



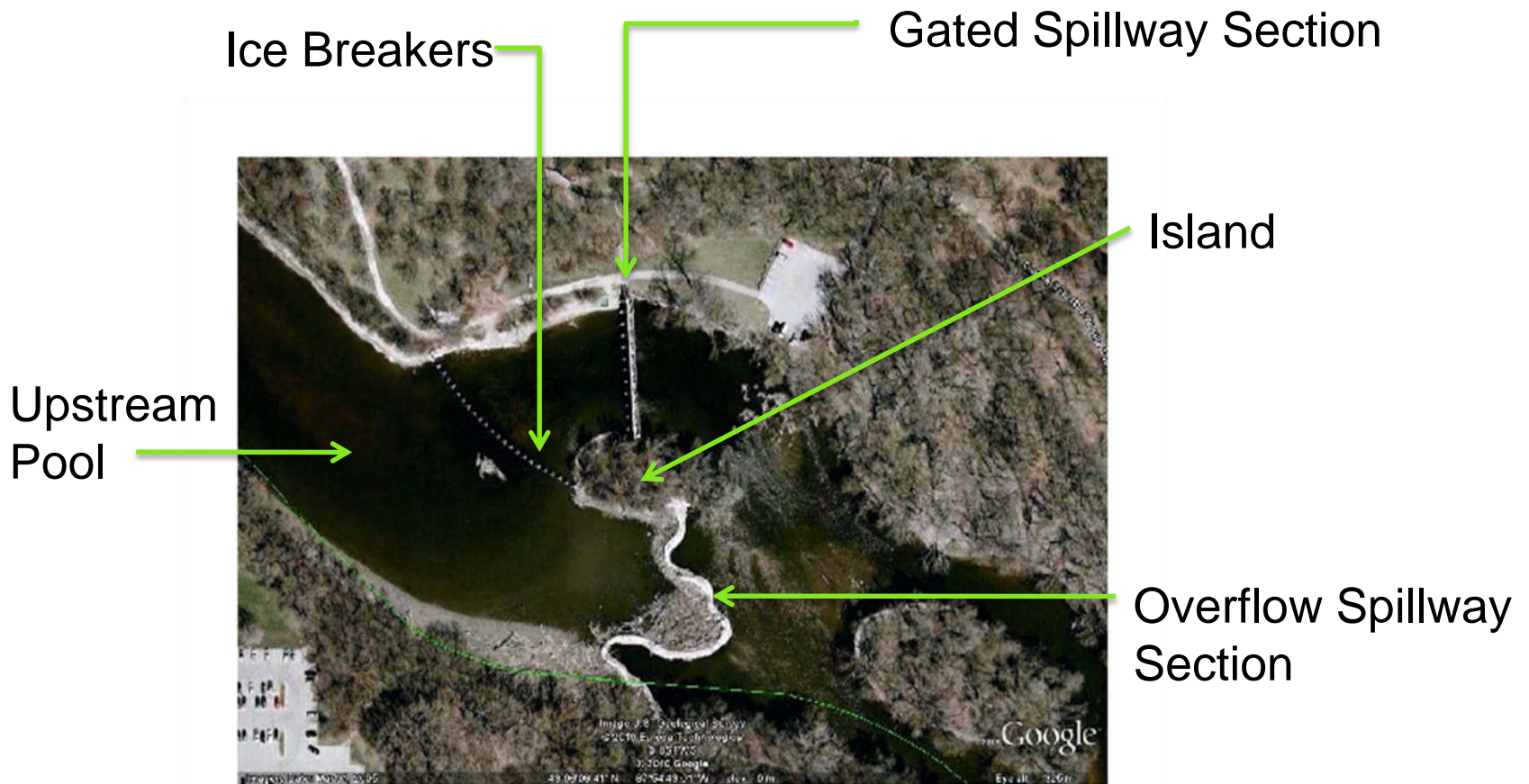
## Estabrook Dam – Project Update

Milwaukee County Parks, Energy, and Environment Committee Meeting –  
June 16, 2015

# Presenters

- Kevin Haley, PLA, Milwaukee County
- Don Pirrung, P.E., PH, AECOM

# Estabrook Dam Aerial View, with Features



# Discussion Topics

- Status of Environmental Impact Statement
- Dam Repair Design
- Fish Passage Design
- Estimated Capital Costs
- Funding
- Estimated Annual Operation and Maintenance Costs
- Dam Operation Plan
- Project Schedule

# Status of Environmental Impact Statement

- Formerly Referred to Environmental Assessment
- Submit Updated Version to County on June 19, 2015
- Submit EIS to WDNR by July 10, 2015
- WDNR Holds Public Information Hearing on Dam EIS and Operation Plan in September 2015

# Dam Repair Design

- Structural Improvements
- Upgrading Gates
- June 4, 2015 Dam Structural Inspection
  - ▶ 20% Additional deterioration since 2010 inspection



# Dam Structure Inspection





# Dam Structure Inspection

## 78-Year Old Dam





Repair stairs at both ends of gated spillway

Photo 7/8/10

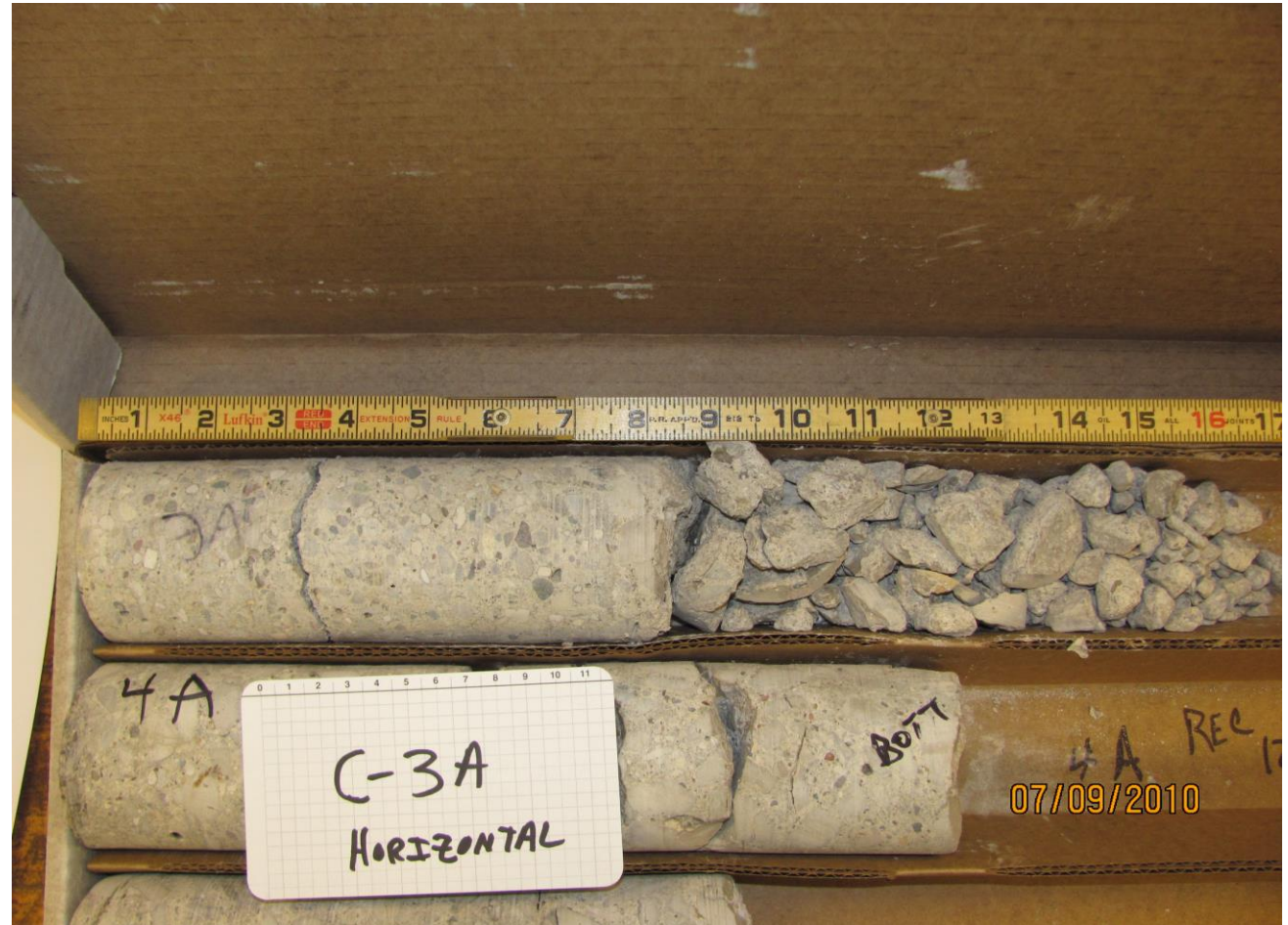


Repair deterioration below water line at gate piers

Photo 8/8/10

# Concrete Core

Concrete Core of Pier



# Dam Structure Inspection

Photo 1: Wall of the south abutment stairs with severe cracking



# Dam Structure Inspection

Photo 2: Close-up view of wide cracking (arrow) in the wall shown in Photo 1.



# Dam Structure Inspection

Photo 3: Upstream side of Pier 1 (left), Pier 2 (center), and Pier 3 (right) in 2010



# Dam Structure Inspection

Photo 4: View of the upstream face of Pier 2 in 2015 with spalling of the concrete at the tip of the pier. Refer to Photo 3 for comparison to 2010 observed condition.



# Dam Structure Inspection

- Fixed crest spillway, spalling concrete and shotcrete.





# Fish Passage Design

- Allows fish to travel and migration
- Improves fishing and recreation
- Ozaukee County invested \$8 Million in fish passage
- Improves fish and aquatic life diversity
- County Board's 2015 budget does not include fish passage
- County is seeking grant funding
- Working with WDNR on fish passage layout
- Fish passage layout is expanding to allow for dam operation flexibility

# Estimated Capital Costs

Item	2010	2015
Dam Repair	\$1,660,000	\$2,287,000*
Fish Passage	\$857,000	\$1,325,000**
Total	\$2,517,000	\$3,612,000

\*20% additional structural deterioration since 2010 increases repair costs.

\*\*Expanded fish passage to allow for dam operation flexibility.

# Funding

Agency	Program	Funding Request	Grant Status
WDNR	Municipal Dam Grant	\$400,000	Set Aside*
WDNR	Stewardship Fund	\$980,717	Set Aside*
US Fish & Wildlife Foundation	Sustain Our Great Lakes (SOGL)	\$857,000	Pending
US Fish & Wildlife Service	Fish Passage	\$230,000	Pending
NOAA	Environmental Restoration	\$897,000	Pending

\*WDNR has set aside these funds pending WDNR approval of the project permits, design, and operation plan.

# Summary of Capital Costs and Potential Funding

A. Estimated Capital Cost Dam Repair	\$2,287,000
County Capital Budget Allocation for Repair	\$1,600,000
Funds Set Aside by WDNR	\$1,380,717
Balance (Surplus Funds)	\$693,717

Therefore, capital costs for dam repair are covered.

B. Estimated Capital Cost Fish Passage	\$1,325,000
Balance (Surplus Funds)	\$693,717
Other Pending Funding*	\$1,087,000

\*If pending funding reaches about \$632,000, the fish passage capital cost is covered.

# Estimated Annual Operation and Maintenance Costs



County will need to budget about \$110,000 annually for O&M costs starting in 2017\* for a maintenance trust fund.

\*Note: By 2017, maintenance trust fund is projected to have about \$250,000 available, so 2017 costs are covered.

# Dam Operations Plan

- Subject to WDNR approval
- Maintain full pool mid-May through Mid-September for recreation.
- County will monitor river levels, weather, debris buildup daily. If 10-year flood or greater, open all 10 gates to avoid flooding properties upstream.
- During major flood event, County staff will be at dam to operate gates.
- In September, open gates to lower river level, then remove stoplogs to lower the pool by 3 feet.
  - Intended to reduce ice damage to gates and protect aquatic life like mussels upstream.
- Maintain impoundment level until mid-May.

# Implementation Schedule

1. Submit final EIS and Operation Plan to WDNR for Approval July 10, 2015
2. Submit Final Dam and Fish Passage Design and Permit Application to WDNR August 31, 2015
3. WDNR Holds Public Information Hearing on Dam EIS and Operation Plan September 2015
4. WDNR Approves Dam and Fish Passage Design, Operation Plan, and Permits December 1, 2015
5. County Bids Dam Repair and Fish Passage Project December 15, 2015
6. Contractor Begins Dam and Fish Passage Construction June 1, 2016
7. Contractor Completes Dam and Fish Passage Construction October 31, 2016
8. Dam and Fish Passage are Complete October 31, 2016
9. Approved Operation Plan for Dam is Put in Effect May 1, 2017