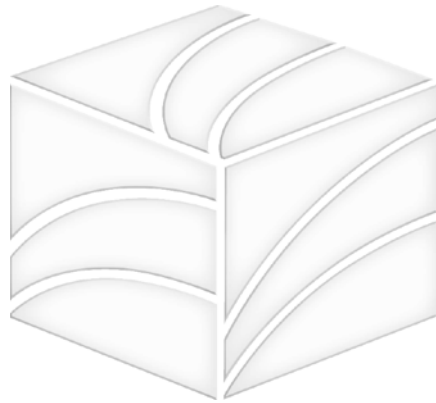


Welcome

Cold Weather Dredging for a Non-Time Critical Removal Action

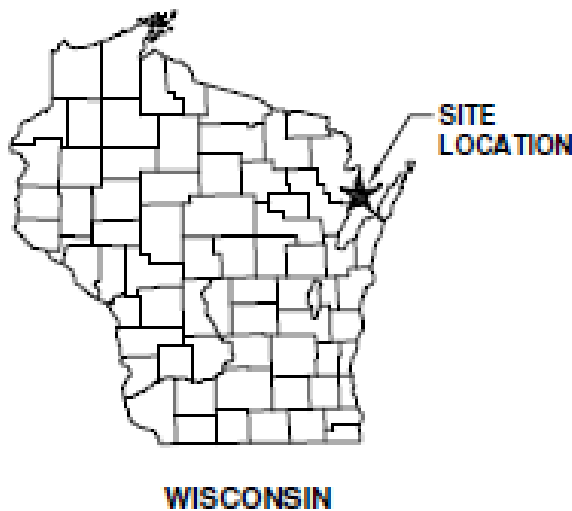
Dan Vachon



WEDA Midwest Chapter 2014 Meeting
Cincinnati, OH April 9-11, 2014



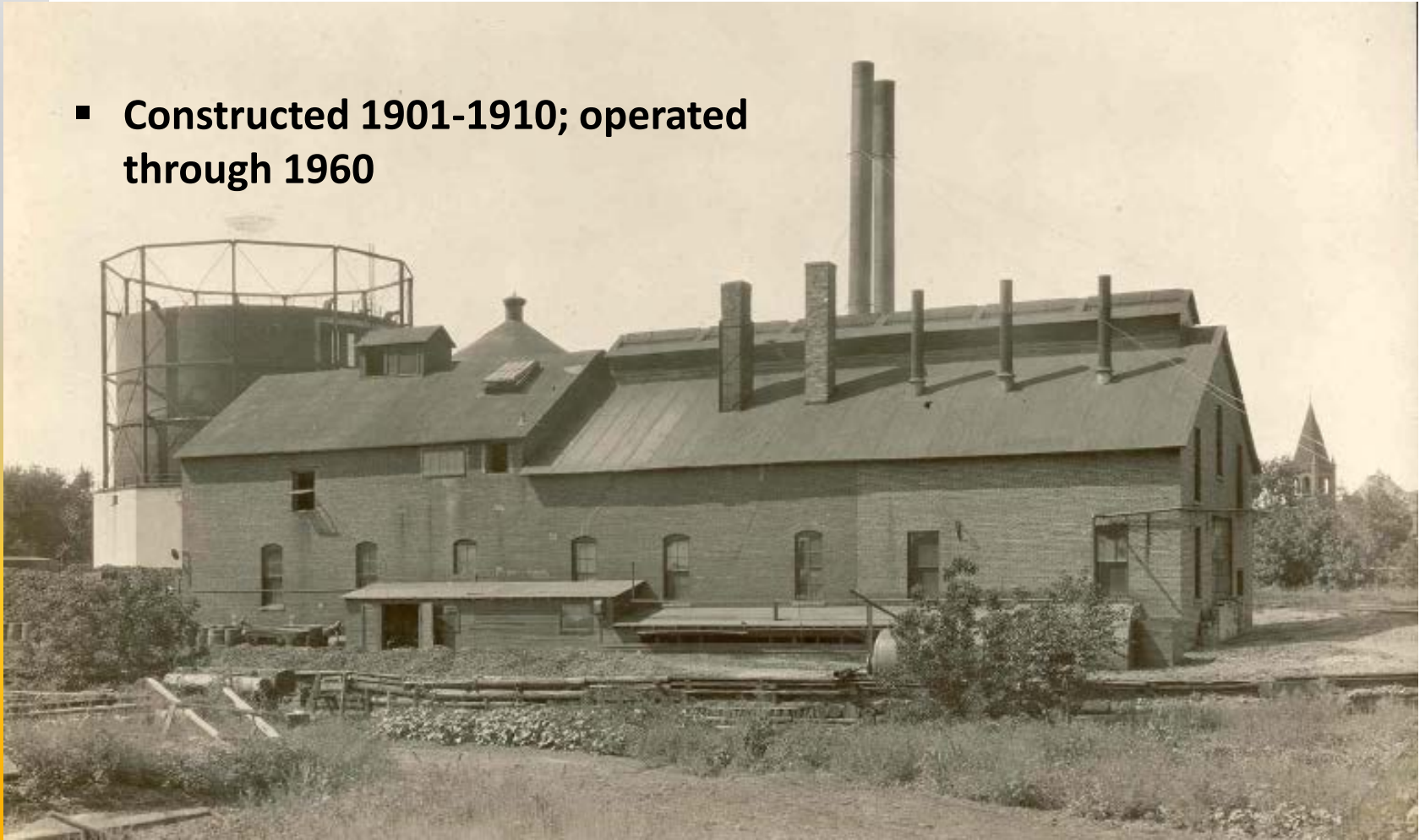
Non-Time Critical Removal Action



- Associated with a former MGP site near the Menominee River in Marinette, WI – Superfund Alternative Site
- Mechanical dredging of NAPL and elevated PAHs in Menominee River sediment to address risks to human health and ecological receptors (purpose for interim action)
- Affected sediment adjacent to a private marina and highly utilized public boat ramp
- Project evolved to address unplanned activities
 - Additional dredge volumes
 - Removal/replacement of sewer outfall
 - Placement of isolation/treatment barriers to address dredge residuals
- Project Team adapted to unplanned extreme cold weather conditions

History of the Site

- **Constructed 1901-1910; operated through 1960**



Before Removal



Work Plan

Plans were approved for:

- Installation of a temporary cofferdam to contain suspended sediment and wood debris
- Mechanical dredging of nearly 7,000 cubic yards of sediment
- Sediment stabilization & de-watering pad construction
- Installation of contact water treatment system
- Disposal of stabilized sediment in an engineered landfill
- Shoreline and upland support area restoration
- Dredging work planned to be completed October-December 2012 to minimize impacts to recreational fishing



Marching Orders

- "We want to make sure Boom Landing will be returned in as good a condition, or better, than when we got it"
- "Significant below-zero temperatures for a prolonged period of time would hamper our efforts, but barring adverse weather, we feel we can make it work"
- "Boom Landing will again be ready for use by the start of fishing season this spring"

-Brian Bartoszek, Wisconsin Public Service Corporation

Cofferdam Installation, Maintenance & Monitoring

- Installed in two phases
 - Installed majority while PAH and navigational dredging occurred outside of cofferdam. Remainder installed before interior NAPL dredging.
- Electric deicer units
- Deflection monitoring survey program



Dredging Within Temporary Cofferd Dam

- Dredging inside the temporary cofferdam began in November 2012 and ended in January 2013
- Two large track backhoes with environmental buckets stationed on work barges
- Dredged sediments were loaded and transported in roll-off box containers on top of transport barges. Sediments off-loaded near shore.



Sediment Stabilization

- Asphalt stabilization pad constructed to:
 - Provide a location to mix dredged sediments with stabilization amendments Decontaminate equipment while minimizing impacts to the soils in the upland support area
 - LOTS of product used (Cal Cement => Portland Cement => Quick Lime)
- Pad consisted of three areas:
 - Pad extension to convey dredged sediments from off-load area to mixing/stabilization area
 - Large section for mixing and stabilizing sediments
 - Load-out and truck decontamination area
- Pad surface was graded for liquids to drain to a sump. Liquids pumped from sump to adjacent water treatment plant.

Contact Water Treatment Plant

- Treatment plant consisted of:
 - Influent & effluent storage tanks
 - Sand and bag filters
 - Oil-water separator
 - 0.5-micron cartridge filter
 - Granular activated carbon vessels
- Discharge parameters:
 - TSS, oil and grease
 - Hg and Pb
 - PAHs and benzene
- Treated and untreated contact water storage tanks were tented with propane and electric heaters to reduce freezing.



NRT's Role – Pre-Construction

- Plan/Perform investigation of sediment contaminants (RI)
- Prepare Engineering Evaluation /Cost Analysis (EECA) for removal action alternatives
- Regulatory agency negotiations
- Prepare plans & specifications
- Procurement support



NRT's Role – Construction Management

- Real-time design adaptations
- Project communications and bi-weekly progress meetings
- Contractor invoice, budget & schedule review
- Community stakeholder presentations and tours
- Deployed/maintained air sampling stations monitoring particulates , VOCs
- Deployed/maintained turbidity buoys
- Analyzed sheet pile wall deflection survey data
- Post-dredge sediment sampling
- Post-stabilization sediment sampling
- Contact water treatment sampling
- Landfill manifest coordination



NRT's Role – Post-Construction

- Coordination and documentation of site restoration
- Preparation of removal action documentation report
- Sand layer and isolation barrier verification sampling



Project Metrics

- Dredge volume: 15,028 cubic yards
- Portland cement stabilization additive used: 1,840 tons (Avg. 7.5% dry additive/wet sediment)
- Stabilized sediment transported to landfill: 24,730 tons
- Comingled wood debris separated and transported to landfill: 357 tons
- Volume of water treated: 113,700 gallons
- Cost: ~\$7,040,000 (including landfill disposal, engineering & construction quality assurance)
- Cost/in situ cubic yard: \$492
- Actual schedule mid-October 2013 through mid-March 2014
 - 5 months

Project Challenges

- Expedited schedule
- Small upland site to support in-water work
- On-the-water work took place during late fall and winter months (November through March); ice caused difficulties with dredging, placing sand, bathymetric survey, and sampling
- Protection of shoreline structures
- Sewer outfall bypass / temporary relocation



Project Challenges - Weather



- Reduced daylight impacted progress
- Small temperatures = BIG challenges
- Slippery surfaces – fall down “go crack” or get wet
- Long work hours, decreased daylight and temperatures affected morale

Project Challenges - Weather

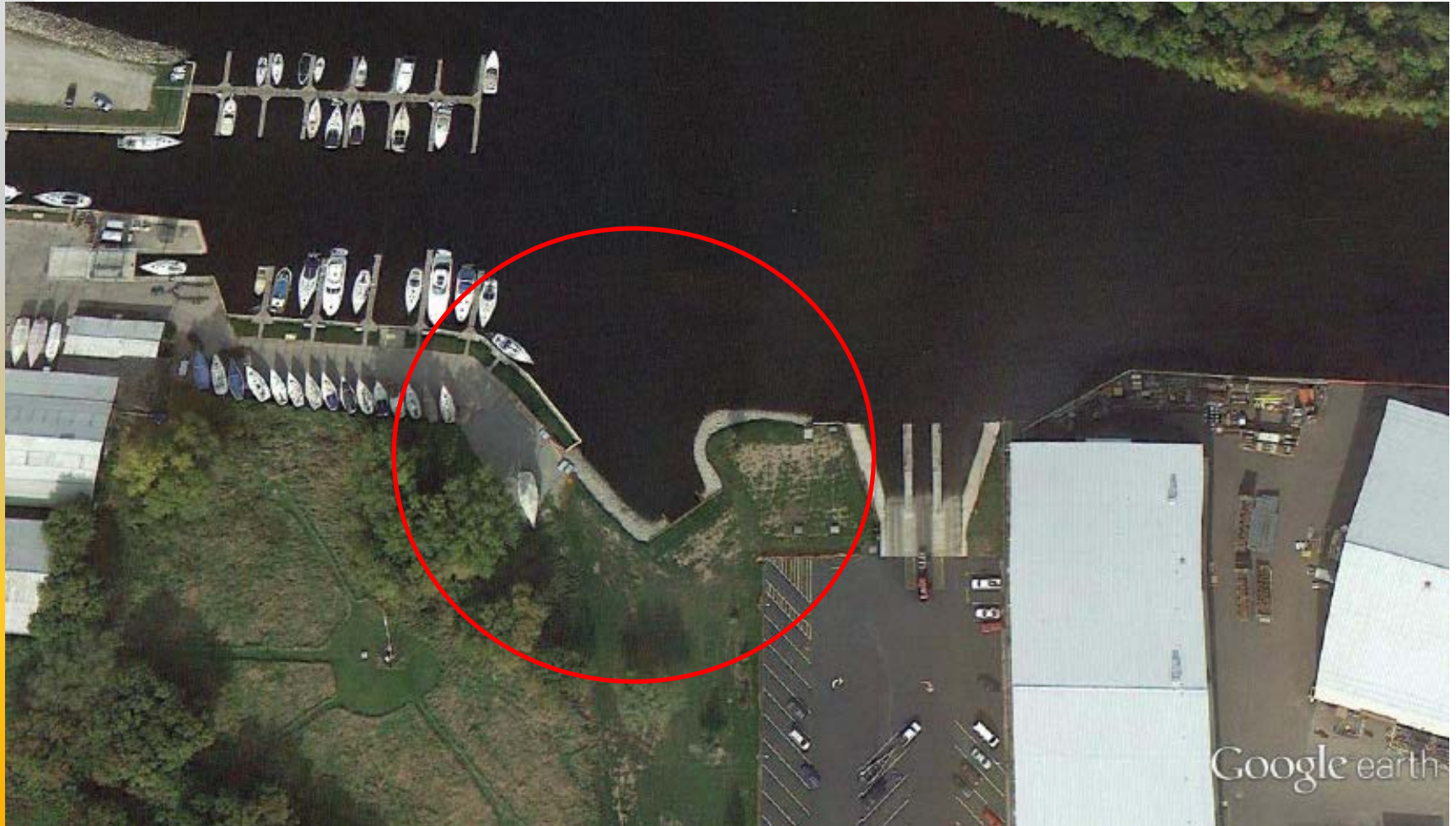


Cold Weather Adaptations

- Work schedule modifications
- Working through or on ice
- Health and Safety meetings twice daily which included physical preparation for cold weather
- Change standard practices for operating equipment
- Thin ice was broken by equipment and boats then consolidated and removed. Thick ice was broken by crane and wrecking ball.



After Removal



Source: Google Earth

After Removal



Source: Google Earth

Acknowledgements

