



Lincoln Park / Milwaukee River Phase I Project – Sediment Remediation to Habitat Restoration



*Western Dredging Association (WEDA)
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Overview

- Remedial Action Summary
- Restoration Goals
- Initial Grade and Restoration
- Restoration
- Challenges Encountered
- Lessons Learned

Remedial Action Summary – Site Description



RA Summary – Project Objectives

- Support removal of BUIs
 - Fish and wildlife consumption advisories
 - Degradation of benthos
 - Restrictions on dredging
 - Degradation of fish and wildlife habitat
- Minimize potential human health and environmental risks
- Improve habitat through restoration



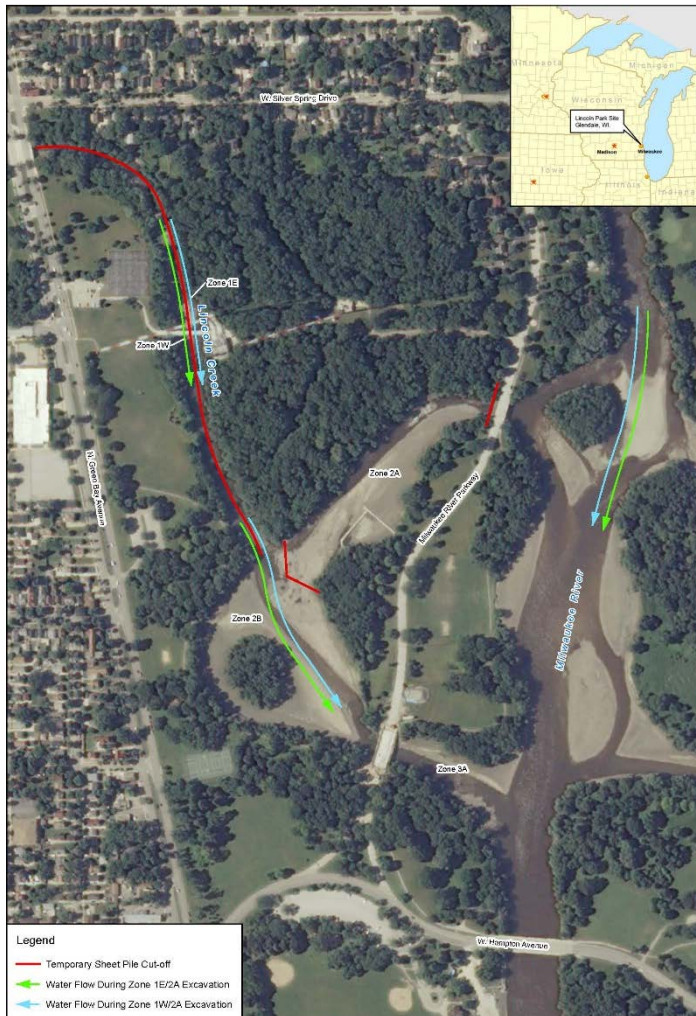
RA Summary – Project Scope

- Pre-Excavation Sediment Delineation
 - Targeted PCB TSCA delineation
 - Results reduced estimated quantities
 - Non TSCA ~95,500 cy from ~119,000 cy
 - TSCA ~1,500 cy from ~14,000 cy
- Mechanical Excavation
- Temporary WWTP
- Post-Excavation Confirmation Sampling
- Final Grading / Habitat Restoration

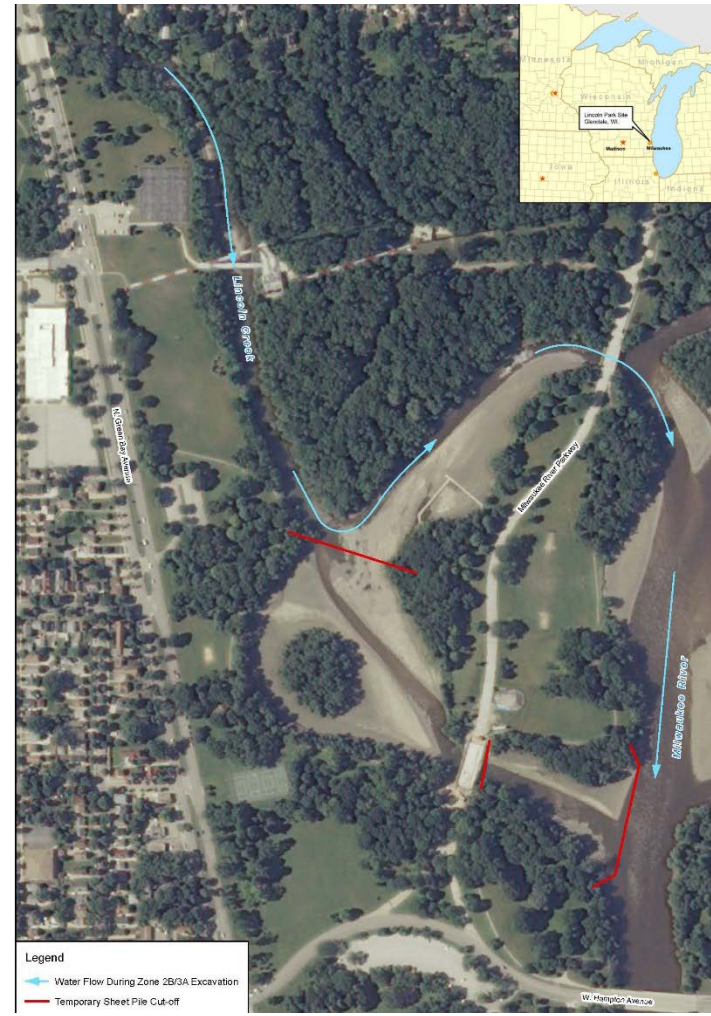


RA Summary – Water Flow / Sheet Pile Isolation

Stage 1



Stage 2



RA Summary – Sheet Pile Isolation



RA Summary – Mechanical Excavation

Zone 1 East / West Excavation and Dewatering



Excavation work in the west side of Zone 1



Zone 1 east dewatering and excavation (11/21/2011)

RA Summary – Mechanical Excavation

Zone 2a – Mechanical Excavation



Excavation of northern end of Zone 2a (10/8/11)



Excavation and hauling of TSCA material in Zone 2A

RA Summary – Mechanical Excavation

Zone 2a – Final Grading / Bank Stabilization



Zone 2A after completion of excavation and bank stabilization activities (11/26/2011)

Zone 2a – Lincoln Creek Diversion



Water flow from Lincoln Creek was redirected through Zone 2A from Zone 2B

RA Summary – Mechanical Excavation

Zone 3a – Southern confluence with Milwaukee River



Excavation of sediments and dewatering activities in Zone 3A (1/5/2012)



Restoration begins on the north bank on Zone 3A, trenching keyways, placing fabric and riprap (1/9/2012)

RA Summary – Removal Quantities

■ Removal Adjustments

- Zone 1 TSCA: 7.7k tons vs. 4.2k
- Zone 2a NAPL: 65.6k tons vs. 46k

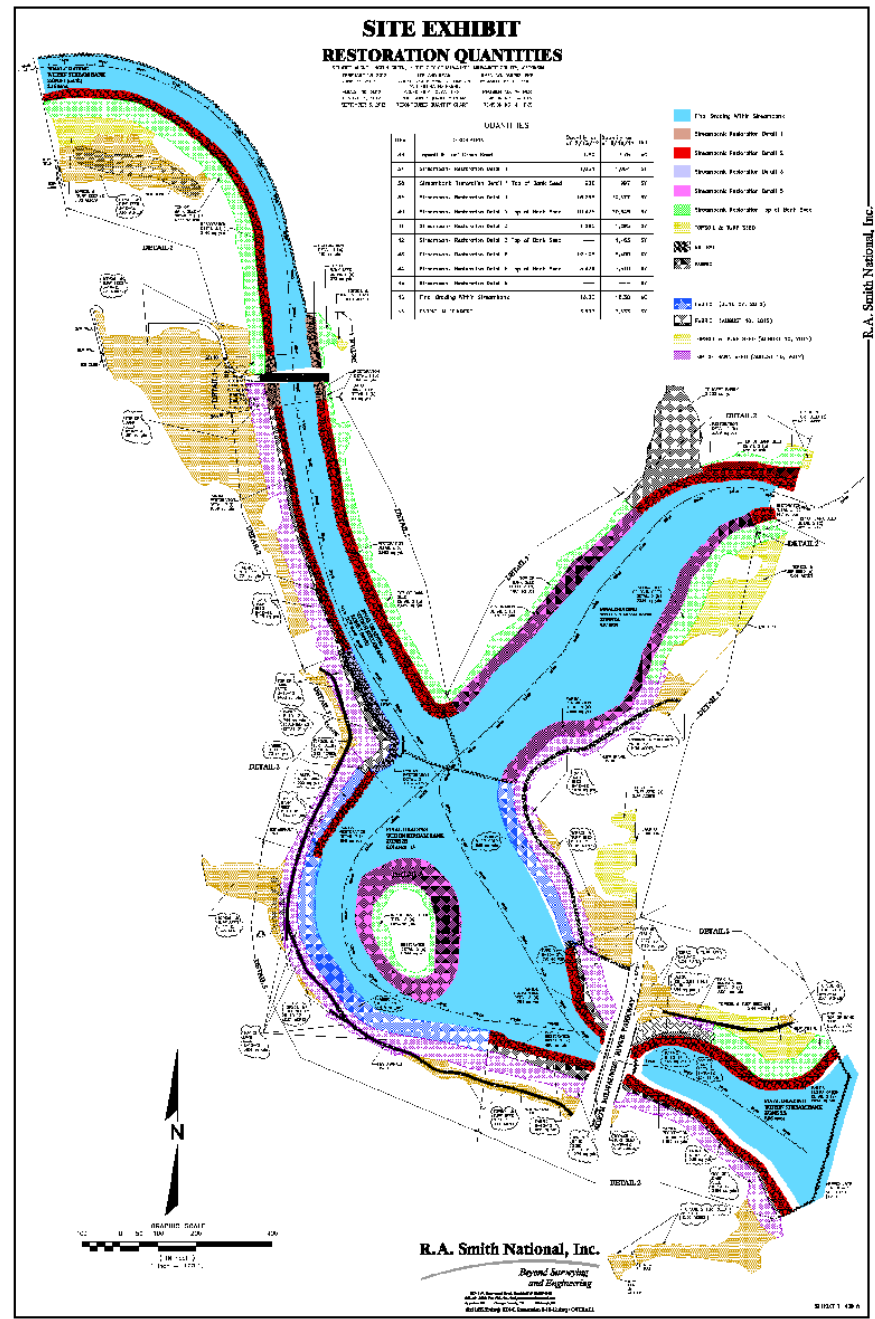
■ Total Quantity Variation

- 119,000 cy removed vs. 95,500 cy
(23,500 cy increase / ~20%)

| Year | 2011 | 2012 | Total |
|--|----------|--------|---------|
| Sediment Volume Removed (yd ³) | 93,483 | 25,556 | 119,039 |
| Sediment Volume Removed (tons) | 156,549 | 44,440 | 200,989 |
| Non-TSCA PCBs (lbs) | 2,777 | 510 | 3,287 |
| TSCA PCBs (lbs) | 1,741 | 0 | 1,741 |
| PAHs (lbs) | 2,787 | 1,248 | 4,035 |
| PAH NAPL (lbs) | 359,249* | 0 | 359,249 |
| Total PCBs (lbs) | 4,518 | 510 | 5,028 |

Restoration Goals

- Turf Grass
- Trees
- Low Grow, No Mow Buffer
- Native Riparian Vegetation
- Brush layer



Initial Grade and Restoration



Initial Grade and Restoration



Initial Grade and Restoration



Initial Grade and Restoration



Initial Restoration Complete So Now We Wait....

- Seeds are Sown
- Fertilizer has been Spread
- Mulch is in Place

The Best Laid Plans Can Have Challenges

1. Geese
2. Drought of 2012
3. Flood of 2013
4. Undesirable Species
5. Leaves
6. Human Factor

Geese



Good Fences Make Good Goose Control



For A While



Drought of 2012



Drought of 2012



Flood of 2013



Flood of 2013



Flood of 2013



Undesirable Species



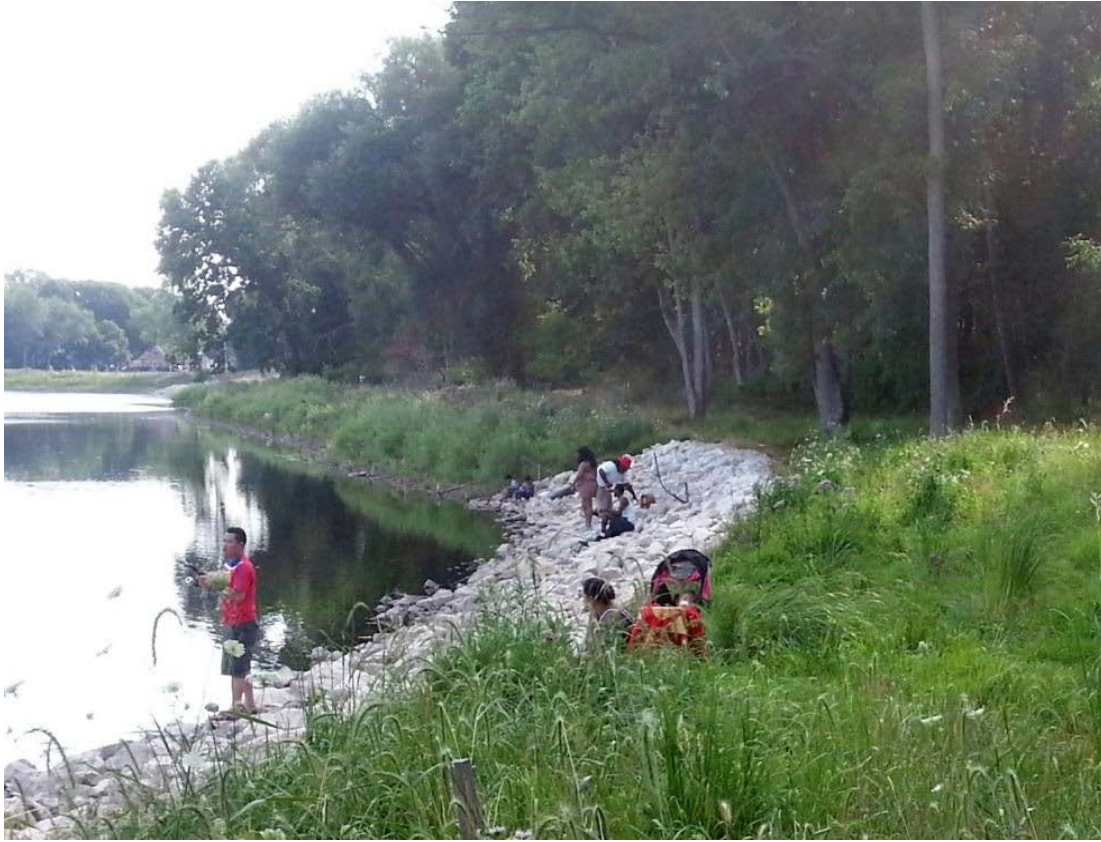
Leaves



Human Impacts



Human Impact



Human Impacts



Time to Regroup



Undesirable Species Management



Undesirable Species Management



Undesirable Species Management



Irrigation



Replanting Efforts



Replanting Efforts



Replanting Efforts



Leaf Matting Removal



From This....



To This...Success!



Success!



Success!



Success!



Success!



Success!



Lessons Learned

- Communication is Critical
- Nature
- Undesirable Species Management (one of the biggest consumers of LOE)
- Human Impacts
- Patience
- Maintenance

Questions / Discussion