

# Indiana Harbor and Canal Confined Disposal Facility

2011 Technology Conference

East Chicago, Indiana

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# Topics

- Construction Overview
- Facility Operations/Dredging Contract
- CDF Dam Safety
- CDF Groundwater Gradient Control
- Air Monitoring Update



# Indiana Harbor & Canal

- Federal Navigation project in East Chicago, Indiana
- Identified as an Area of Concern under the Great Lakes Water Quality Agreement of 1978
- CDF has 4.8 Million CY Capacity—1.8 Million CY of this is Backlog Dredging, Remainder is future Maintenance Dredging
- Not dredged since 1972 due to a lack of suitable disposal facility for sediment



# ECI Site Background

- Petroleum products refinery from 1918 to 1981.
- Produced propane, leaded and unleaded gasoline, fuel oil, kerosene, grease, oils, asphalt, paraffin wax, phenols, sulfur, and insecticides.



# ECl Site Background

- In 1981 the owner Energy Cooperative Incorporated (ECI), filed for bankruptcy.
- In the late 1980's, by court order, all buildings and above ground structures were razed. Clean topsoil covered the site.
- In 1989, the City of East Chicago became the owners for back taxes owed by ECI.





IHC CDF Site in the mid 1900's – an active refinery

# Indiana Harbor CDF

Layout consists of  
two cells within  
clay dikes.

Space on the south end  
for support facilities.



# Previously Completed Construction Contracts

- Obstructions Removal – Pipe Removal in the Lake George Canal
- Slurry Wall – 30 ft depth around 3 sides of the site.
- Phase I and II Dikes – Perimeter Dike System
- South Cutoff Wall – Steel Sheet Pile Wall installed in the canal. Sheets vary from 50' - 75' in length.



# Recently Constructed: Phase III Dikes

- Constructed a 1630' long exterior clay dike to enclose the CDF to current height (21')
- Constructed an interior dike to create 2 disposal cells
- Constructed two decant structures to dewater the CDF
- Installed an access road on top of the exterior dike











# Recently Constructed: South End Features

- Construction included site security
- Administrative building
- Maintenance and Storage Facilities
- Parking Lot, Access Roads
- Decontamination Station
- Water main, sanitary tank, storm sewer installation.







# Administrative Building/Garage



# IHC Facility Operations and Dredging

- Contract was awarded on September 30, 2011
- Joint Venture between Kokosing (Durocher Marine) and O'Brien & Gere.
- Currently doing administrative start-up. Onsite activities anticipated in Spring 2012



# Contract consists of:

- Dredging up to 400,000 CY/year based on funding.
- Operation of the Gradient Control System
- Site maintenance
- Water Treatment
- Air Monitoring
- Project website for reporting air and dredging activities

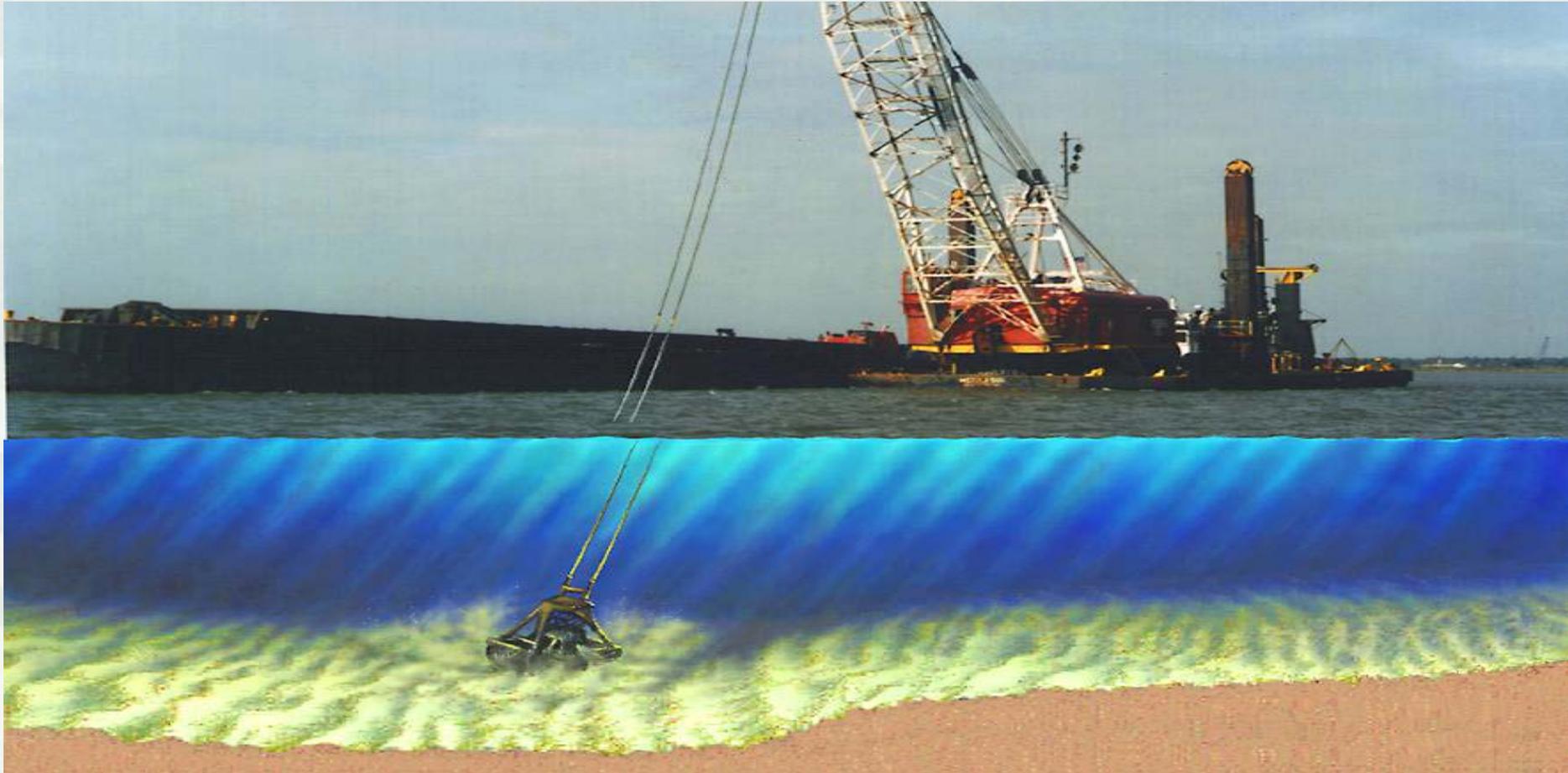


# Dredging and Placement

- Mechanical dredging with environmental bucket
  - ▶ Turbidity monitoring up and downstream
  - ▶ Oil booms around dredging operation
- Hydraulic off-loading with water recirculation from the CDF
  - ▶ Real time air monitoring, dockface air monitoring
  - ▶ Emissions controls at the CDF as needed

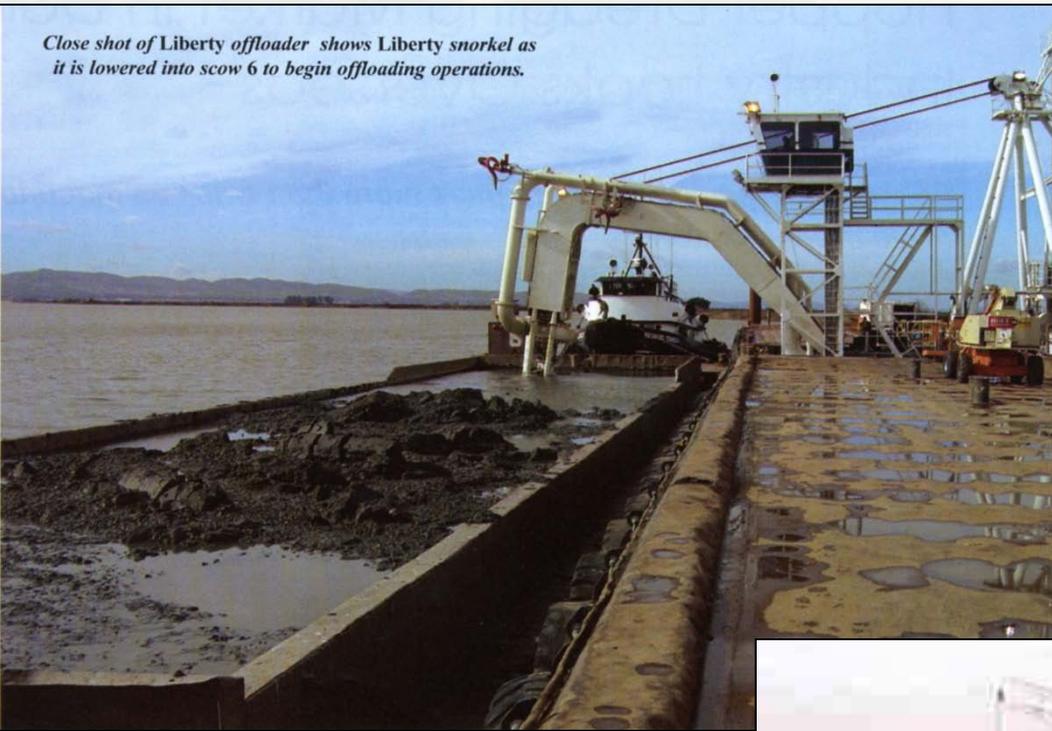


# Mechanical Dredging



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*Close shot of Liberty offloader shows Liberty snorkel as it is lowered into scow 6 to begin offloading operations.*



## Hydraulic off-loading



# IHC CDF Operation

- Ponded CDF (not dewatered during dredging seasons)
  - ▶ Reduces volatile emissions
  - ▶ Eliminates particulate emissions
  - ▶ Improves quality of water in CDF
  - ▶ Reduces amount of water to be treated



# Tentative Schedule

- First dredging event in summer 2012
- Each dredging event may be 2 – 6 months depending on funding
- Year round activities at site: water treatment, air monitoring, gradient operation



# Technology Issues Update



# Dam Safety Overview

- USACE oversees over 650 dams nationwide
- The USACE Dam Safety Program ensures all dams are designed, constructed, and operated safely and effectively under all conditions
- USACE works with a variety of federal, state, and private dam safety officials to build and maintain the Dam Safety Program
- Emphasizes training local personnel on the issues specific to their dam
- This holds the CDF accountable to stringent inspection and operational standards



# On Site Dam Safety Activities at CDF

- Weekly Inspections by Contract Personnel
- Monthly Analysis of Project Instrumentation
- Annual Inspections by USACE Personnel
- Communication Plans
- Site Training



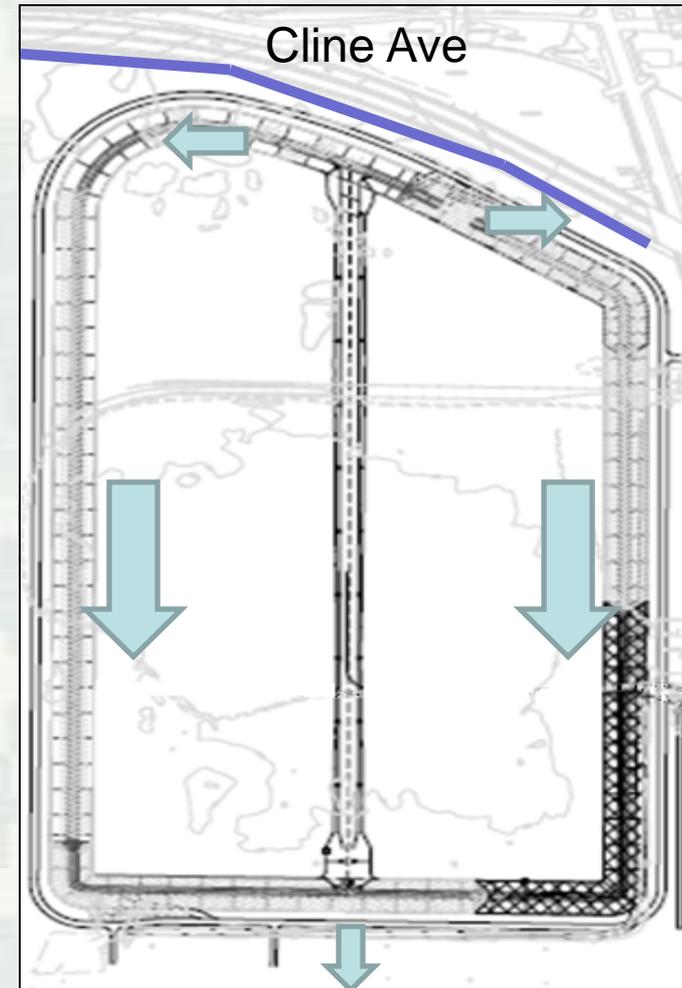
# Dam Safety Communication

- Communication plans should an emergency occur
  - ▶ Emergency Action Plan – an internal notification plan to quickly transmit information from the site to USACE officials
  - ▶ Coordinated with local emergency responders (East Chicago EM, Police, & Fire Dept.)
  - ▶ Practiced internally so all on site personnel are familiar with emergency procedures



# Preventing/Controlling an Environmental Emergency

- Regular inspections of CDF condition
- Frequent monitoring and surveillance of instrumentation
- Staff training
- Controlled inflow of water
- 2 cells provide easier water management
- Ditches on surface drain water towards the canal
- Cline Ave support wall prevents flow to north
- Site topography would direct water to the south

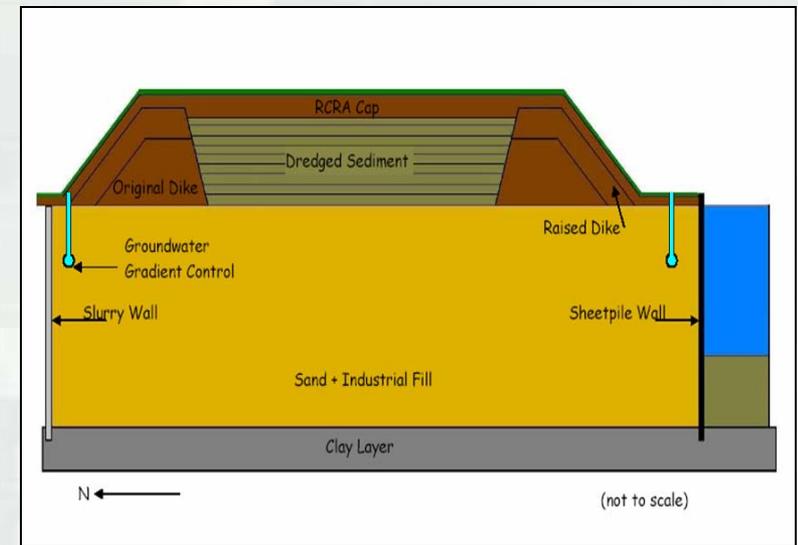


# CDF Groundwater Gradient Control

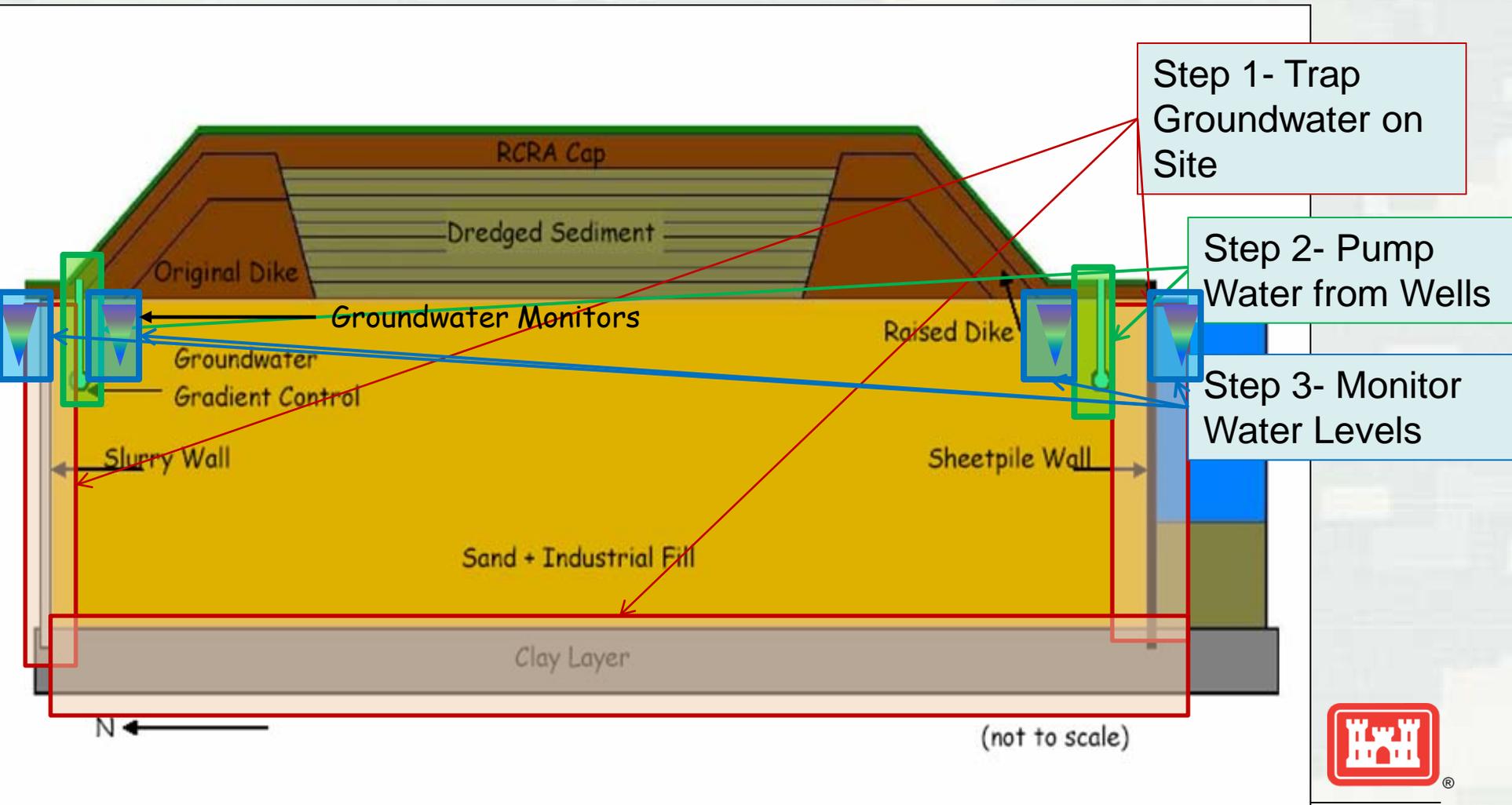


# Gradient Control System

- The Gradient Control System is a mechanical system to draw groundwater to the CDF
- System of wells, pumps, and piping all below ground surface
- Required to keep groundwater on site 2 feet below groundwater off site to contain existing contamination



# How the Gradient System Works

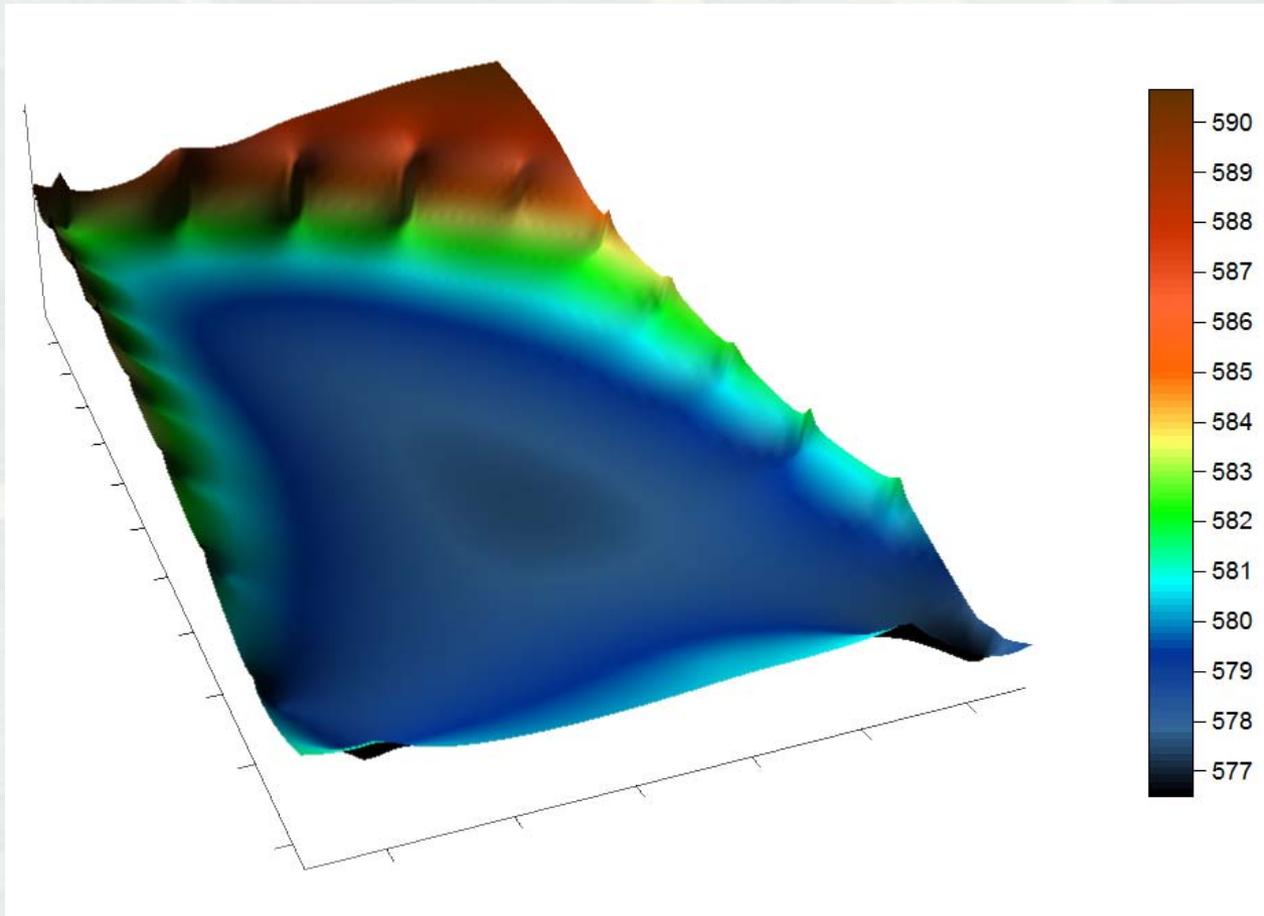


# Where does Groundwater Go?

- Wells direct water into pipes around the site
- The pipes lead to two large pump stations
- The pump stations pump water to a treatment facility on site
- The treatment facility treats the water and releases it in the canal



# What do the groundwater levels look like now



# Gradient Control Statics

- Working since June 2010 to lower groundwater
- 144 million gallons of groundwater pumped and treated from June 2010 – September 2011
- Average daily pump rate is 160 gpm



# Air Monitoring Update



# Ambient Air monitoring

- Was 2 locations (south side and high school)
- Going back to 5 locations:
  - All four sides of CDF, on top of dikes
  - High school (same location)
- Same monitoring parameters: volatile compounds, particulates, metals, semi-volatile compounds
- Data still to be posted on Argonne website:

<https://web.ead.anl.gov/inharbor/data/analysis/publicTables/index.cfm?p=1>

Or access through project website:

[http://www.lrc.usace.army.mil/projects/IN\\_harbor\\_canal\\_CDF/index.html](http://www.lrc.usace.army.mil/projects/IN_harbor_canal_CDF/index.html)



# Ambient Air Monitoring Station



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# New Air Monitoring Activities

- Real Time Air Monitoring
  - ▶ Purpose is to determine what is emitted from the CDF, and what controls are needed
  - ▶ Naphthalene (surrogate for all volatile compounds)
  - ▶ Particulates
  - ▶ Data will be posted on a website (in development)
  - ▶ Anticipated to start in the spring (will start prior to dredging)



# New Air Monitoring, Continued

- Dock face monitoring using a Photo-ionization detector (PID)
  - ▶ Intended to determine if there is any impact from barges parked along the south side of the site during sediment handling
  - ▶ Will measure total volatile compounds (from all sources in the area)
  - ▶ “Point” measurements (not continuous), measurements will be posted on website with real time measurements





# Photo- ionization detector (PID)



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# Questions? Comments?



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