

The Atlas Tack Superfund Site: an Example of Ecological Enhancement



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Site Background

- ▶ Atlas Tack Corporation operated from 1901 to 1985
- ▶ Site is comprised of approx. 48 acres
- ▶ Manufactured wire tacks, steel nails, rivets, bolts, and similar items
- ▶ The facility's operations included electroplating, acid-washing, enameling and painting

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Site Background (con't)

- ▶ From 1940 to 1980, wastewater was discharged into floor drains, on-site lagoon and adjacent wetland
- ▶ Solid and liquid wastes were disposed of on-site and also filled in a portion of the wetland

Contaminants of Concern

- ▶ Metals:
arsenic, cadmium, nickel, zinc, antimony and lead
- ▶ Cyanide
- ▶ PCBs
- ▶ sVOCs – mainly PAHs
- ▶ VOCs – mainly toluene
- ▶ Pesticides

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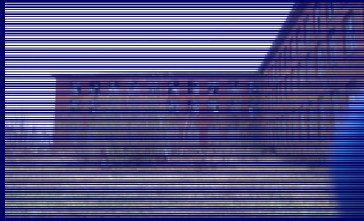
SELECTED REMEDY

Phase I: Commercial Area - 10 acres

- Demolish former one-story building slab, three-story rear building, power plant and two smaller sheds
- Excavate and remove plating pit, pickling trench, underground waste conveyance trenches and dispose off-site
- Excavate 775 cubic yards (cy) contaminated soil and sludge and dispose off-site
- Cost \$2,300,000
- Completed September 2006

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Phase I: Specific Buildings



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Phase II: Solid Waste and Disposal Area – 9 acres

- Excavation and off-site disposal of approx. 38,000 cubic yards of contaminated soil and debris in the Solid Waste and Disposal Area
- Contaminated soil and debris disposed off-site
- Cost \$14,000,000
- Completed April 2007

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Phase III: Marsh Area – 5.4 acres

- Excavation of 20,000 cy contaminated marsh soil and creek bed sediment
- Restoration of the marsh
- Cost \$5,000,000



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Phase III (continued)

- ▶ Marsh excavation scheduled completion May 2007
- ▶ Marsh Restoration begins May 2007
- ▶ Total Site restoration scheduled completion September 2007 (construction complete)

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Environmental Risks

- ▶ Movement of contamination to groundwater, surface water and creek sediment from Commercial Area, Solid Waste & Disposal Area, and marsh surface soil
- ▶ Exposure of biota to contaminated surface soil & sediment in Solid Waste & Disposal Area and Marsh Area and to contaminated Boys Creek surface water & sediment.

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Funding

- Phase I - \$2,300,000
 - ▶ \$552,000 from Hathaway Braley settlement
 - ▶ \$750,000 from MA DEP
 - ▶ \$1,000,000 from EPA HQ
- Phase II - \$14,000,000 – from EPA HQ
- Phase III - \$5,000,000
 - ▶ \$1,500,000 planned April 2007
- **Total \$20,300,000**
- **O&M and LTRA total costs approx. \$800,000**
- Received approx. \$1,000,000 to date from Atlas Tack

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Groundwater & Restored Wetlands Monitoring

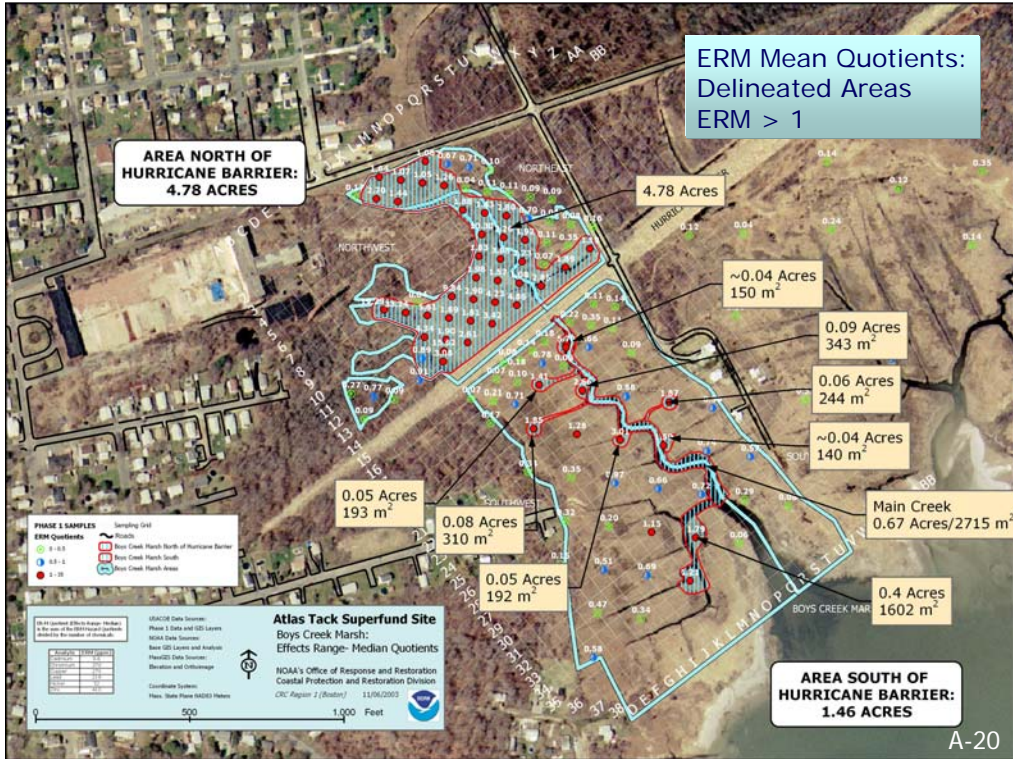
- ▶ Groundwater monitoring is proposed to begin at the start of the cleanup and continue for at least 10 years
- ▶ Phytoremediation (planted trees help remove groundwater contamination)
- ▶ Restored wetlands will be monitored to ensure protection and habitat viability

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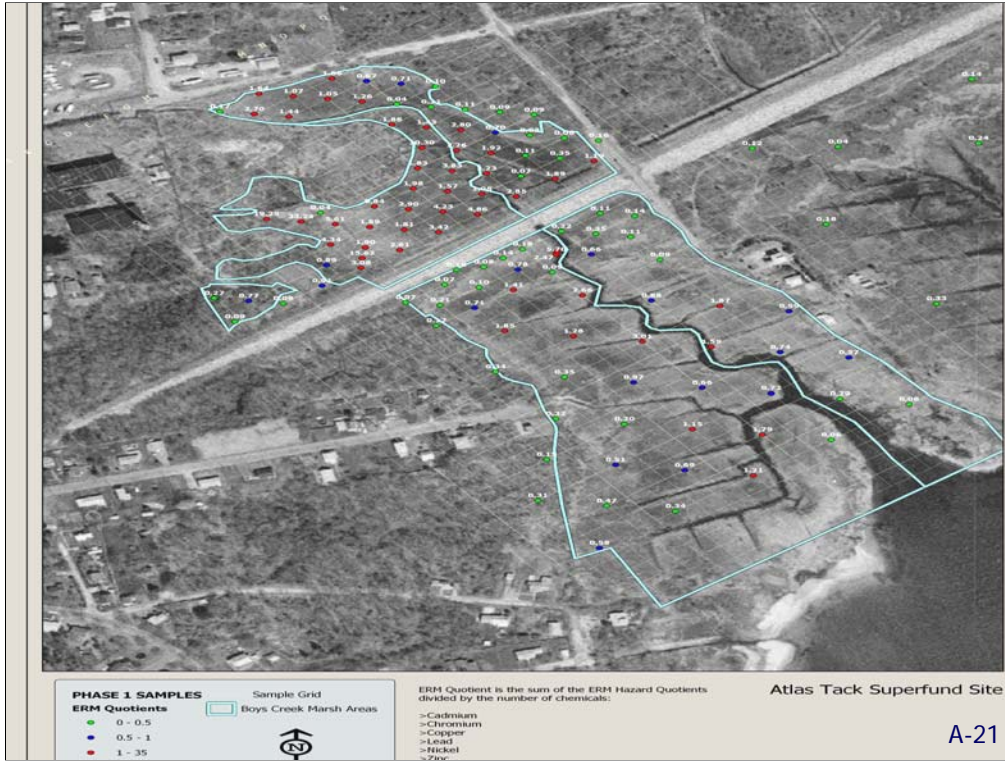
Extent of marsh cleanup
based on results from
Pre-remedial Design
study

(aka: Bioavailability study)

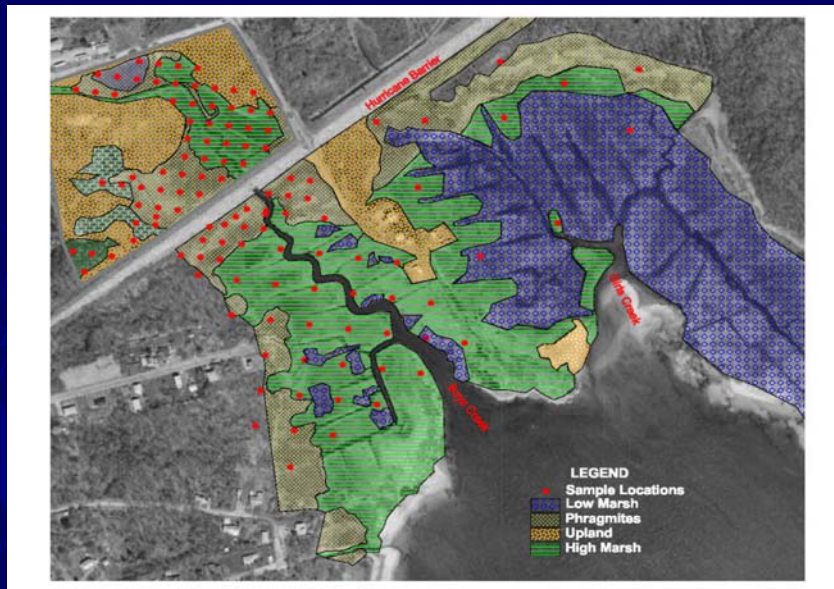
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Marsh Remediation

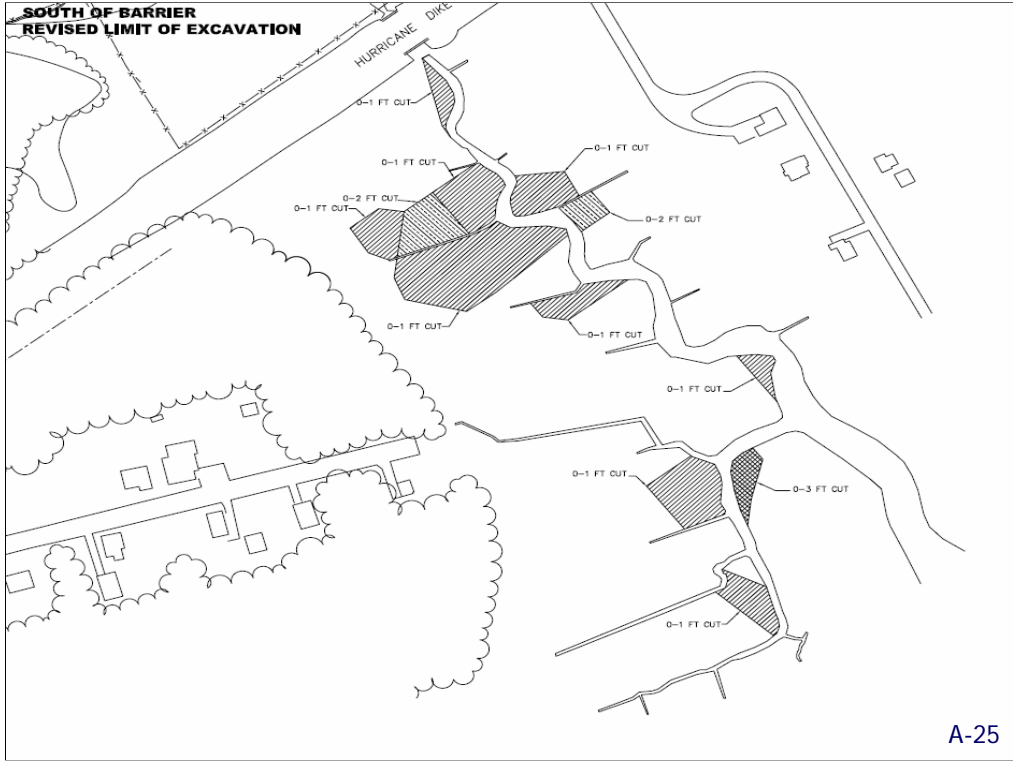


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Atlas Tack – Fairhaven, MA Restoring Wetlands Through Remediation



Restoring Ecological Functions with Out-of-Kind Restoration





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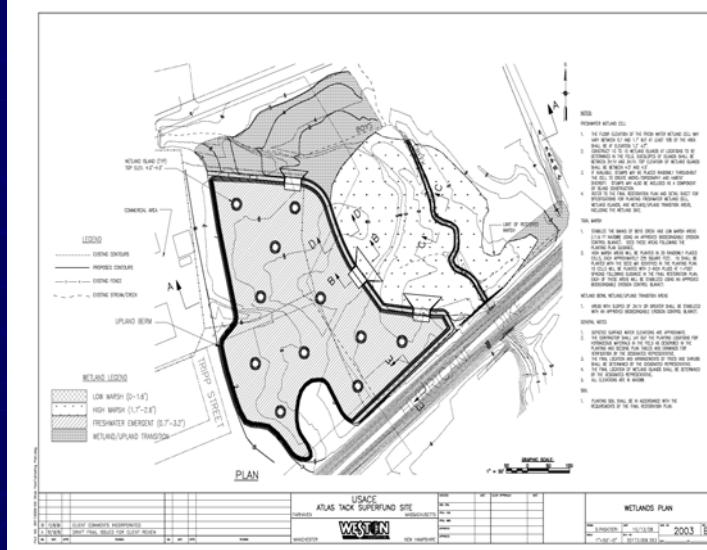
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Ongoing Remediation – September 2006

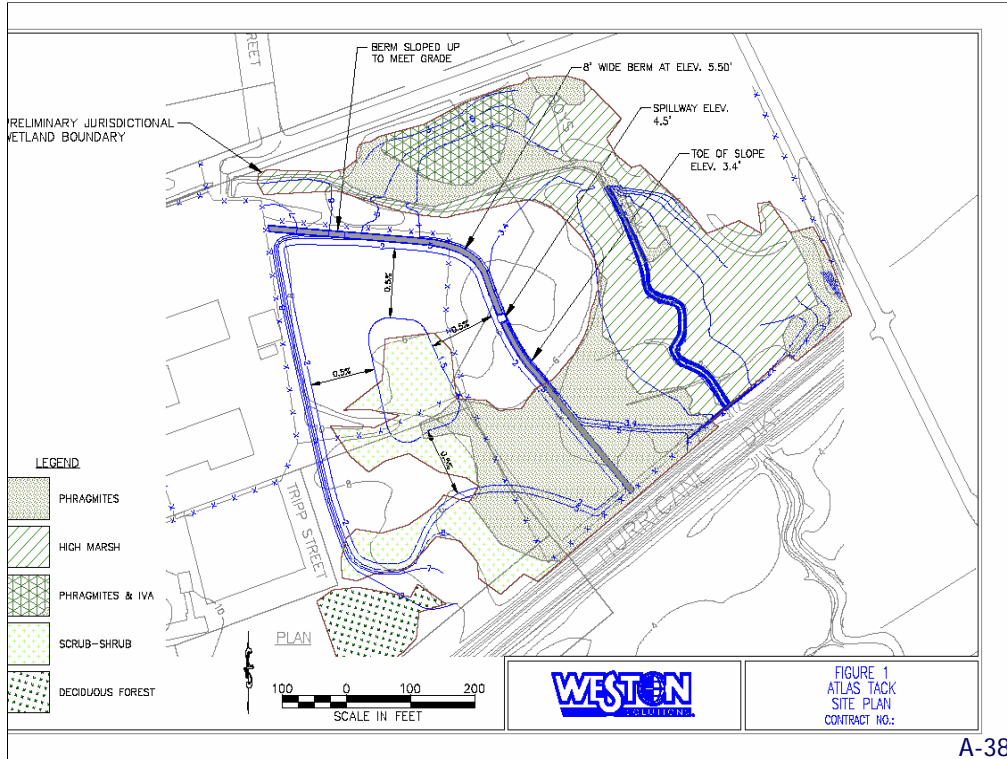


Restoration Plan

- ▶ Fresh water wetland
- ▶ Salt water wetland
- ▶ Phragmites control
- ▶ Islands
- ▶ Man made berm
- ▶ Spillways



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Atlas Tack June Planting



Upland transition area, north of the barrier, east of the creek

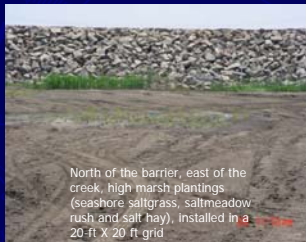


Northwest tributary shaped, seeded with Southern Tier Consulting Mix # 1 and # 4, and stabilized with erosion control blankets

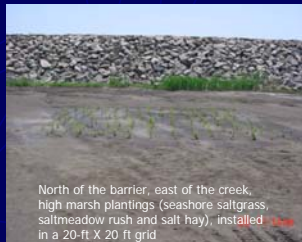
Atlas Tack June Planting



Boys Creek, seeded and stabilized with erosion control blankets



North of the barrier, east of the creek, high marsh plantings (seashore saltgrass, saltmeadow rush and salt hay), installed in a 20-ft X 20-ft grid



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NOAA Restoration Center What do we do?

- ▶ Project identification and development
- ▶ Partnership development
- ▶ Funding
- ▶ Administrative support
- ▶ Technical assistance on feasibility, design and construction details
- ▶ Monitoring
- ▶ Permitology

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Integrating Remediation and Restoration – Some Examples

- Working with EPA and DOD on design assistance on remedial sites to combine remediation and restoration
- Working jointly with EPA and PRPs to achieve cooperative settlement and capture restoration through NRD –i.e. global settlements
- Enhancing or extending restoration above and beyond remediation with other NOAA funds (Community Restoration Program)



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Project Types



Fish passage



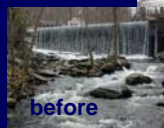
Oyster planting

Remove river blockages
Restore oiled wetlands
Construct oyster reefs & shellfish habitat
Acquire, restore & protect waterfowl habitat
Enhance Public Access

Dam removal



after



before

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4. Northeast Upland Native Warm Season Grass Mix

Code: STCMX-3

\$17.20 Per Pound

1 pound will cover 2,200 sq. ft. @ 150 seeds per sq. ft.

This mix is appropriate in areas where warm season grasses are adapted by virtue of habitat and range of the component species. We do not recommend seeding this mix in areas where the component species are not native. The mix can be modified to be consistent with local floristic requirements. We recommend a seeding rate of 20 pounds per acre.

Percent by No. of seeds (not weight)	Scientific Name	Common Name
49.9%	N Panicum clandestinum	Deertongue
46.5%	N Panicum virgatum	Switchgrass
3.6%	N Andropogon virginicus	Broom Sedge

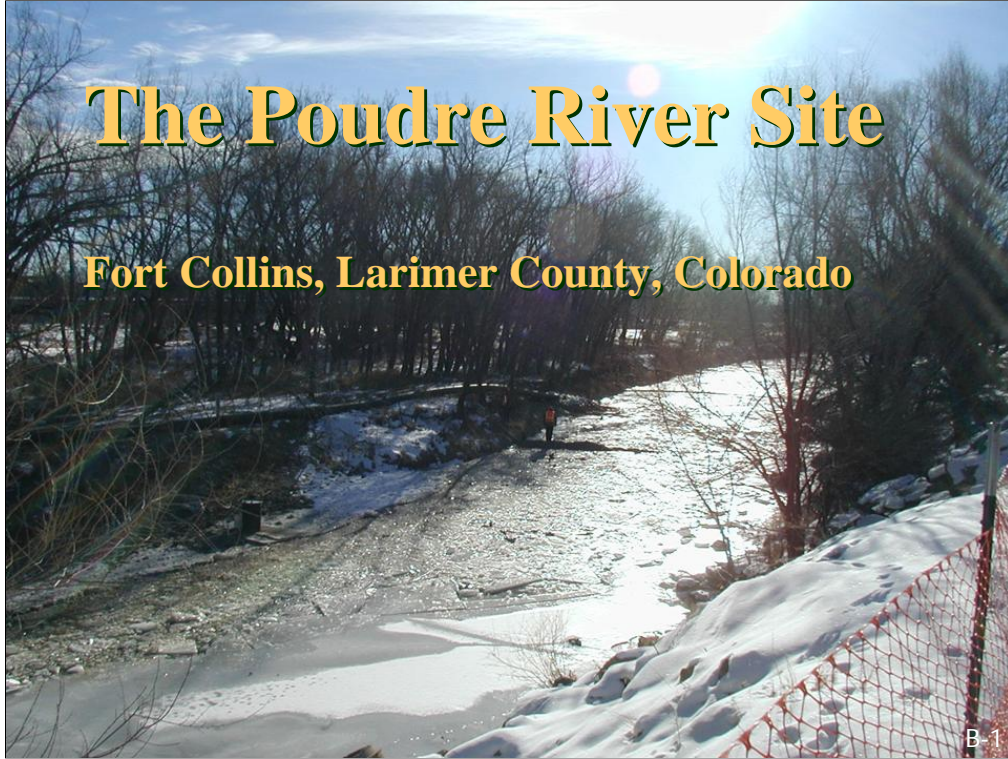
Source: <http://www.southerntierconsulting.com/seedmix.htm>

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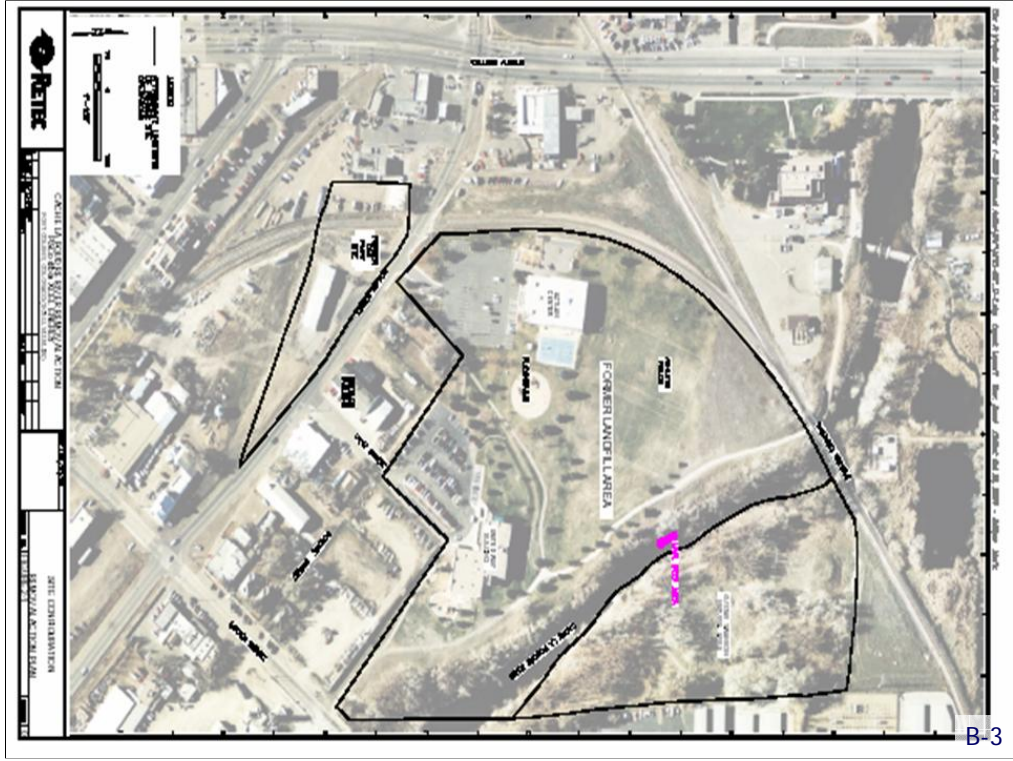
The Poudre River Site

Fort Collins, Larimer County, Colorado

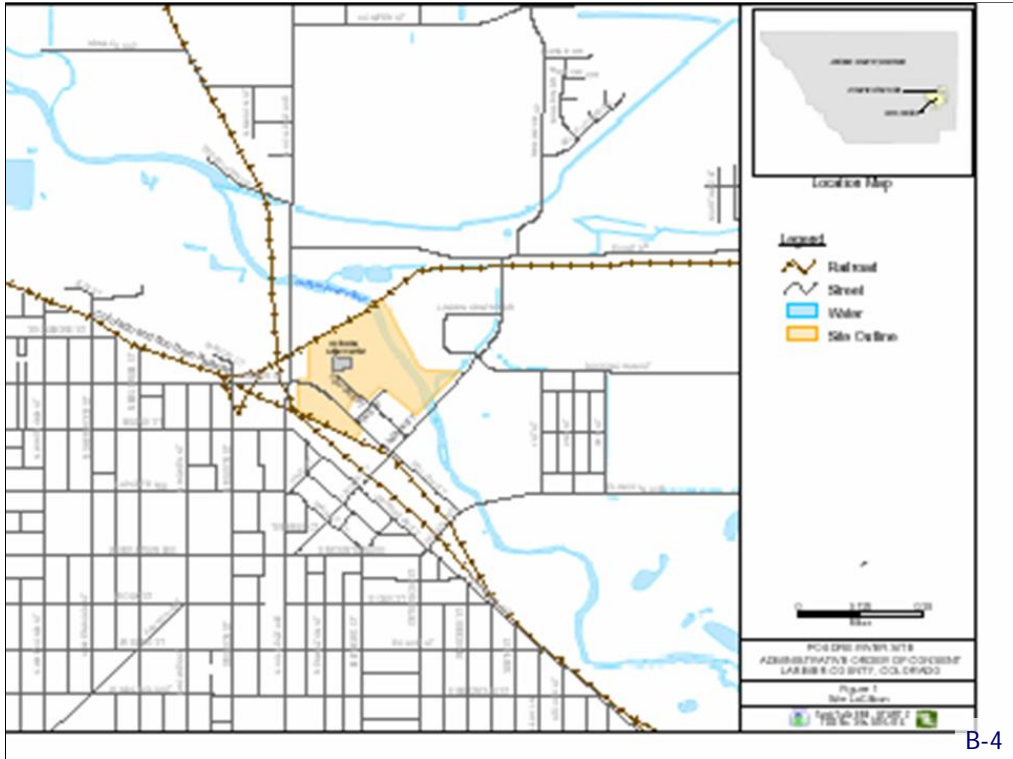




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The Problem

- A Viscous, Oily Liquid (gooey stuff) Was Discovered Emerging from the River Sediments Along a Short Stretch of the Cache La Poudre River

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Site History and Background

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Starting Somewhere In The Middle...

- City of Fort Collins Was Awarded a Brownfields Grant in 2001
- Fort Collins Wanted to Expand an Existing Community Center Over an Old City Landfill
- City Initiated an Investigation Targeting the Potential Impacts of the Landfill and the Surrounding Area on Indoor Air Quality of the Proposed Building

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Brownfields Investigation

- Landfill Operated From the Early 1900 until 1963
- A Manufactured Gas Plant Operated From 1904 until 1927 Immediately Across the Street
- Post 1927 a Gasoline Distribution Business (Including a Gas Station) Operated on the MGP Parcel
- A Machine Shop Operated to the Immediate Southwest of the Landfill

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And Hence in the Groundwater Beneath the Landfill There Was...

- A BTX, MTBE Plume
- A PAH Plume
- A Chlorinated Solvent Plume

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But This Was Alright

- Nobody Used the Groundwater
- The Potential for Vapor Intrusion Could Be Mitigated
- It Did Not Appear That the Groundwater Plume(s) Had a Significant Impact on the Poudre River...Except

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However, The Best Laid Plans...

- In October 2002 a Non-Aqueous Phase Liquid (Previously Not Observed On-Site) Was Discovered In the River
- Subsequent (and Deeper) Investigation By the Brownfields Program Indicated the Problem to Be Fairly Substantial
- The Site Was Referred to the Removal Program in October 2003

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So We Rounded Up Some PRPs

- Public Service Company of Colorado (dba Xcel Energy)
- Schrader Oil Company
- Not the City of Fort Collins (Determined to Be a Contiguous Property Owner Under the Recent Brownfields Amendments)

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And Did A Joint Investigation

- Exploratory Trenches in the River
- Soil Gas Sampling Over the Entire Landfill and River Bank
- Soil Borings and Groundwater Well Installation
 - Landfill
 - Schrader (former MGP) Property

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And We Found

- The NAPL Is Coal Tar, Likely Mixed with Gasoline and Diesel Components
- NAPL Sinks down Through the Alluvium to the Top of Area Bedrock and Traverses Toward the River
- Near the Landfill the NAPL Moves Entirely Into Fractures in the Bedrock, Eventually Accumulating Underneath the River

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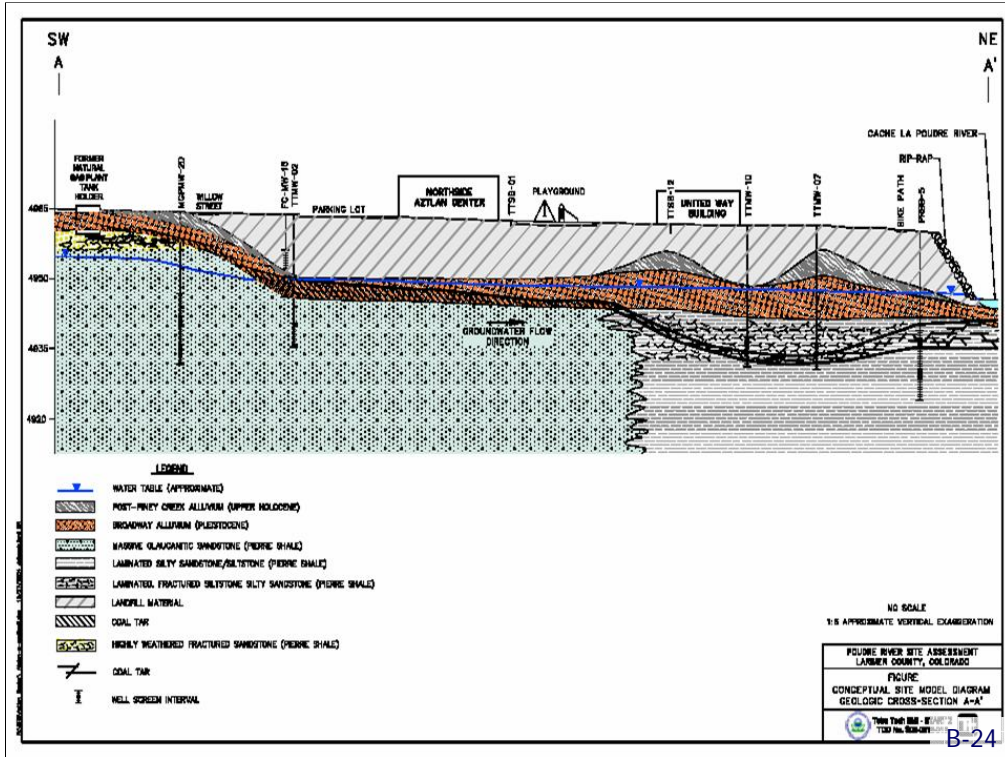


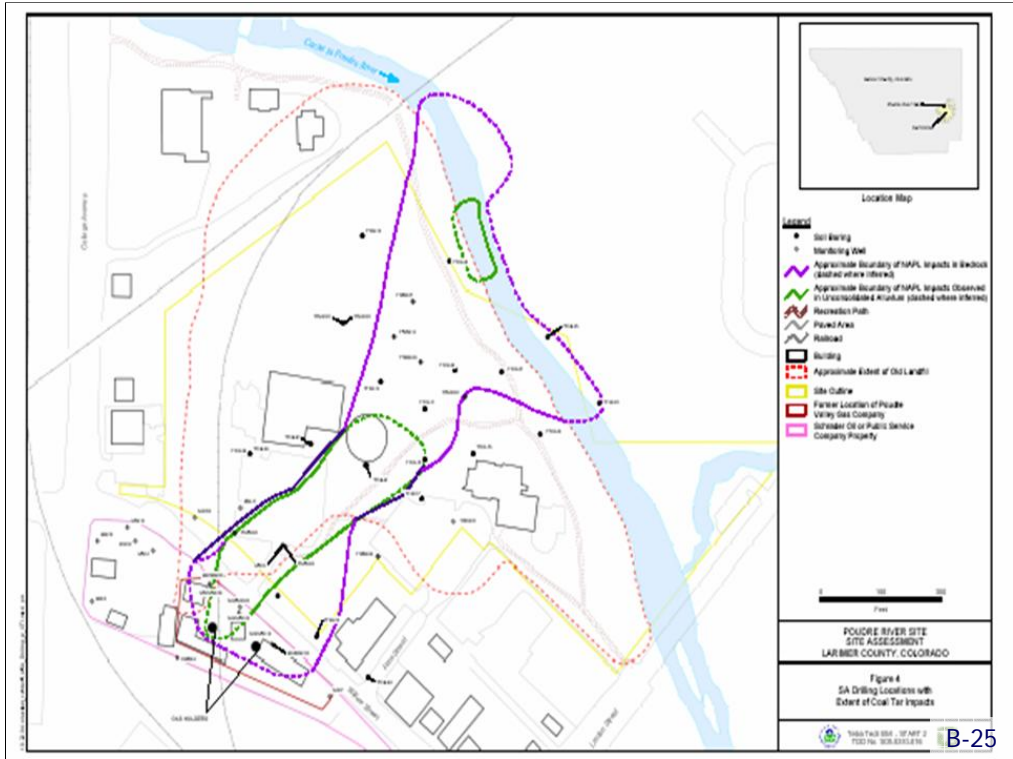


We Also Found

- NAPL in The River Sediments Over a 300' Stretch
- Underneath the River In the Bedrock Over a 600' Stretch
- NAPL Has Migrated Slightly Past the River in Deep Bedrock (20-25' bgs) Fractures

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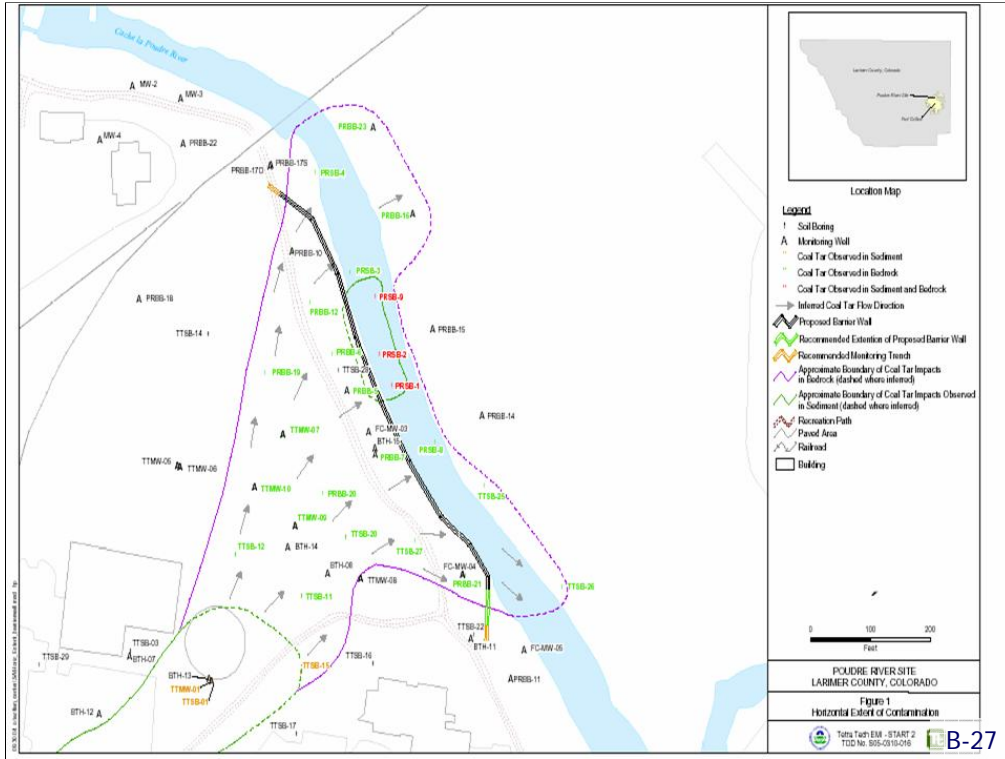


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So... After Some Friendly Negotiations We Decided To:

- Excavate the Contaminated Sediments and Bedrock In and Underneath the River
- Install a Vertical Sheet Pile Barrier with Hydraulic Controls to Intercept the NAPL
- Provide for Long-term Water Treatment
- Not Try to Dig Up the Source Area

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Site Restoration Goals

- Protect and Hide Remedy
- Stabilize the Streambed and Bank
- Replace Invasive Flora with Native Flora
- Provide Appropriate Habitat
- Allow Public Access
 - River
 - Bike Path
 - Nature Area

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Hide and Stabilize

- Design Slope and Bank to Bury Wall and Pump system
- Properly Size and Compact Sub-grade of Streambed
- Restore Original Stream Elevations
- Discretely Armor and Key in Banks to Bed

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Example of Use of Native Species

- Bad
 - Russian Olives
 - Thistle Brush
- Good
 - Coyote Willows
 - Colorado Sedges

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Examples of Habitat Concerns

- Fish Ledges
- Proper Large Trees
- Use of Snags
- Boulders

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Public Access

- Varied Slope
- Flat Bank Along Water
- “Natural” Entry Points to Bank and Trails

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Other Issues

- Establish Acceptable Survivability Up Front, Plan on Some Die Offs
- Warrantee All Plantings
- Watch Out for Beavers!
- Do Plan for Noxious Weed Control
- Final Restoration Will Take a Couple of Years

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