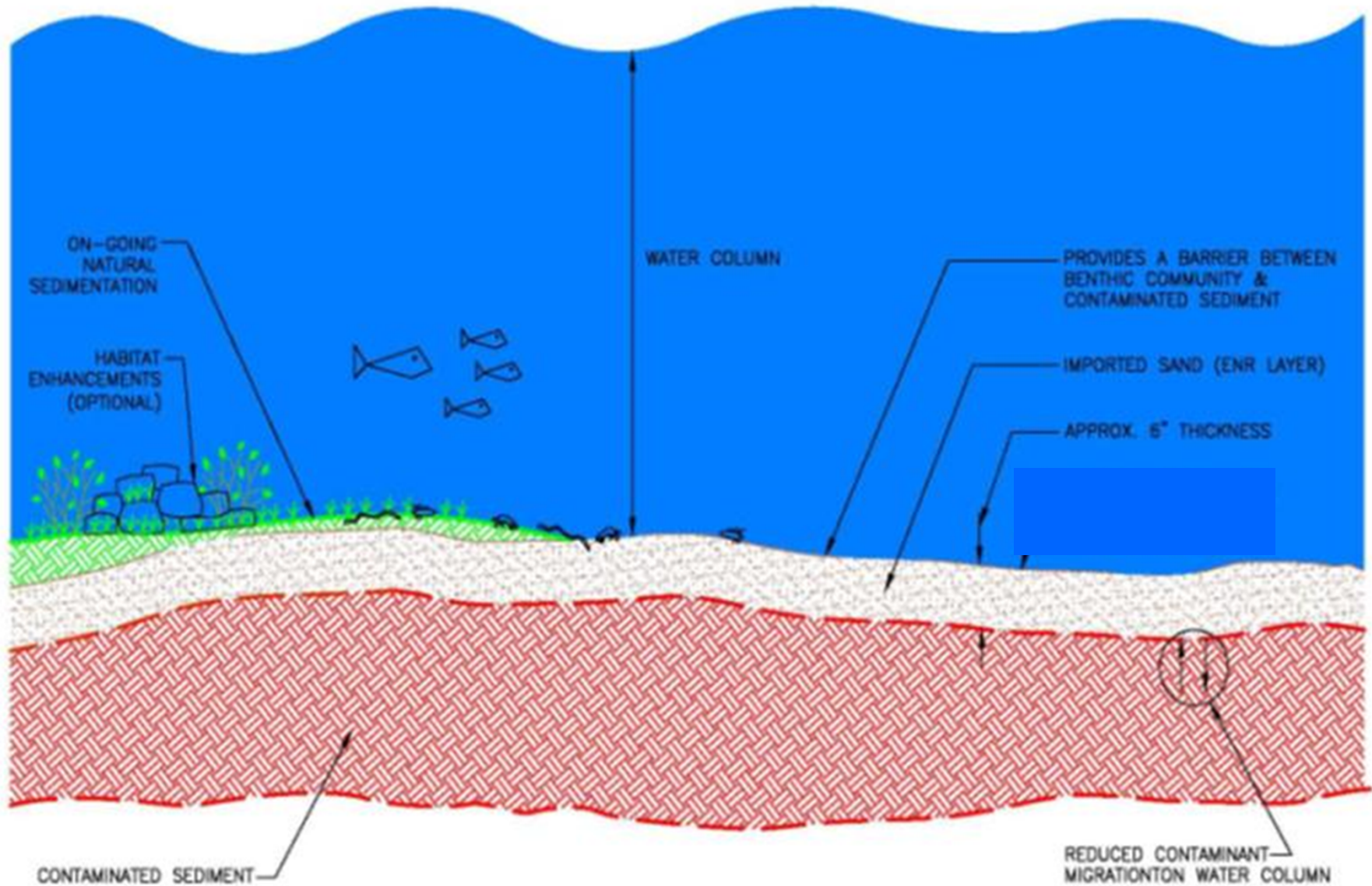
- Capping 120 acres
 - Dredged and undredged areas of Unnamed Creek and its Delta
 - Portions of Wire Mill Pond Delta
- Engineered cap with layers to isolate impacted sediment



Remediation Overview – Natural Recovery

- Studies found the site sediments are recovering naturally through burial and breakdown
- 113 acres of natural recovery
- Enhanced Monitored Natural Recovery (EMNR) where a thin layer of sand will be placed to speed burial
- Monitored Natural Recovery (MNR) where natural recovery will be monitored



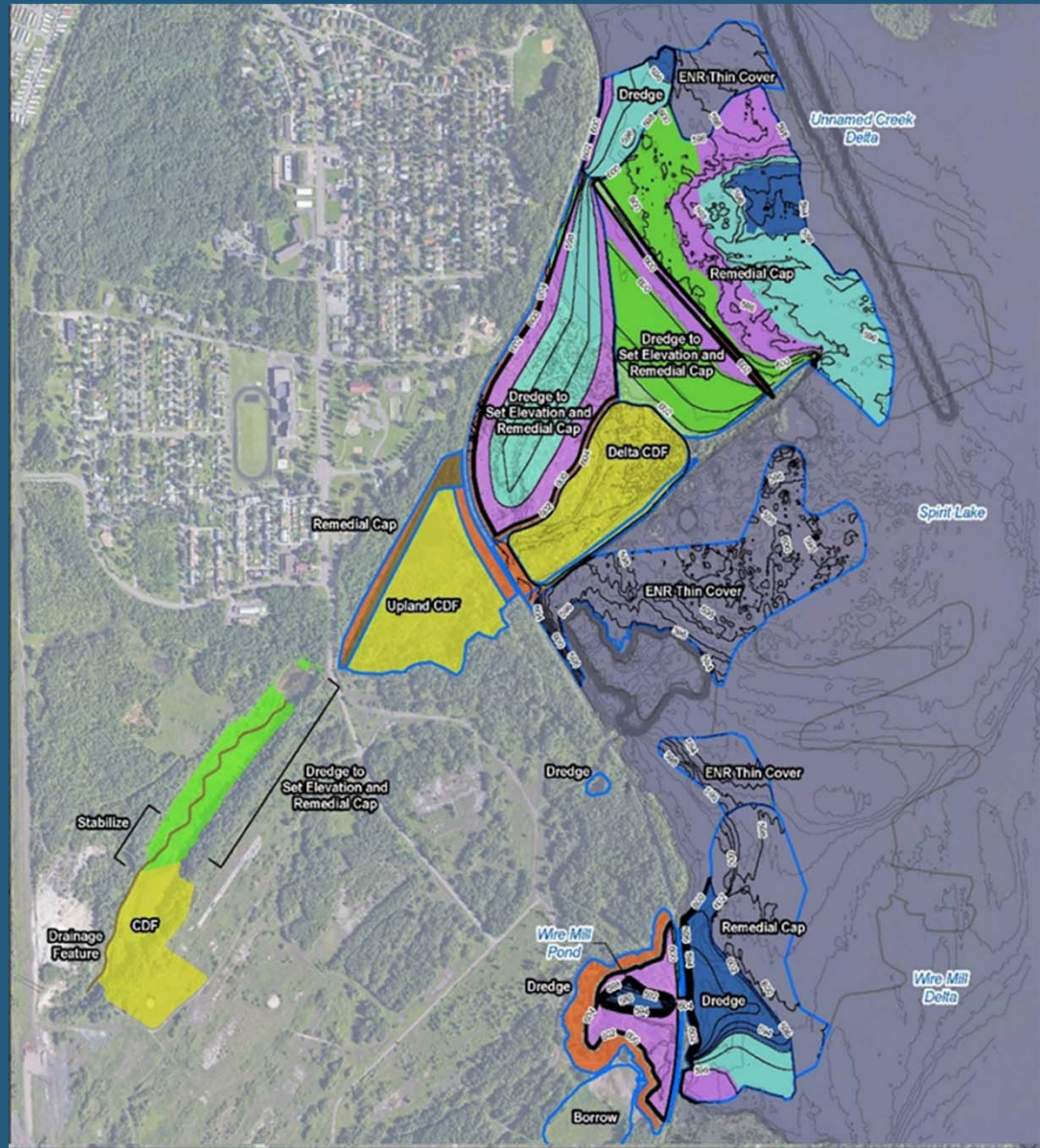


TYPICAL ENHANCED NATURAL RECOVERY (ENR) CROSS SECTION

NOT TO SCALE

Habitat Restoration

- Restoration planned for all areas affected by cleanup
- Key goals
 - Create shallow sheltered bays as fish habitat
 - Provide variety of water depths & associated native plants



Planting Zones

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

Examples of Restored Habitat



Shallow Bays with Improved Sediment Quality



Riparian Zones and Fringe Marsh



Mosaic of Emergent Marsh and Submerged Vegetation

Community

- What to expect during the cleanup
- What to expect after the cleanup
- Cultural Resources and Section 106
- Project schedule

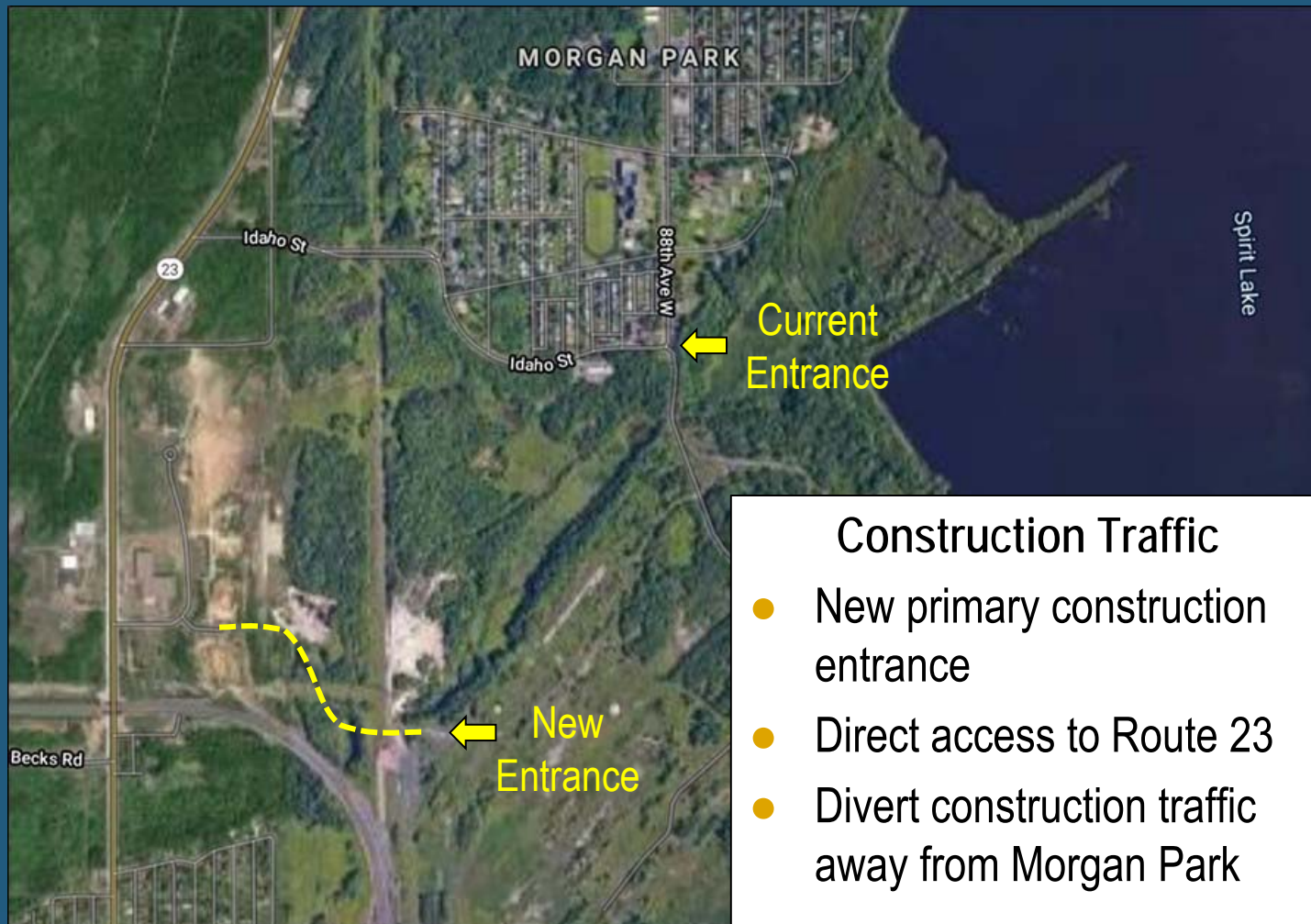


What can Morgan Park residents expect during cleanup operations?

- Daily cleanup schedule
 - 12 and/or 24-hour work periods
 - Daytime schedule as much as possible near Morgan Park
- Construction noise, light, and smells
 - Contractor will submit noise, odor, & lighting mitigation plans – provide measures for controlling impacts
- Tree Clearing
 - Most tree clearing limited to areas where cleanup is performed
 - Downhill and away from view from residences



What can Morgan Park residents expect during cleanup operations?



What can Morgan Park residents expect after cleanup operations are complete?

- Wildlife community
 - Restoration will improve the wildlife habitat in the project area
 - Restoration will improve fisheries with more flow, oxygen, and spawning zones.
- Recreational Potential
 - New trails and improved shoreline fishing access
 - Kayak access and new recreational areas
 - Improved safety along rail line and new educational signage



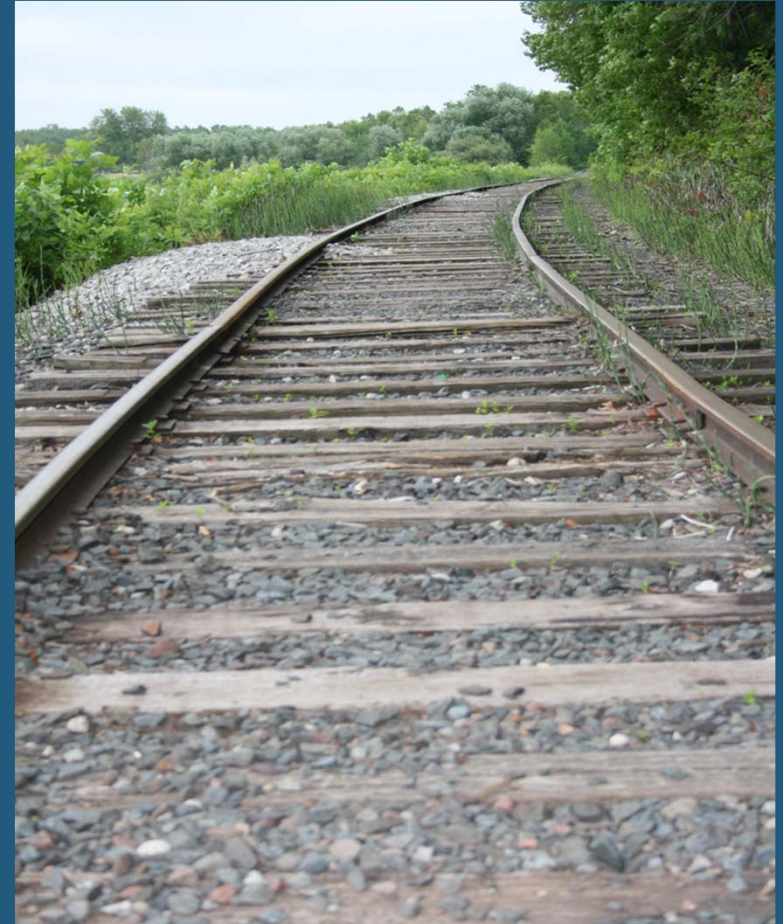
Spirit Lake Cultural Resources

- Spirit Lake includes unique cultural resources
 - Lake Superior & Mississippi Railroad
 - Spirit Island
- EPA performed consultation under the National Historic Preservation Act
 - Goal is to avoid and/or mitigate impacts
 - Performed specific studies of the cultural resources



Spirit Lake Cultural Resources

- Lake Superior and Mississippi Railroad
 - Adverse effects
 - Temporary impacts by installation of rail stops, chain link fences, and truck crossings
 - Temporary halt to scenic rail tours for 3-mile segment during construction
 - Permanent truck crossing and 2 bridges
 - Mitigation
 - Reuse historic materials to extent possible
 - Compatible new materials





Spirit Lake Cultural Resources

- **Spirit Island**
 - **Adverse Effects**
 - Alteration of views to and from the island
 - Introduction of elements considered intrusive to the cultural and spiritual meaning of the island
 - **Mitigation**
 - Ecological and cultural resource management plan and regional interpretation



Tentative Project Schedule

Schedule	Task
March-May 2020	Finalize permits & select construction contractor
June-August 2020	Mobilization to the site, with site surveys, sampling, and preparation
June 2020- December 2022	Construction work ongoing

Overall schedule is influenced by
permit finalization



Questions and comments?

Contacts:

Diana Mally (EPA-GLNPO)

Caitie Nigrelli (Sea Grant Liaison)

mally.diana@epa.gov

cmccoy2@illinois.edu