US Steel Superfund Site Update

March 16, 2015

Minnesota Pollution Control Agency

USS Site Update

Land Activities

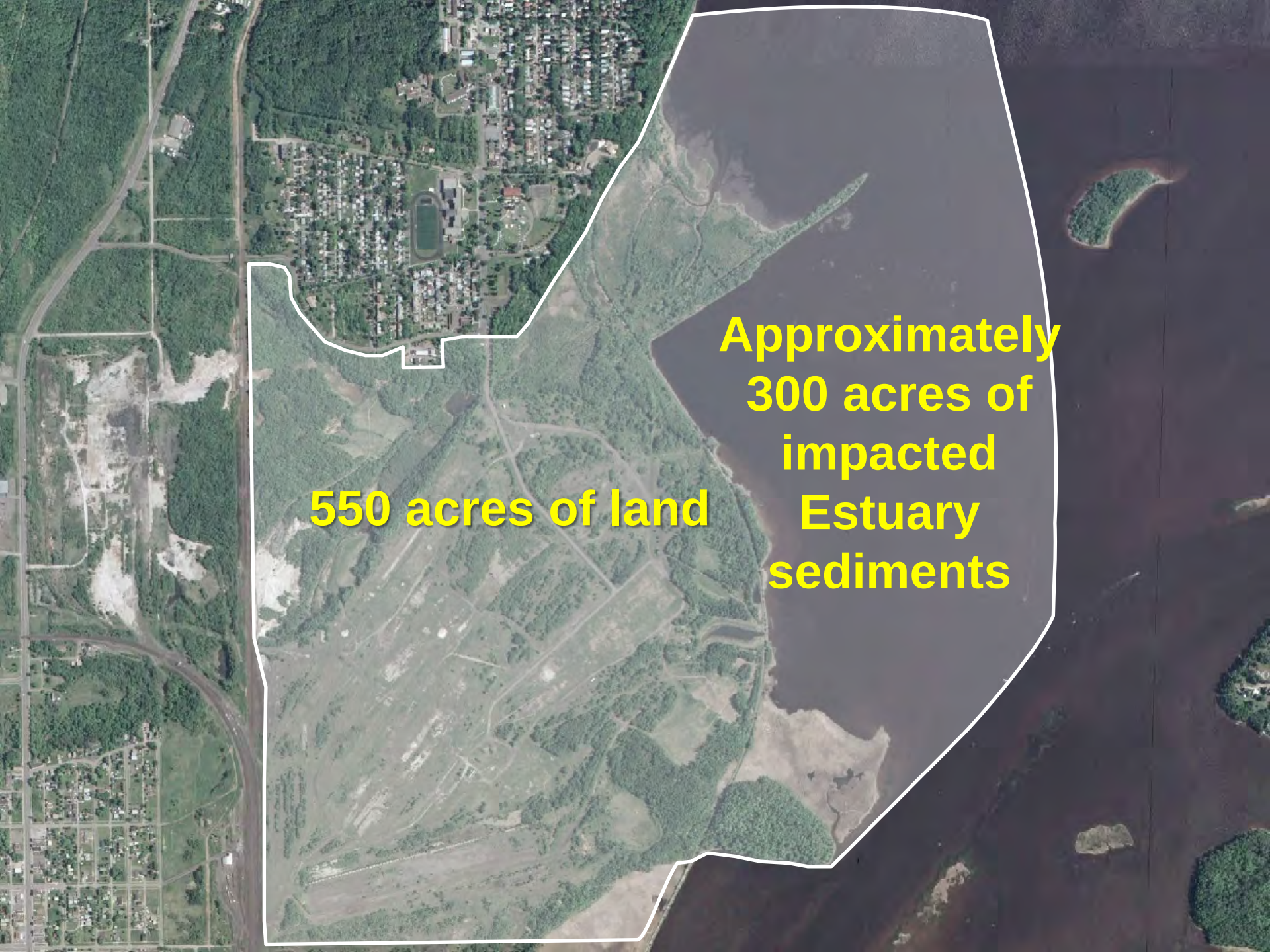
- DSPA soil removal
- Petroleum investigation

Sediment Activities

- Feasibility Study
- Public Involvement
- Schedule to implementation

Minnesota Pollution Control Agency

Site Location


550 acres of land
Approximately 300 acres of impacted Estuary sediments

USS Site History

- Operated from 1915-1979
- Steel and coke production with disposal to the St. Louis River
- Contaminants: PAH's (coal tar), oils and heavy metals in soil, sediment, surface water and shallow groundwater
- Site listed on NPL SF list in 1983-MPCA lead agency
- Visual and "free product" contamination cleaned up in the 1990s at a cost of $12 million
  - –Land units-tar, fuels, drums, tanks, pipelines, building removal
  - –Sediment units-Wire Mill Pond and OUJ-1997

Minnesota Pollution Control Agency

Additional risks to human health and the environment were identified during the 2008 5-year review

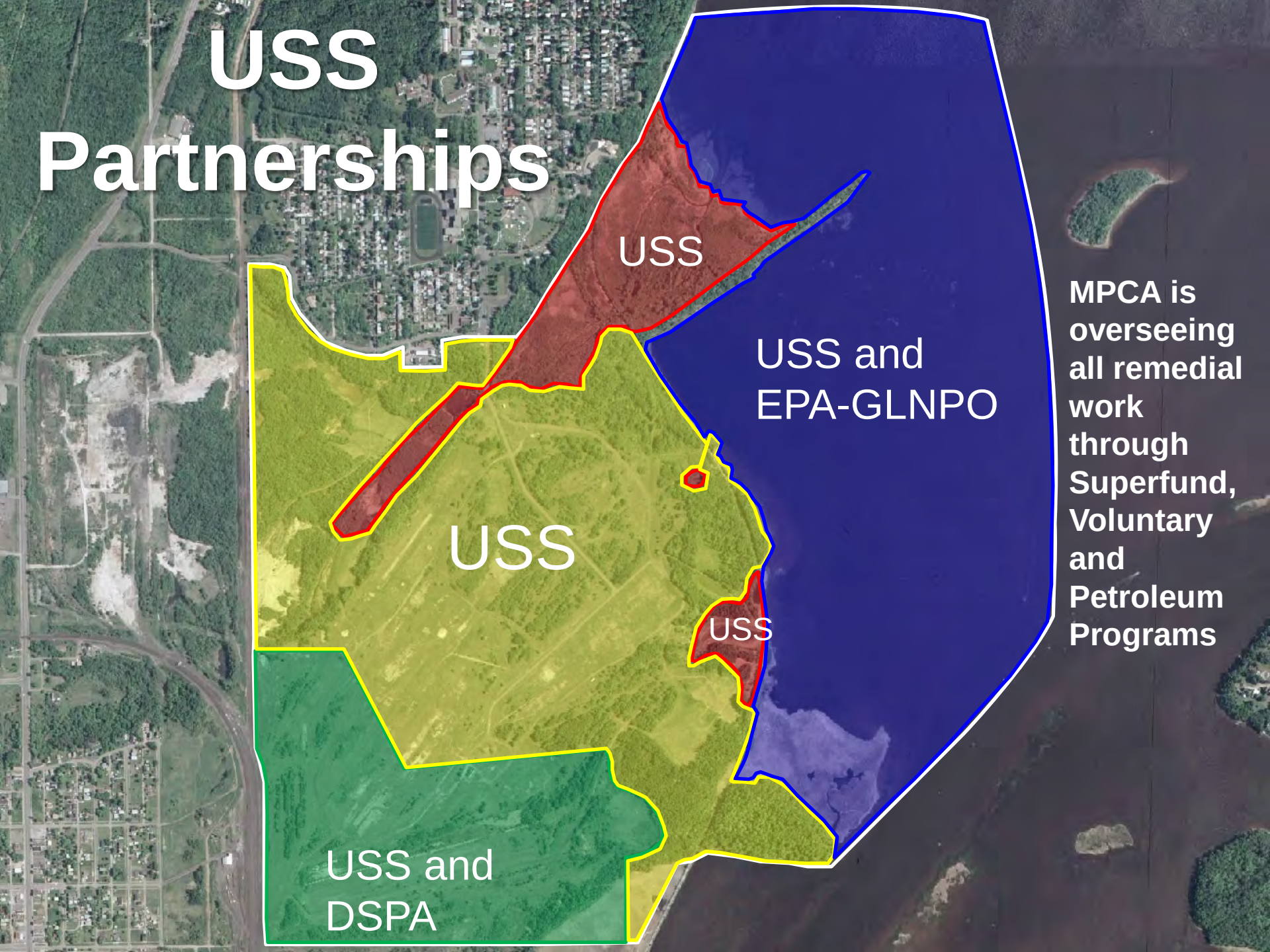
USS Site Current Status

90% of the site is undergoing some form of remedial work (RI, FS, RD, RA)

- **132 acre VIC site** (Duluth Seaway Port Authority)
- **Petroleum site** (Release from 1 million gal. tanks)
- **Sediment Units**
  - Over 350 acres of sediments >1,650,000 yd^3 of sediments are undergoing a Feasibility Study and Response Action (estuary and tributaries)

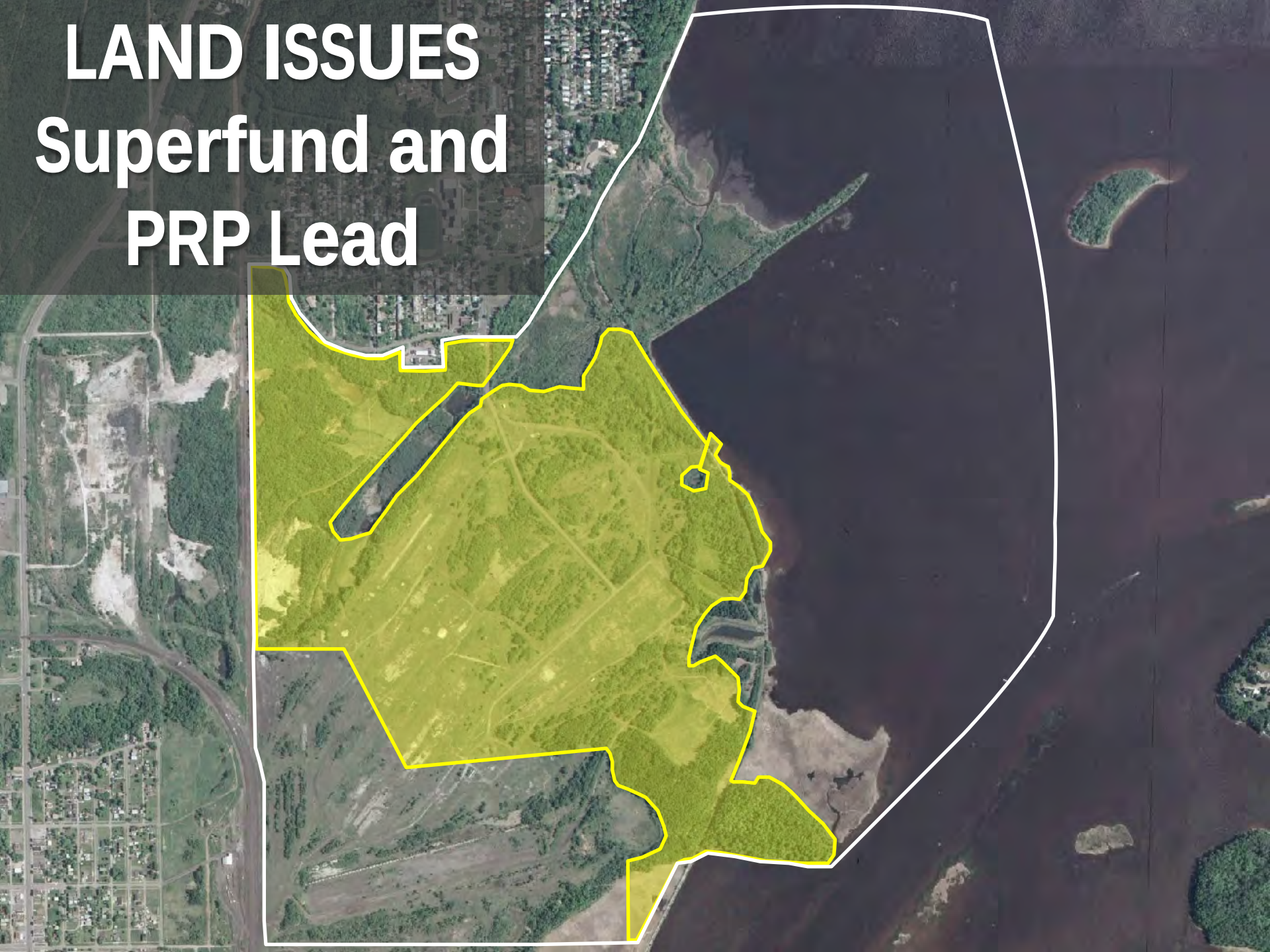
Minnesota Pollution Control Agency

USS Partnerships



MPCA is overseeing all remedial work through Superfund, Voluntary and Petroleum Programs

LAND ISSUES
Superfund and PRP Lead




T1- 4
T10&11
T13
T15


Potential
Development Site
VIC Lead

Potential Development Area Phase II Environmental Assessment

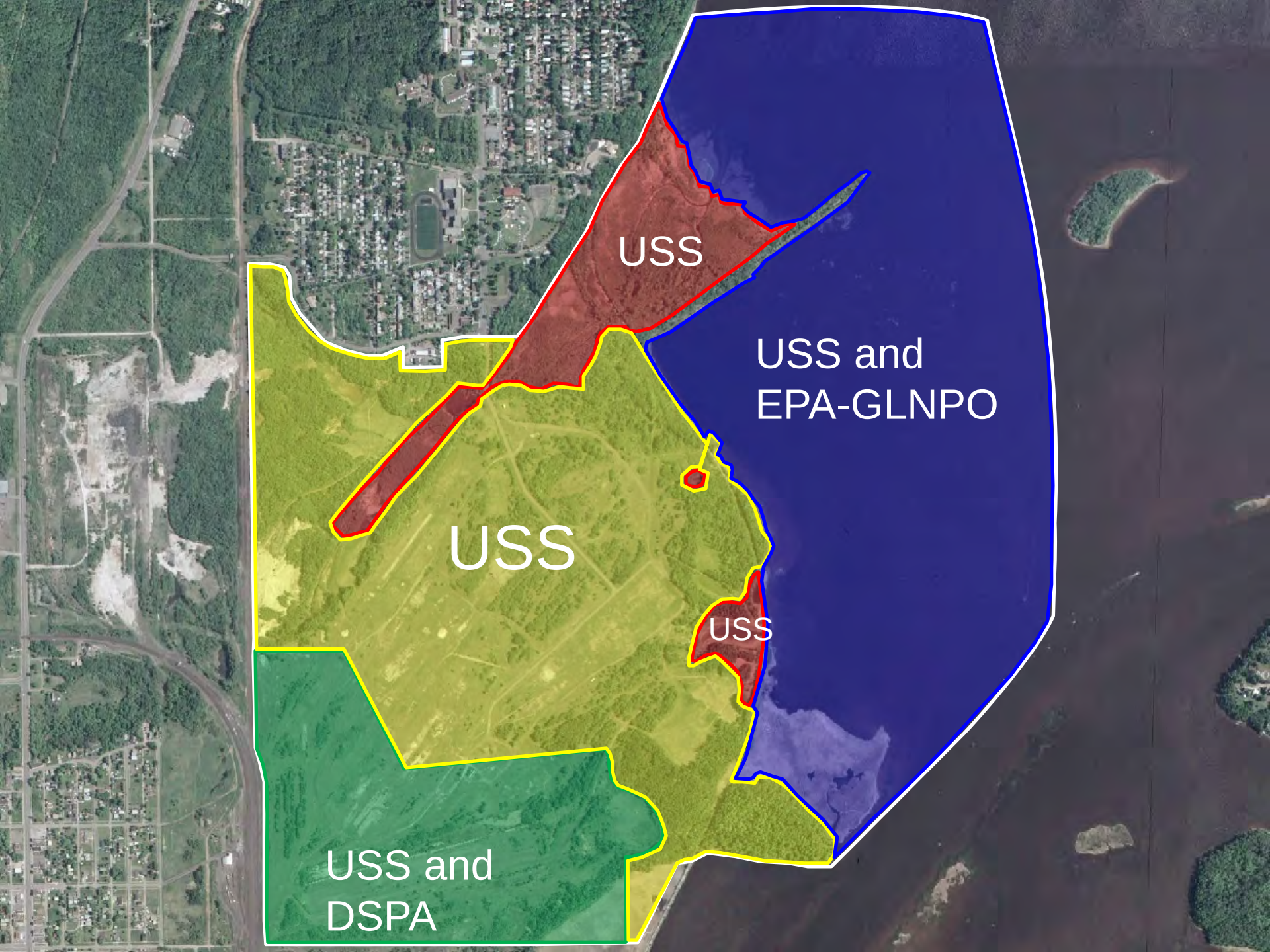
- Investigation work conducted by
  - Ø Duluth Seaway Port Authority
  - Ø US Steel
- MPCA VIC Program Lead
  - Ø Superfund Public Notice and Decision Document

Minnesota Pollution Control Agency

USS Land Issues Next Steps

1. **Tar areas 10 & 11 will be a part of the sediment clean up action**
2. **Tar areas 13 & 15 and other land areas are being investigated**
3. **Tar 1-4 Petroleum site is also being investigated further**
4. **DSPA-50,000 yds^3 of soil to be excavated**
   - all hazardous materials will be disposed of off site (8,000 yds^3)

Minnesota Pollution Control Agency


USS
USS and
EPA-GLNPO
USS
USS
USS and
DSPA


Upland
Stream, Basin
&
Wetland
Sediments
Unnamed Creek
Corridor
OUs I, L, M,
Inbetween I/J
Unnamed
Pond
OUA
Tar
Pits
OUP and
OUQ

Coke Plant Settling Management Area


Wire Mill Settling Basin
Management Area


St. Louis River
Estuary
Sediments
OU-N
OU-R

Feasibility Study

Identifies alternatives that may be feasible for addressing potential risks from site contamination and includes:

- Site background
- Site conceptual model
- Project goals
- Technology screening
- Alternative evaluation

Minnesota Pollution Control Agency

Superfund FS Goals and Considerations

1. **The cleanup remedy will protect human health and the environment**
2. **FS must consider the estuary sediment remedial actions and Upland source control**
3. **FS must consider land ownership/future use**
   - § Land-zoned industrial; estuary-improve habitat
4. **Other considerations:**
   - § Preserve upland for future economic redevelopment
   - § GLNPO involvement will provide habitat betterment
   - § Input from the resource managers (MNDNR, USFWS, Tribes, City of Duluth, USACE, SRLA)

Minnesota Pollution Control Agency

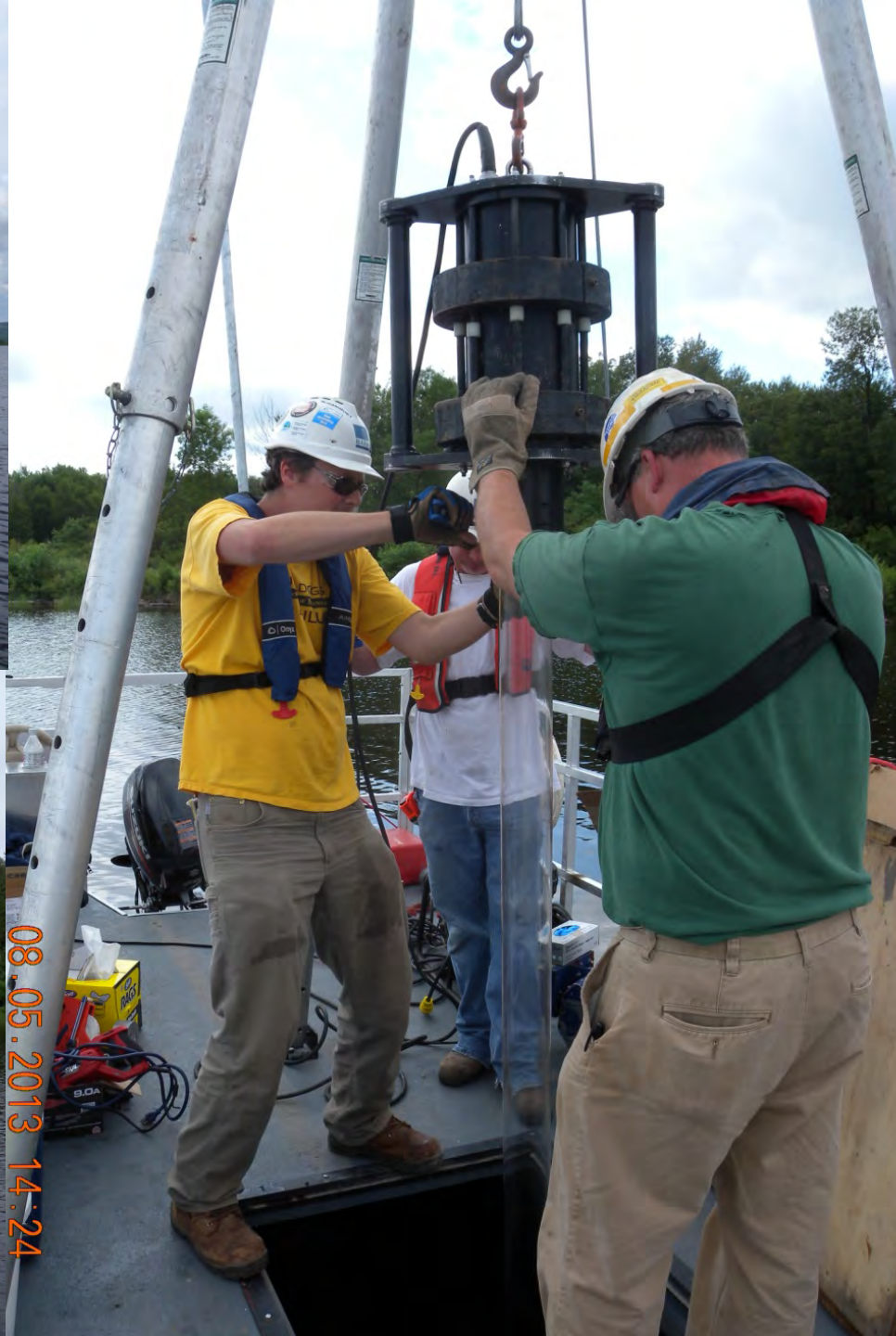
Building a Site Model

- Involves many types of testing
- Data shows site conditions:
  - Extent of contamination-volume
  - Stability of sediments
  - Depth of water
  - Depth of natural deposition cover
  - River flow velocity

Minnesota Pollution Control Agency

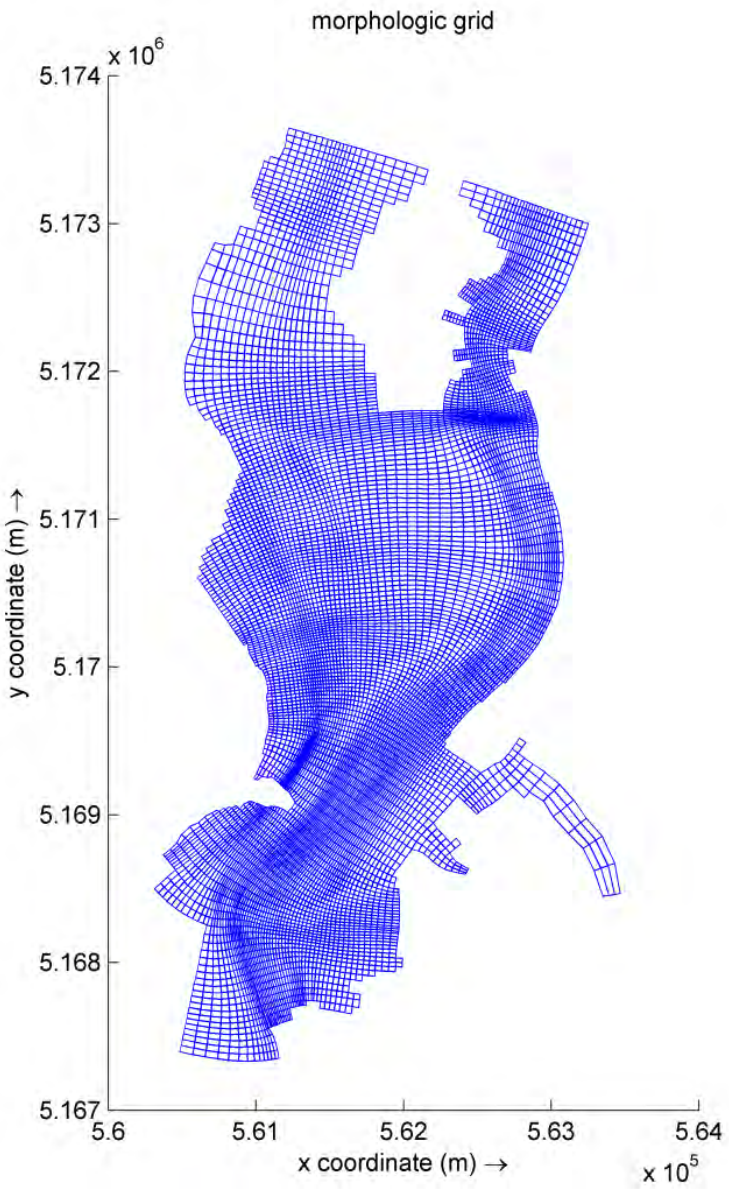

08.06.2013 11:14

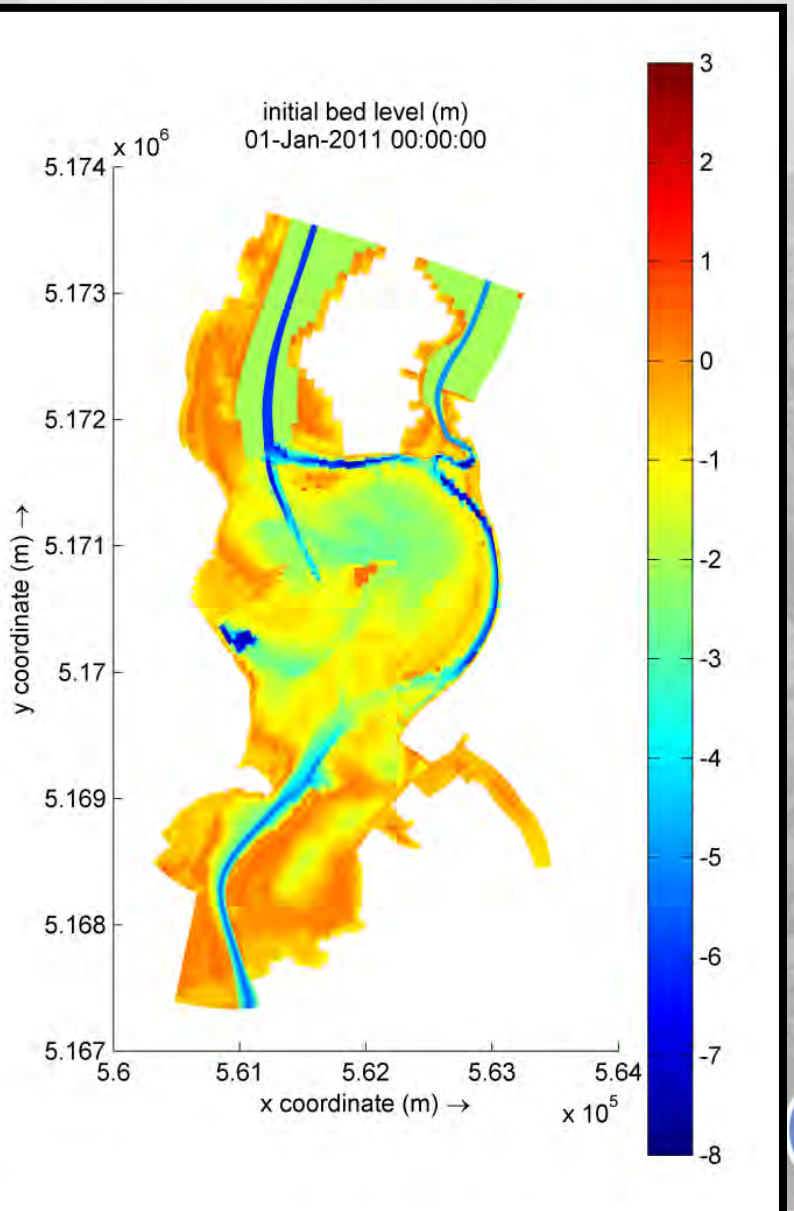

08.05.2013 12:30


08.05.2013 14:24

Investigations: *Surface water flow*

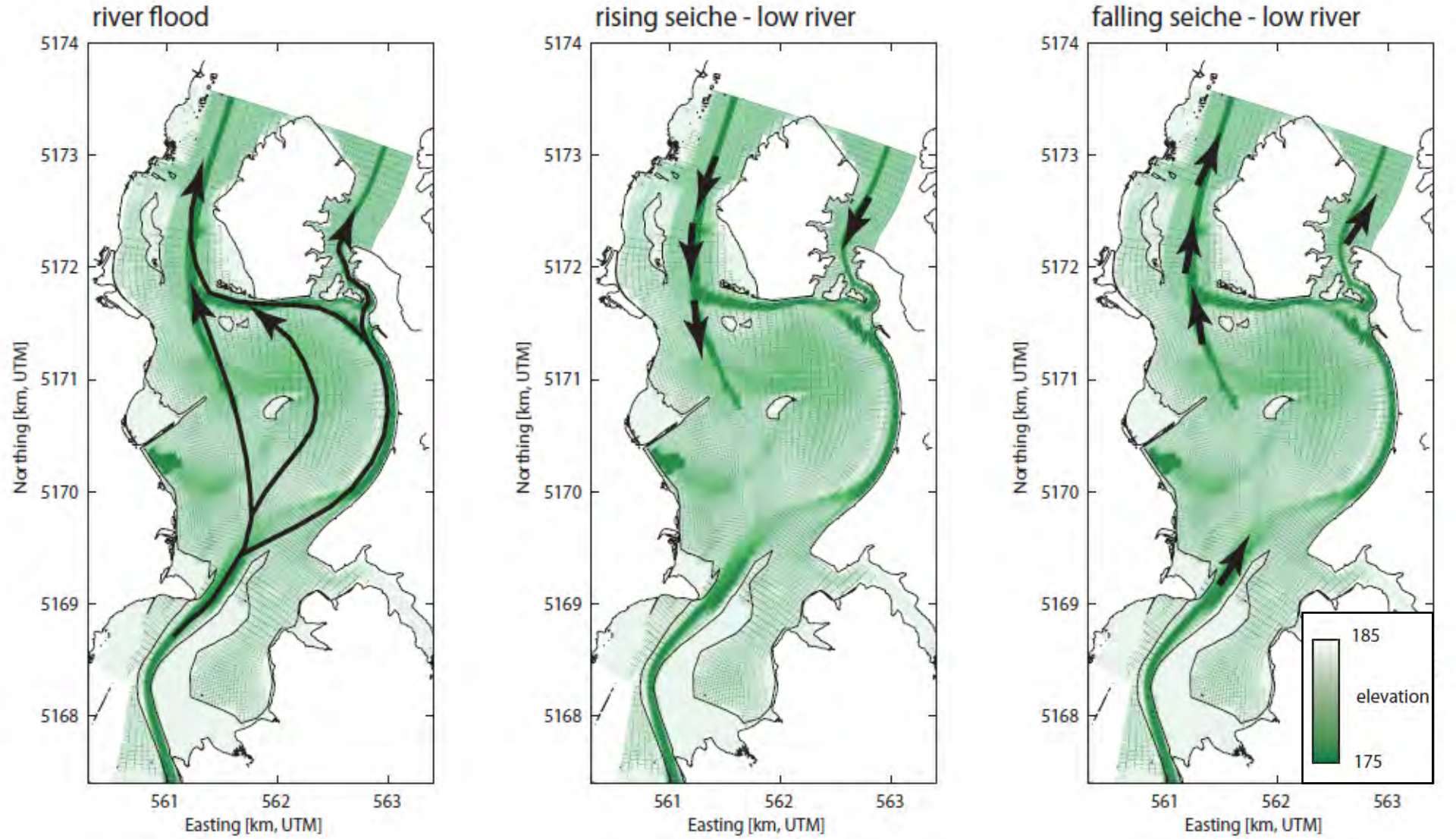
Delft 3D Hydrodynamic Model Grid





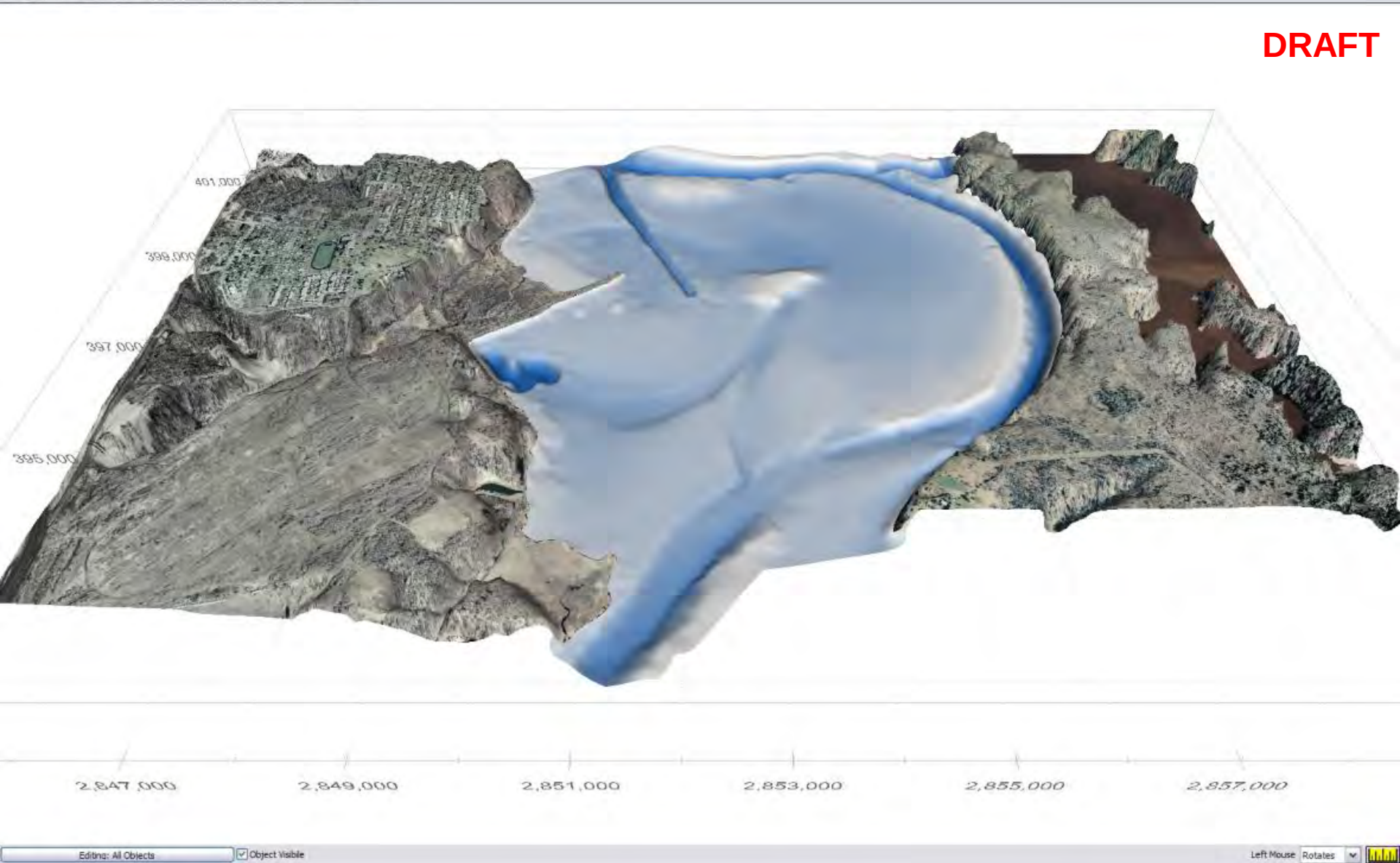
Estuary Hydrodynamics

Dominant flow paths

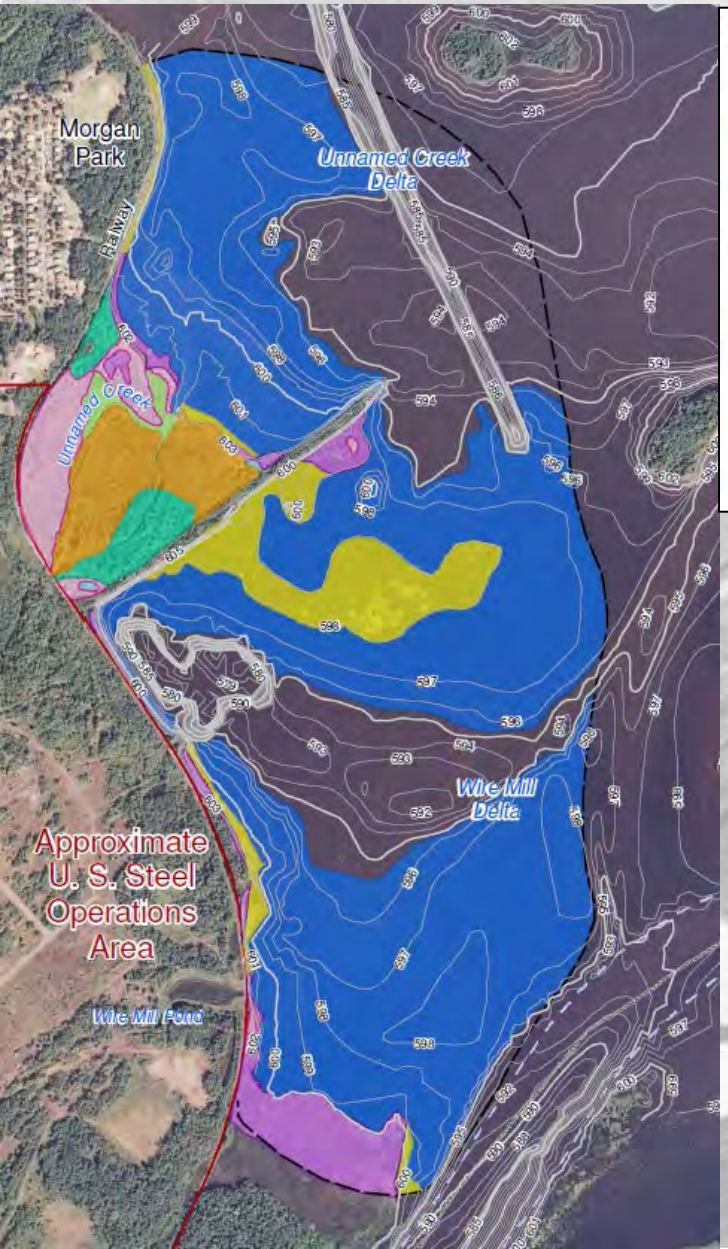


Investigations: *Spirit Lake Site Bathymetry*

DRAFT



Investigations: *Habitat Characterization and Wetland Delineation*



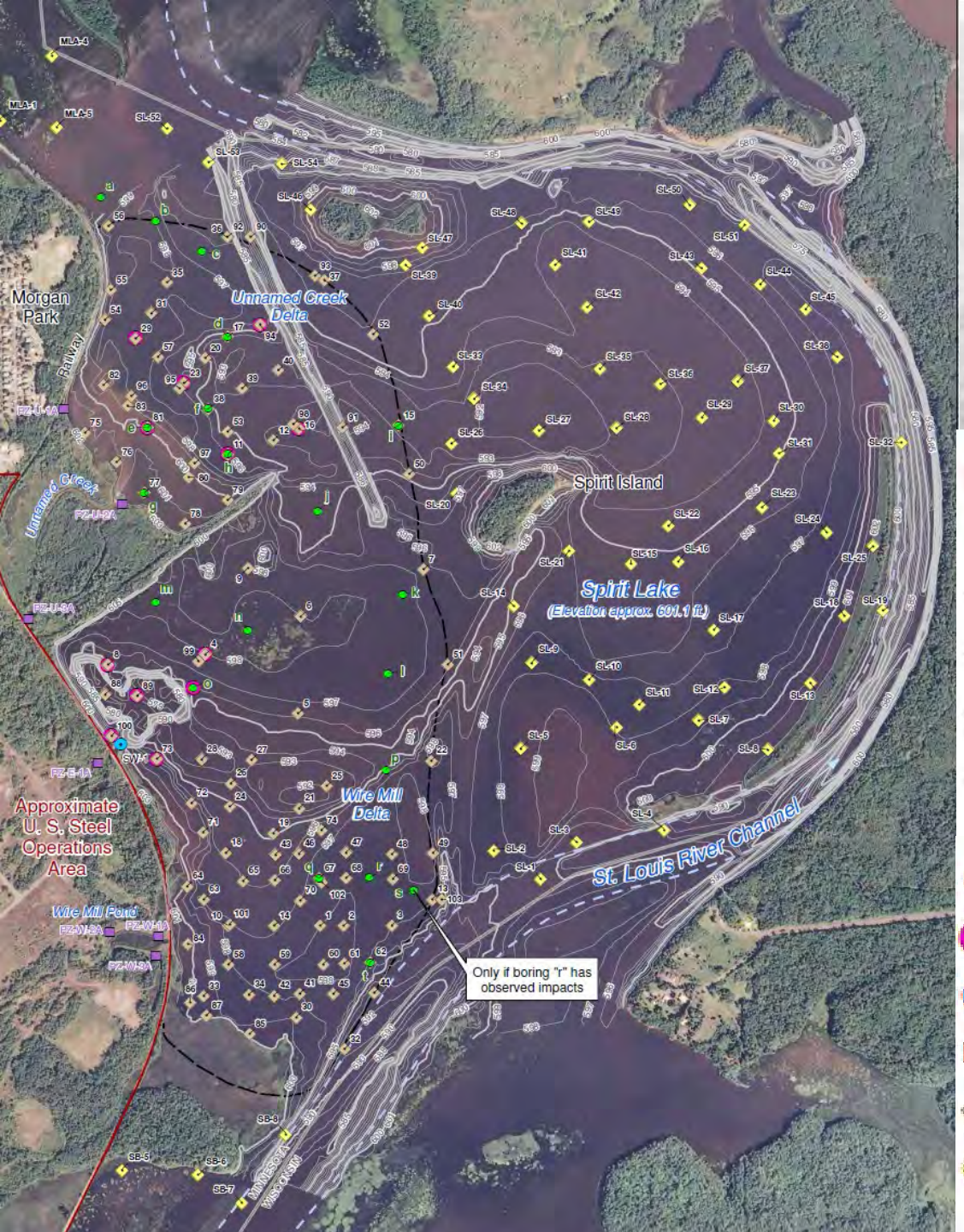
Wetland Communities

- Alder Thicket
- Deep Marsh
- Floodplain Forest
- Open Water
- Sedge Meadow
- Shallow Marsh
- Shrub Carr
- Wet Meadow

Aquatic Vegetation Species at Observation Points (Rake Method)

- Vallisneria americana
- Nymphaea odorata
- Other species*
- No observed species

Investigations:
Sediment Chemical Testing



- Approximate U. S. Steel Operations Area (URS, 2008)
- State Boundary
- Bathymetry Contour (1-Foot)
- Bathymetry Contour (5-Foot)
- Approximate Outer Study Area
- Approximate Location of St. Louis River Channel, Based on Orthophoto Interpretation
- Proposed Core/Boring Locations, Fall 2012 (20)
- Proposed Vane Shear Locations, Fall 2012 (12)
- Surface Water Level Gauge
- Piezometers
- Completed Sample Location (Barr)
- Completed Sample Location (Somat/ACE)

Contaminant Thickness/Natural Deposition Cover

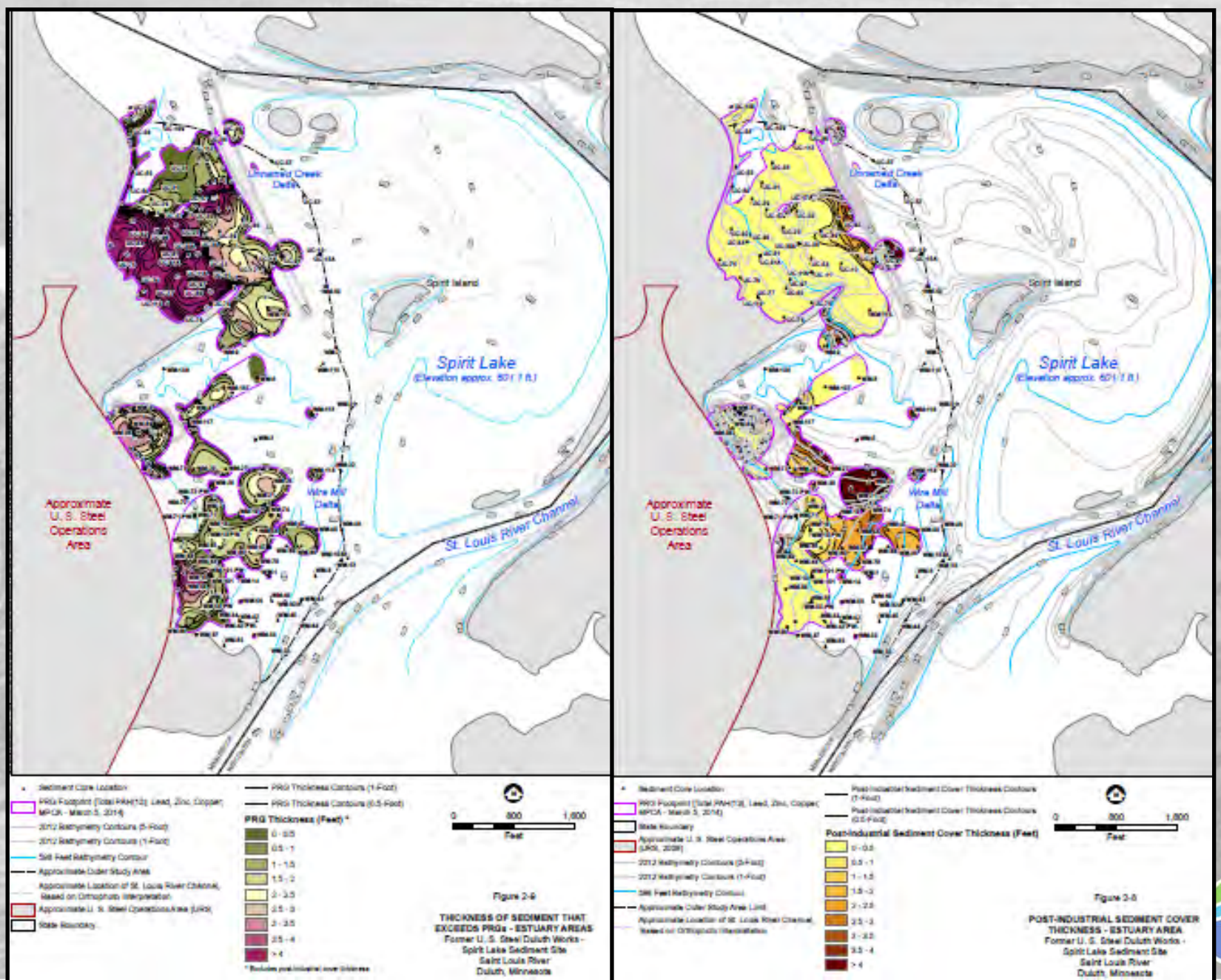


Figure 2-9

THICKNESS OF SEDIMENT THAT EXCEEDS PRGs - ESTUARY AREAS
Former U. S. Steel Duluth Works - Spirit Lake Sediment Site
Saint Louis River
Duluth, Minnesota

Figure 2-8

POST-INDUSTRIAL SEDIMENT COVER THICKNESS - ESTUARY AREA
Former U. S. Steel Duluth Works - Spirit Lake Sediment Site
Saint Louis River
Duluth, Minnesota


1,700,000
cubic yards
Sediment
Contaminant
Extent in
current
Feasibility
Study

Screening Sediment Technical Options

- **Full Depth Dredge/Removal**
- **In-situ Engineered Cap**
  - Cap may include:
    - Reactive Layer, Rooting/Benthic Barriers, Armoring
- **Partial Dredge**
  - to elevation with in-situ engineered cap
- **Enhanced Natural Recovery with Cover/Cap**
- **Monitored Natural Recovery**

- ***Screened out: Bioremediation, chemical treatment (carbon enhancement), phytoremediation***

Minnesota Pollution Control Agency

Screening Sediment Disposal Options

Off Site Transport and Disposal

- All hazardous waste will be taken offsite
- Screened out for non-hazardous materials
  - Ø Volume 300,000 to 3,000,000 yds^3
- Truck traffic, noise, roads, carbon foot print - 30,000-300,000 trucks
- Rail transport screened out due to high dewatering costs

On Site Storage

- Landfill
  - Upland Areas Confined Storage Facility
  - Consolidate within other contaminated areas

- ***Screened out: In water Confined Aquatic Disposal***

Minnesota Pollution Control Agency

Common Remedy Elements

1. **An array of 11 combination alternatives are presented in the draft FS, four are considered in detail**
   - § Consolidation of contamination on Upland units
   - § Dredging, excavation and capping
   - § Natural cover and thin covers
2. **Unnamed Creek will be reengineered to control storm water**
3. **Wire Mill Pond and surrounding dredge spoil piles will be completely removed (OUP & OUQ) creating 7 acres open water**
4. **Unnamed Pond will be completely dredged**
5. **Habitat betterment considerations**

Minnesota Pollution Control Agency

Superfund FS Analysis Criteria

- Overall Protection of Human Health and the Environment
- Compliance with ARARs (applicable or relevant and appropriate requirement)

- Long Term Effectiveness and Permanence
- Reduction of Toxicity, Mobility, or Volume
- Short Term Effectiveness
- Implementability
- Cost

- Community Acceptance
- State/Support Agency Acceptance

Minnesota Pollution Control Agency

Estimated Schedule

Final Feasibility Study: June 2015

Proposed Plan Summer/Fall 2015

- Public Comment
- Public Meeting

Design/Permits: Dec - June 2015

Construction: Summer 2016-2018

Minnesota Pollution Control Agency

Public Involvement

The approved Feasibility Study <u>will be</u> available at:

- MPCA webpage
- West Duluth Public Library
- MPCA Duluth office

MPCA will be seeking public comment on the Proposed Plan-Summer/Fall 2015

- 30 day public comment period
- Public meeting
- Sediment response actions

Minnesota Pollution Control Agency

Resources

- **MPCA USS Site Webpage: http://www.pca.state.mn.us/mvri83b**
- **West Duluth Library repository**
- **Documents available on the webpage:**
  - **December 2013 Newsletter**
  - **2013 Five Year Review**
  - **Estuary RI report with appendices**
  - **Habitat Characterization and Wetland Delineation**
  - **Historic reports**

Erin Endsley, erin.endsley@state.mn.us
218-302-6619

Minnesota Pollution Control Agency