



**Black Lagoon Site  
Trenton, MI**

**First Great Lakes Legacy Act  
Sediment Clean-up Project**

# Black Lagoon Site

Approximately 2-acre exposed cove on  
Trenton Channel of Detroit River

- Part of Detroit River Area of Concern & Detroit River International Wildlife Refuge
- Located immediately downstream of former McLouth Steel plant (closed in 1995)
- Acted as settling basin for past 50 years



# Environmental Monitoring

multiple joint  
sampling efforts

- One of six major contaminated areas of Trenton Channel
- Over 400,000 gallons of contaminated sediment in Trenton Channel



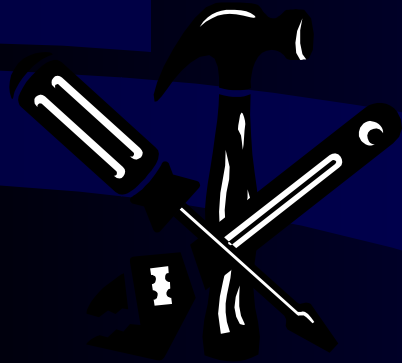
## DIAGNOSIS

Site contribution  
contaminated

- Average contamination
- Average con

- Total
- Mercury: 1.40 mg
- Lead: 146 mg/kg

# Great Lakes Legacy Act of 2002...



...a new “tool” in the  
Great Lakes sediment  
remediation

# Great Lakes Legacy Act

- The Legacy Act authorizes \$50M per year from FY2004 through FY2008 for contaminated sediment projects in the Great Lakes
- Funds can be used for clean-ups, research, and public outreach in AOCs
- \$10 Million appropriated in FY2004
- \$22 Million appropriated in FY 2005
- Black Lagoon Site submitted by MDEQ

# Multi-Agency Cooperative Effort

- U.S. EPA Region V

  - Great Lakes

  - Superfund D

  - Emergency Response

- Michigan Department of Environmental Quality

  - Surface Water

- US Army Corps of Engineers

  - Detroit District & Detroit Area Office

  - Grand Haven Area Office

  - Pointe Mouillee Confined L.



# Multi-Agency Cooperative Effort

- Greater Detroit American Heritage River Initiative
- City of Trenton
- Private land-owners



# Primary Objectives

- Reduce risk to life and limb from aquatic activities
- Restore the aquatic habitat
- Prepare for recreational and economic redevelopment of Black Lagoon

# Black Lagoon Clean-up Plans

Lagoon Isc

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- Mechanical Dredging
- Barge Transport to Pointe Mouillee CDF
- Sediment Solidification at CDF
- Truck Transport to
- Final Sediment Placem

# Lagoon Isolation/Silt Curtain

- Approximately 100,000 square feet of 1.5 mil reinforced vinyl-coated polyester fabric with heat-treated seams
- Fifty foot sections of 8" x 8" x 48" EPS foam block floats
- Initially connected to pipe piles at 50 ft intervals
- Final connection at 10-15 ft intervals with steel beam supports

# Lagoon Isolation/Silt Curtain



# Lagoon Isolation/Silt Curtain



# Environmental Controls

- Oil Spill Protection Equipment at Lagoon
  - Harbor Boom
  - Absorbent Boom
  - Shoreline
  - Work Barges



# Environmental Controls

- **Turbidity Monitoring**
  - 1 Station Upstream
  - 2 Stations Downstream
    - ~ Collect data 2 hours after start of shift
  - Repeat throughout shift
  - Continuous feed units
  - Handheld readings





# Environmental Controls

- Air Monitoring & Sampling
  - Several locations at both Lagoon & CDF
    - Real-time VOCs and particulates
    - Biweekly Sampling for PCBs, Lead and Mercury



# Mechanical Dredging

- Two work
- CAT 235D clamshell for work with environmental
- Long-reach clamshell for work for the
- Material used for
- Weekly soundings conducted for volume measurements (GPS/total station)

# Mechanical Dredging



# Barge Transport to Pointe Mouillee Confined Disposal Facility (CDF)

Sediments  
transport

- Barges hold approximately 1800 cy
- Spill prevention steel plate used for transfer
- Transport barges travel down Detroit River Channel to CDF in Lake Erie

# Barge Transport to Pointe Mouillee CDF



# Pointe Mouillee CDF

Designed to contain contaminated dredged sediment from the Detroit River

- 700-acre crescent-shape dike in Lake Erie
- Structure is 3.5 miles long and 1,400 ft wide
- Constructed in sections from 1976 – 1981
- USACE authorized to manage under River and Harbor Act of 1892

# Sediment Solidification at CDF

Sediments

transpo

CDF

- Solidified sediments off-loaded into off-road dump trucks
- Silt curtain in place around barges
- Sediments off-loaded into either temporary storage pit or directly into CDF cell

# Sediment Solidification at CDF





# Sediment Solidification at CDF



# Truck Transport to CDF

- Project delays  
increased due to conditions
- Transport by barge not possible
- Initiated solidification at Lagoon with transport by truck to CDF
- Continued truck transportation for remainder of project

# Truck Transport to CDF



# Other Weather Considerations

- Turbidity reduction
- Silt curtain  
  - Diver assisted inspections
  - Longer sections of impermeable silt curtain
  - Second layer of permeable silt curtain added
- Ice management in excavation area

# Winter at the Black Lagoon



# Two Layers of Silt Curtain



# Final Sediment Placement at CDF

Cross dike

Lagoon

- Outer CDF walls lined with geotextile
- Overflow weir installed to manage oil/water
- Solidified sediments placed in 12 inch lifts
- Two foot cover material placed on top
- Sediments compacted .

# Final Placement at CDF





# Final Sediment Placement at CDF



# Black Lagoon Site Summary

Cooperative

Dredging occurred over 13 months

- Approximately 115,000 cy of contaminated sediments removed
- Excavated area covered with 6 inches of sand and 3 inches of stone
- Sand bar area created with stone riprap
- City of Trenton received \$113,000 grant for shoreline restoration

# Black Lagoon Contamination

- 115,000 cy of contaminated sediment removed

CONTAMINANT	AMOUNT (in lbs.)
PCBs	160
Mercury	360
Oil and grease	300,000
Lead	
Zinc	

# Black Lagoon Project Costs

- Total cost approximately \$9.3 million
- \$6 million Legacy Act funds
- \$3.3 Clean Michigan Initiative

(The Clean Michigan Initiative is a \$675 million bond used to clean up, protect and enhance Michigan's environmental quality and natural resources).

# Black Lagoon Site Contacts

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# Human Error or Equipment Failure?



# The Resulting Multifaceted Response

