HERBERT HOOVER DIKE REHABILITATION PROJECT

Project Status
March 2011

US Army Corps of Engineers
BUILDING STRONG®

Presentation Outline

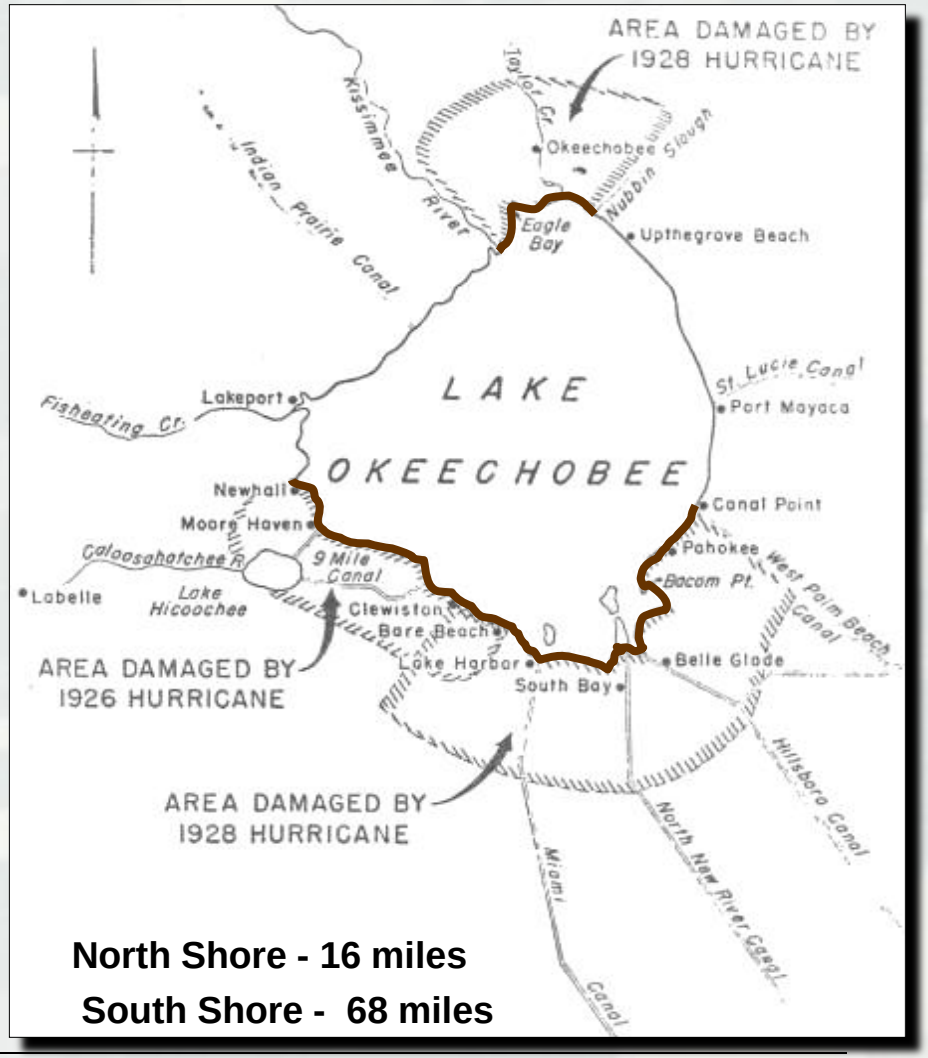
- Herbert Hoover Dike system
- Dike problems and solutions
- Construction progress
- System approach
- Scheduled work

Orientation

- Lake Okeechobee is 720 square-miles – twice the size of NYC
- Average water depth is 9 feet
- Water volume equal to 2.2 million Olympic-size pools
- Basin is 5,600 square-miles
- One foot of rain in the basin equates to a three to four-foot rise of the lake
- Water flows in six times faster than it can be released

Congress Authorizes Herbert Hoover Dike in 1930

Over 2,500 people killed by the 1928 hurricane



Central and Southern Florida Project

- 1947 - Hurricanes flood much of South Florida; dike prevents flooding from lake
- 1948 - Authorization of Central & Southern Florida Project; includes expansion and taller dike

Corps Completes HHD in 1960s

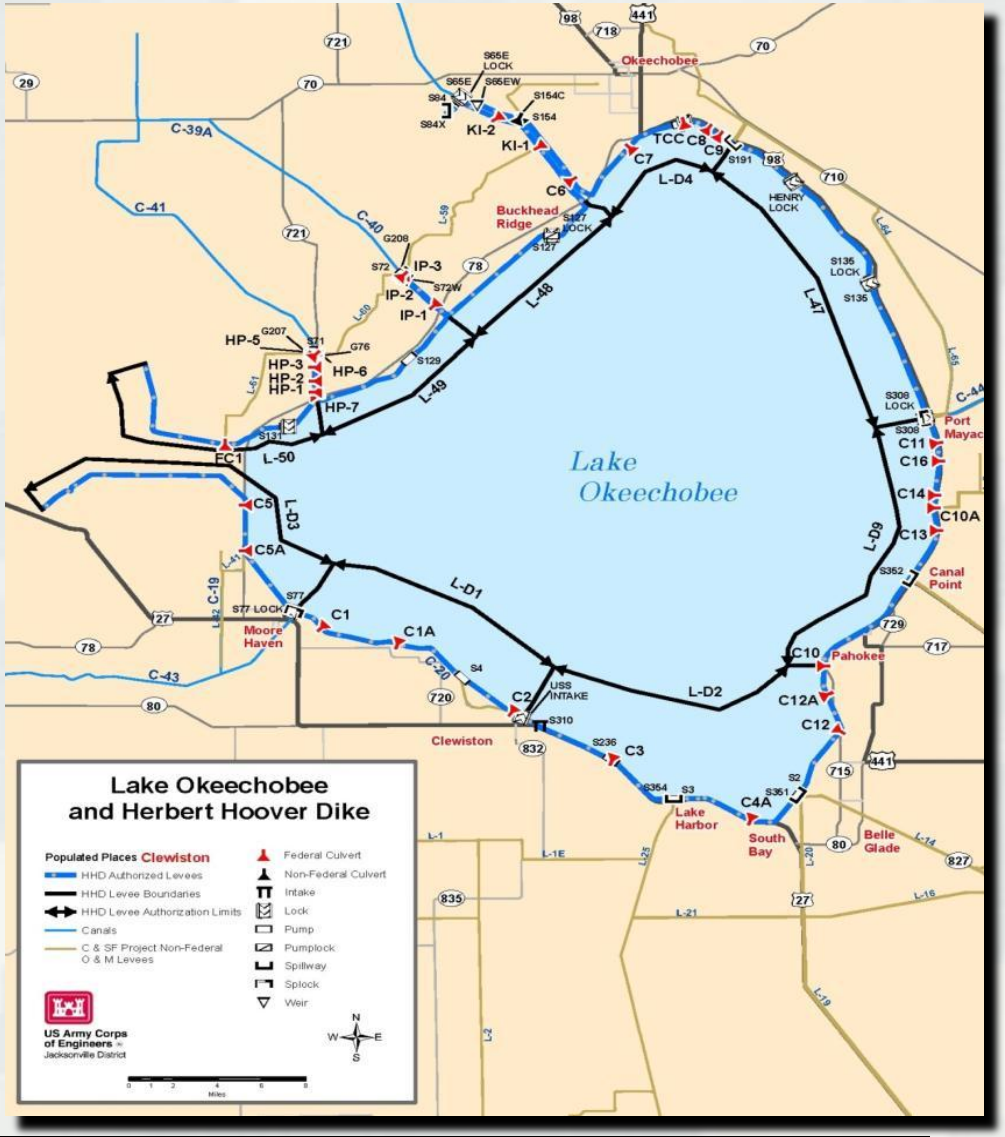
Complex System

143 miles of levee
5 spillway outlets
5 spillway inlets
32 federal culverts
9 navigation locks
9 pump stations

Built by hydraulic dredge and fill methods

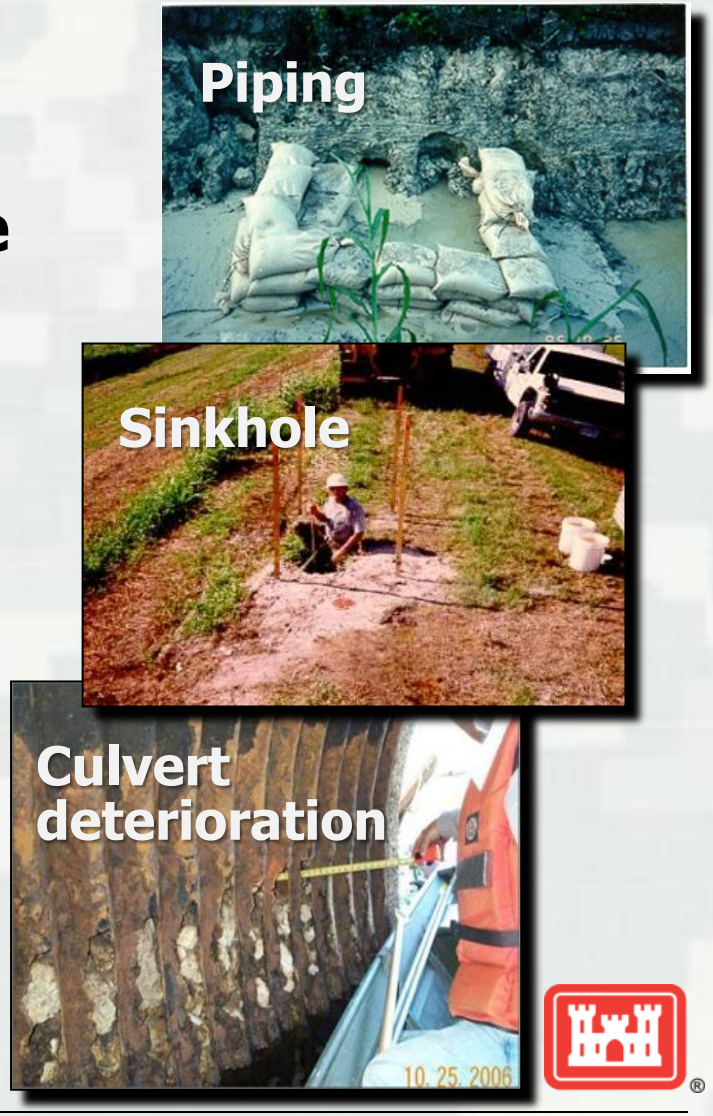
(not acceptable by today's construction standards)

No overflow capacity



Dike Problems Develop

- 1970-1980s: Lake Okeechobee raised for water supply
- 1995 & 1998: Near failures due to high water (18.5 feet)
- 2005: Storms / high water
- High lake levels cause uplift pressures on land side
  - Internal erosion (boils, piping)
  - Sinkholes develop
  - Eventual embankment failure
- Culvert Structures
  - Erosion into and around conduit



Hurricane Katrina Alters Risk Management

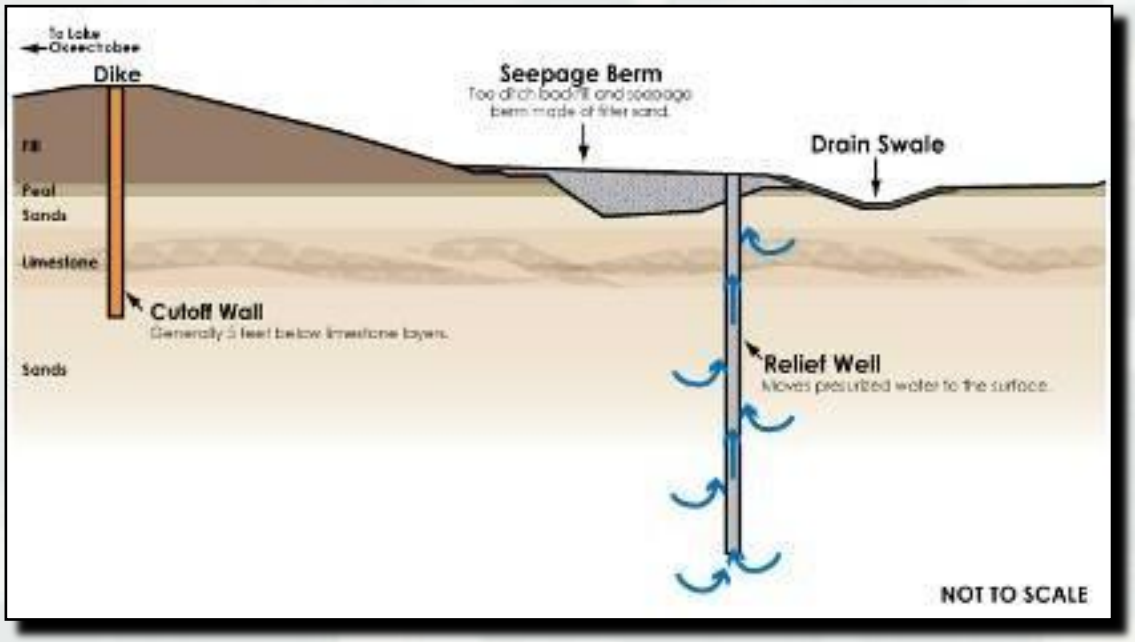
Hurricane Katrina strikes land
Aug 29, 2005

- **World-wide impact, re-evaluation of projects**
- **Corps changes procedures for managing dams and levees**
- **Interagency Performance Evaluation Task Force Report recommends *robustness, resiliency and redundancy* for all dams**
  - **Adopted by Corps**

Herbert Hoover Dike and Corps Dam Safety Program

- HHD is included in the Corps dam safety program (over 100 dams throughout the United States included in the program/portfolio)
- HHD is one of 16 dams included as Dam Safety Action Classification (DSAC) Level 1, the highest risk level and rating
- In FYs 2009, 2010, and 2011 HHD received over 20% of the overall dam safety program budget for the Corps
- HHD project team works closely with Corps dam safety and Risk Management Center on all aspects of planning, design, and construction

Current Rehab Strategy



Features

- Cutoff wall
- Seepage Berm
- Relief Wells
- Culvert removal or replacement

- Over 140 miles of dike
- Entire dike was divided into 8 reaches in priority order
- Most rehab efforts initially focused in Reach 1

Completed Construction

- Cutoff Wall Task Order #1 – 0.8 miles
- Cutoff Wall Task Order #2 – 3.2 miles
- Cutoff Wall Task Order #3 – 3.2 miles
- Quarry Backfill Project
- Partial Seepage Berm
- Focus Area Toe-Ditch Fill
- Vegetation Removal

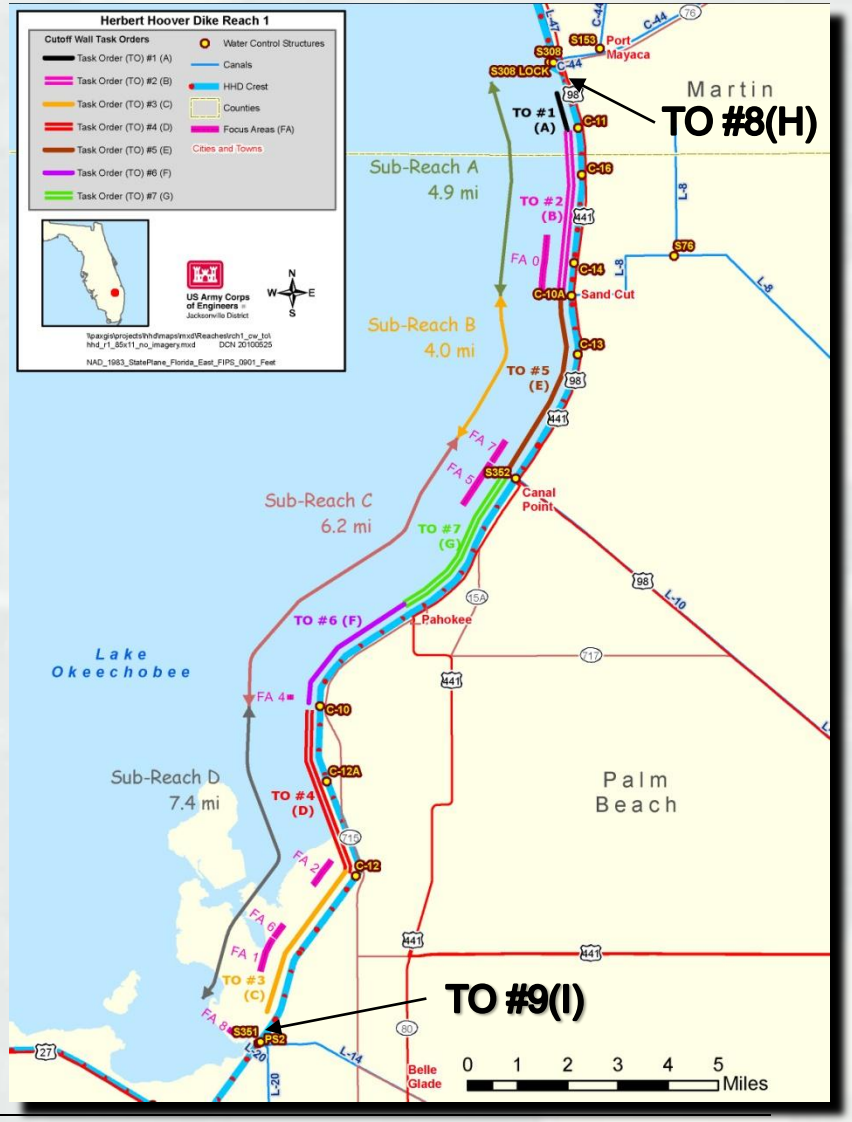
Construction Progress

Cutoff Wall Task Orders

- #4(D) – 3.3 miles, fall 2011
- #5(E) – 3.8 miles, fall 2013
- #6(F) – 2.7 miles, spring 2013
- #7(G) – 3.4 miles, spring 2013
- #8(H) – 0.8 miles, award FY2011
- #9(I) – 0.6 miles, award FY2011
  - Completes construction using current MATOC contract
  - Cutoff wall tie-ins to culverts pending

Culvert 14 Removal Project

- Complete by spring 2012



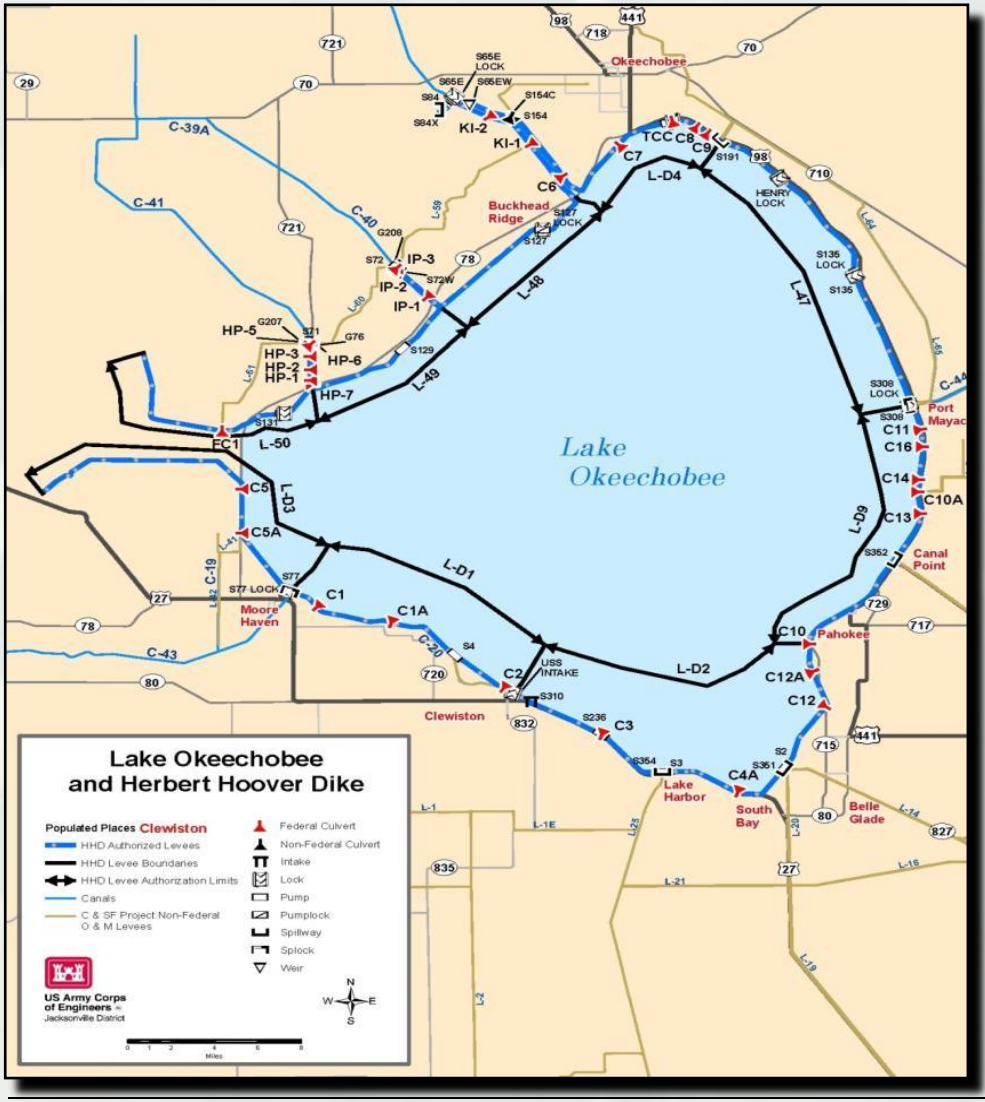
2010 Risk Assessment

- **Risk Assessment (RA) required for dam safety modifications**
  - **Reviewed by expert panel from Corps Risk Management Center**
- **Expert panel recommendations:**
  - **Incrementally reduce risks system-wide, not reach by reach**
  - **Replace culvert structures; they have high probability of failure**
  - **Seek a more economical solution with features that can be implemented incrementally reducing the overall risk to the system**

System-Wide Approach

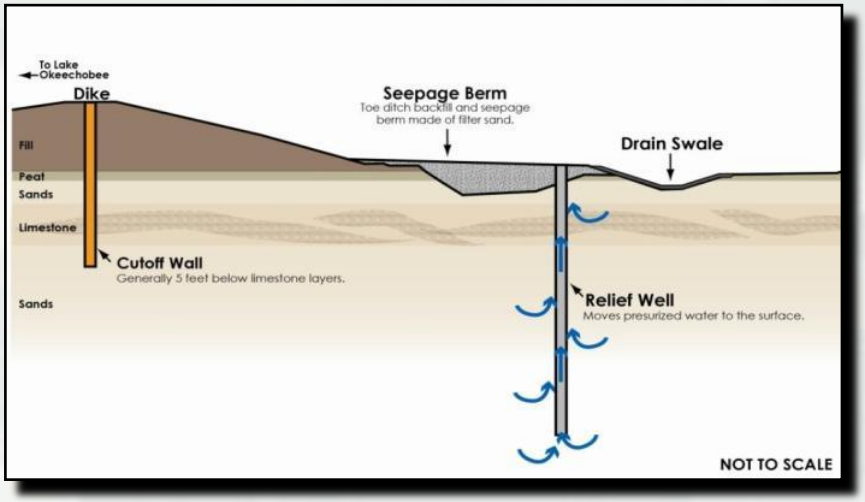
- **Address highest risks first**
  - Prioritize culvert removals and replacements
- **Investigate alternative plan**
  - Pilot test to demonstrate
  - Calibrate computer models
  - Constructability
  - Implementation costs
- **Prepare System Analysis Report**
  - Dam Safety Modification Report (required for dam modifications)
  - Define baseline risk condition for entire system
  - Prioritize reducing risks system-wide
  - Implement features incrementally
  - *Currently developing the scope of this document*

Prioritize Culvert Replacements



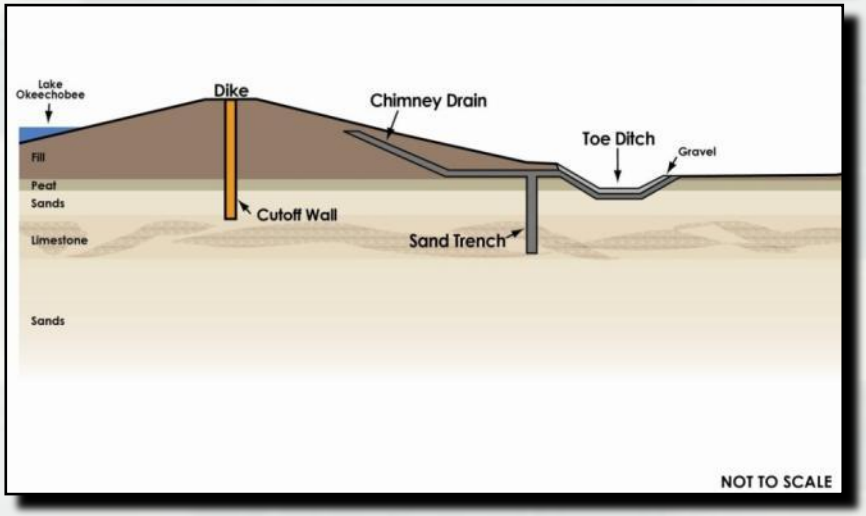
- **Replacements**
  - **28 federal culverts operated and maintained within the HHD system**
- **Removals**
  - **Culvert 14**
  - **Culverts 7 & 9**
  - **Taylor Creek Culvert (TCC)**

Alternative Rehabilitation Plan



Current Plan (Reach 1)

- cutoff wall through rock layer
- landside berm
- landside relief wells
- new drainage swale
- *requires land acquisition*



Alternative Plan (Pilot Test)

- cutoff wall to top of rock layer
- sand trench
- chimney drain
- lining of toe ditch
- *no land required for pilot test*

Scheduled Work

- **FY 2011 ($104.8M)**
  - Cutoff wall task orders #8(H) and #9(I)
  - Culverts 11 and 16 (Culvert 3 optional)
  - Culverts 1 and 1A (Culvert 4A optional)

- **FY 2012 ($85M)**
  - Alternative Plan Pilot Test
  - Culverts 3 and 4A
  - Culverts 5 and 5A
  - Culvert 12
- **FY 2013 - 2016**
  - Dam Safety Modification Report
  - Replacement of remaining 19 culvert structures
  - Removal of Culverts 7, 9, and TCC


Questions
or
Comments?