Presentation Outline

- History and Overview
- Contaminated Sediments
  - Nature
  - Aesthetic and Environmental Effects
- Working Toward a Solution
  - Confined Disposal Facility
  - Dredging and Disposal Plan
- Challenges and Summary
Indiana Harbor and Canal

- Man-made channel constructed in the early 1900’s
  - New connection between Grand Cal and Lake Michigan
  - Contributed significant fill into Lake

- Highly Industrialized Region
  - Steel Mills
  - Metal Processing during WWII
  - Petrochemical Processing
  - Regionally Significant Petroleum Refining
Present Day – Approach from Lake Michigan
Indiana Harbor & Canal Present Day

- Maintenance of Harbor and Canal has been delayed since 1972
  - Obstruction to navigation: > 1.5 million cubic yards of sediments have accumulated in Federal Project Area
  - Five miles of navigable channels
  - Annual economic cost of about $15 million

- Awaiting environmentally and economically acceptable disposal alternative
  - Accumulated sediment is considered too contaminated for open water or unconfined disposal
  - IHC is likely most contaminated harbor in the Great Lakes System – meets all 14 of U.S. EPA’s BUIs
Former economic prosperity has left behind the environmentally destructive byproducts of industrial prowess

- **Oil & grease**
- **Heavy metals**
  - Includes arsenic, cadmium, chromium, mercury, lead, selenium, very high iron
- **Nutrients**
  - Ammonia, phosphorus
- **PCBs**
  - Greater than 50 mg/kg in two spots
- **PAHs**
  - Total greater than 200 mg/kg in most areas
- **VOCs**
- **Dioxins and furans, trace pesticides**
Typical Appearance of Indiana Harbor Sediments
Environmental Effects – Aesthetic Degradation
Environmental Effects – Ecological Degradation
Environmental Effects – Fish Tumors/Lesions
What to Do with the Sediments?

The Energy Cooperative, Inc (ECI) Site
- Petroleum refinery from 1918 to 1981
  - Production topped 140,000 barrels per day; some pesticides
- Site requires RCRA corrective action and closure
  - Petroleum in groundwater and soil
- In 1989 the city of East Chicago became owner of the site
- Since 1990’s oil has been observed leaking into Canal from ECI site
  - Since 1992 ARCO has been operating booms and, until recently, a groundwater extraction system

1998 USACE approves Comprehensive Management Plan
- CMP identifies ECI site as optimal location for sediment confinement
  - Mutual benefits to East Chicago and USACE
Former Refinery Circa mid-1900’s
Indiana Harbor and Canal: Project Objectives

1. Restore and maintain the navigable depth of Indiana Harbor and its channels
2. Insure that dredging and disposal activities do not pose an unacceptable risk to the environment or human health during, between, and after implementation
3. Perform the dredging and disposal in a cost-effective manner
How to Achieve the Objectives

- Design and construct Confined Disposal Facility (CDF)
  - State-of-the-art facility built in two stages ("Lifts")
    - Lift 1 – 2.3 million cubic yards
    - Lift 2 – 4.8 million cubic yard total capacity
- Develop a plan to dredge and deliver the sediment to the facility
  - Backlog dredging (7-10 years)
  - Maintenance dredging (20+ years)
- Establish environmental monitoring plans for all aspects of the operation to protect human health and the environment
  - Air monitoring
  - Ground and surface water monitoring
  - Site worker and community health and safety plans
- Continually reevaluate methods and practices
  - Ensure safety
  - Achieve efficiencies wherever possible
CDF Features

- Slurry Wall – 30 ft depth
- South Cutoff Wall
- Gradient Control Sys – 88 wells
- Disposal Cells – 91 acres
- Equalization Basin – 10 acres
- Wastewater Treatment

- Equipment
- Storage
- Admin Facil
- Parking
Indiana Harbor

Federal Navigation Project

- Mechanical dredging
- Barge/hydraulic delivery
- Open placement
- Seasonal water treatment and return
- Site closure/monitoring
Disposal Plan

- Hydraulically offload dredged material from barges into CDF
- Recirculate CDF site water to slurry material to minimize water to be treated
- Prioritize bottom coverage to seal the CDF and decrease seepage infiltration
- Collect and treat all water seasonally
Cross-Section of Capped CDF

- RCRA Cap
- Original Dike
- Dredged Sediment
- Raised Dike
- Slurry Wall
- Groundwater
  - Gradient Control
- Sheetpile Wall
- Sand + Industrial Fill
- Clay Layer

(not to scale)
Challenges

Design
- Project site “unknowns” such as underground obstructions
- Treatment of water for discharge
- Project funding – non-federal

Operational
- Dewatering and drying material to maximize storage capacity
- Volatilization of contaminants and dust control

Public Concern
- Environmental monitoring to ensure health and safety of the community
Completed to date:
- Slurry wall
- Majority of perimeter dikes

Ongoing activities (2008-2009):
- Construction of groundwater gradient control system
- Construction south cutoff wall
- Complete WWTP Design

Next Steps:
- Complete CDF construction
- Continue to develop facility operation and monitoring plans
- Continue to inform and involve the community

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