



Mill Pond Dam Feasibility Study

Oyster River Dam at Mill Pond

Public Information Meeting
January 16, 2020



Meeting Agenda

- Introduce Team Members
- Review the Project Scope of Work
- Review Preliminary Information from December 2019 Dam Inspection
- Discuss Project Schedule
- Questions and Discussion

Project Team



Peter J. Walker
Project Manager



Allen Orsi, PE
Geotechnical/Dam Engineering



Bill Arcieri, CPSWQ
Water Quality Scientist



Andrew Walker, PH, CFM, EIT
Hydrology & Hydraulics

Project Team



Rene Nahlik, PE
Soil and Groundwater



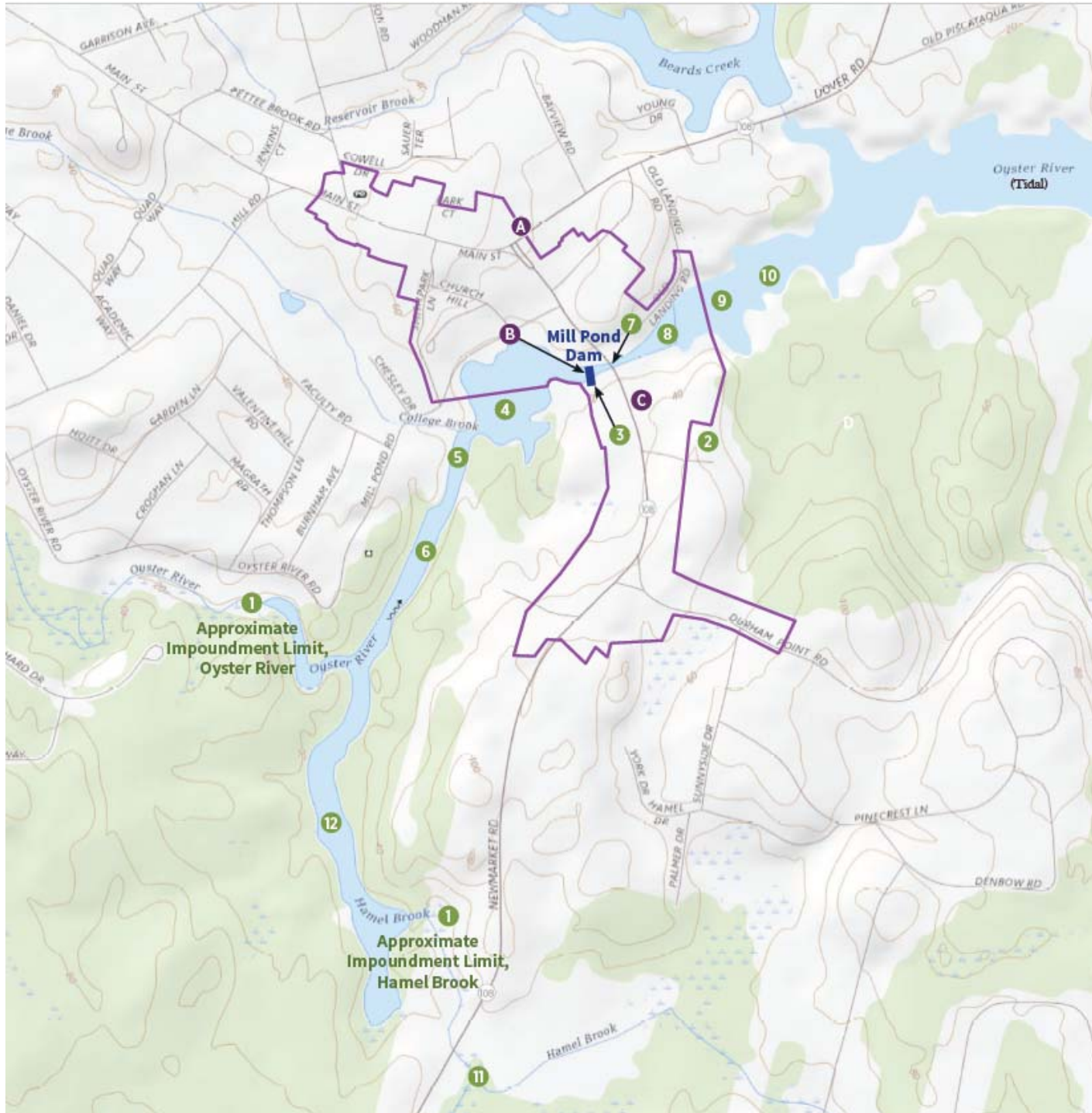
Wil Wolheim, PhD
Water Quality Scientist



Quinn Stuart
Cultural Resource Specialist



Kathy Wheeler, RPA
Archaeological Resources



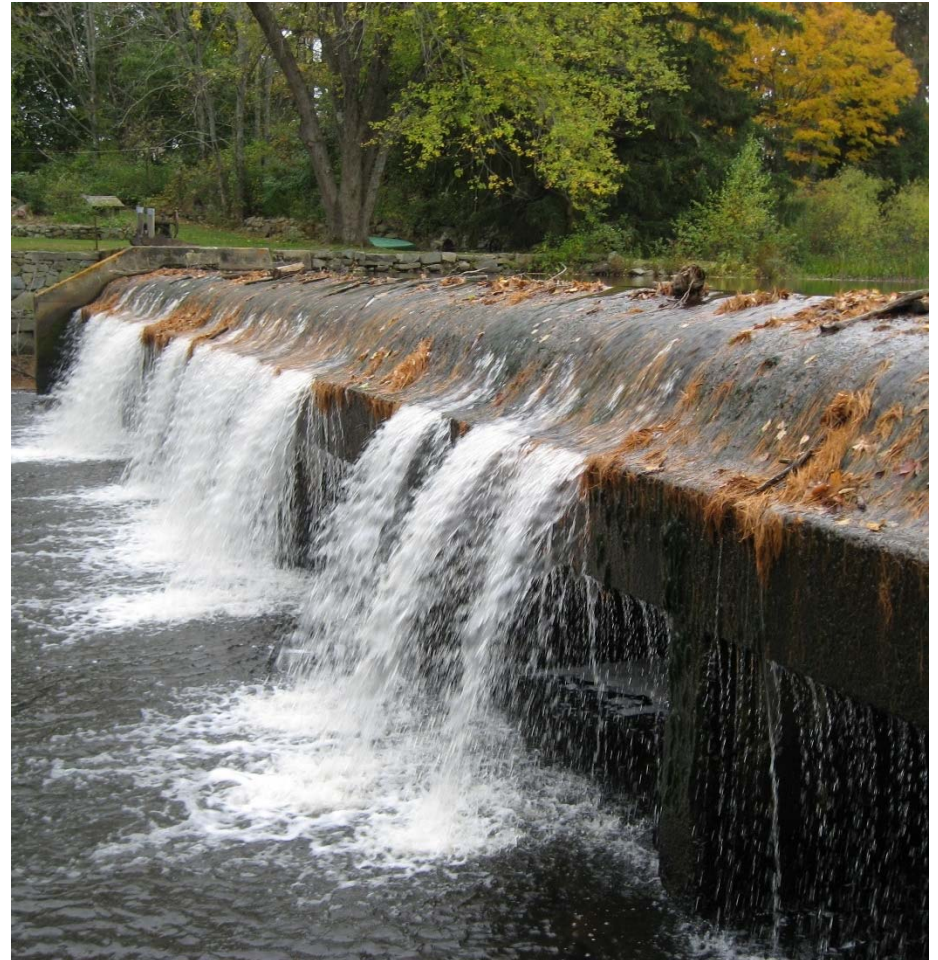


Mill Pond Dam Timeline

- 1913 • Mill Pond Dam Constructed
- 1974 • Dam Rehabilitation and Fish Ladder Construction
- 1984 • Mill Pond Dredged to Control Vegetation
- 1999 • NHDES Dam Bureau Issues First Letter of Deficiency
- 2002 • NHDES Dam Bureau Issues Revised Letter of Deficiency
- 2008 • *Relative Cost Comparison of Rehabilitation vs. Decommissioning* (Stephens Assoc.)
- 2009 • *Mill Pond Bathymetric and Sediment Study* (VHB)
- 2010 • Mill Pond Dam Determined Eligible for the NRHP
- 2011 • *Concrete Studies of the Oyster River Durham Falls Dam* (Stephens Assoc. & Dr. Gress)
- 2014 • *Durham Ponds Assessment and Plan* (DK Water Resource Consulting)
- 2018 • NHDES Dam Bureau Issues New LOD
- 2018 • *Mill Pond Study* (Weston & Sampson)
- 2019 • Mill Pond Feasibility Study Initiated (VHB Team)

Dam Safety

- Current Classification “Low Hazard Structure”
 - Does not meet discharge capacity requirements
 - Known structural deficiencies
- NHDES Letter of Deficiency
 - Original Letter 1999
 - Revised Letter 2002
 - New Letter 2018



The background is a solid blue color with a complex, abstract pattern of white lines. The pattern consists of various geometric shapes, including squares, rectangles, and curved lines, arranged in a way that creates a sense of depth and movement. The lines are thin and light, blending into the blue background.

Study Scope

Data Collection & Review

Collect and review available data and resource information on file with various agencies.

The following activities will be completed:

- Dam Inspection
- Geotechnical Investigation



Field Survey & Base Mapping

- Field Survey, Property Research, Monument Location
- River and Impoundment Survey
 - Dam Structure Survey
 - River Impoundment Survey



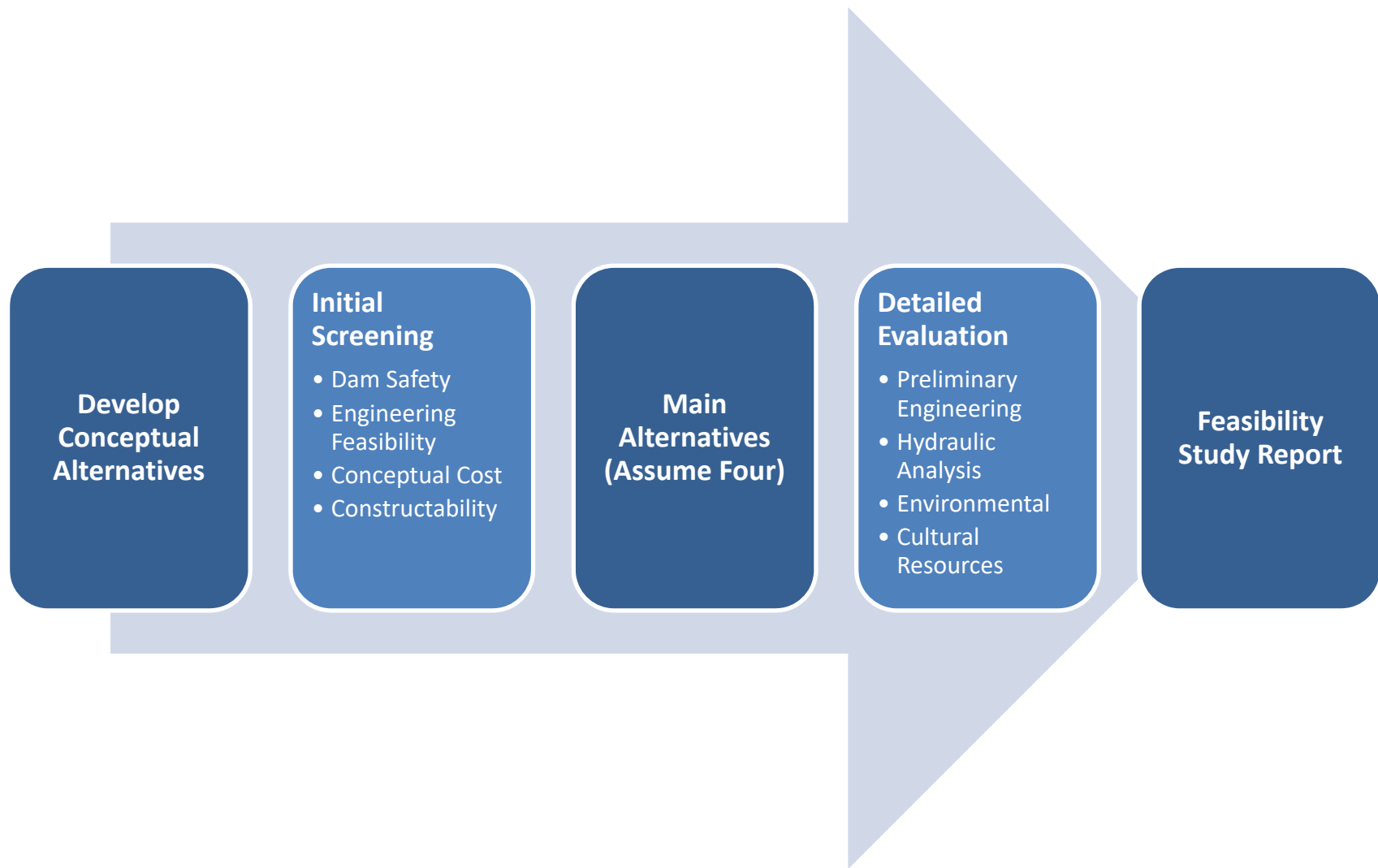
Alternatives Analysis

General Alternatives Categories

- No-Action
- Dam Removal with River Restoration
- NHDES Reclassification
- Repair/Stabilization of the Existing Dam
- Reconstruction/Rehabilitation of Dam

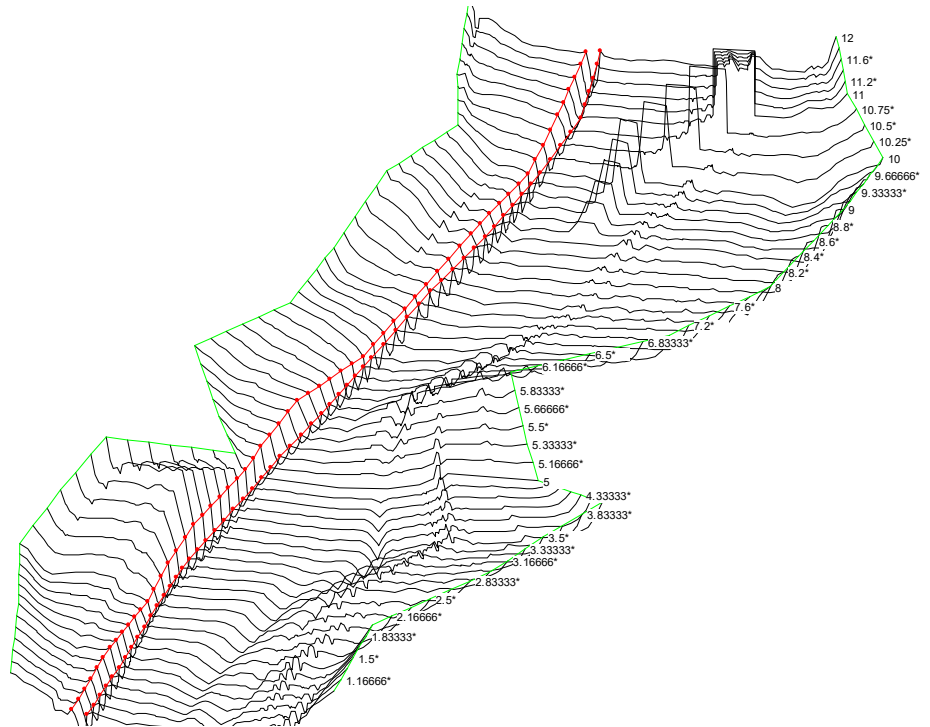
Conceptual alternatives will be narrowed to a short list for detailed study.

Study Process



Hydrological & Hydraulic Model (HEC-RAS)

- What will the model tell us?
 - How will river and pond **Depths** change adjacent to river (horizontal and vertical)?
 - How would **Wetlands** and **Wildlife** be affected?
 - Would **Groundwater** conditions be affected?
 - How would **Sediment Transport** (i.e., erosion and deposition) change?
 - Will bridges and foundations be more susceptible to **Scour**?



Sediment & Water Quality Evaluation

Sampling Plan

- Developed to ensure reliable data is collected

Sediment Sampling & Evaluation

- Chemical analysis of sediment from up to seven sites

Water Quality Evaluation

- Using existing data, identify the effects of the dam on water quality
- How would various alternatives benefit or impact water quality?

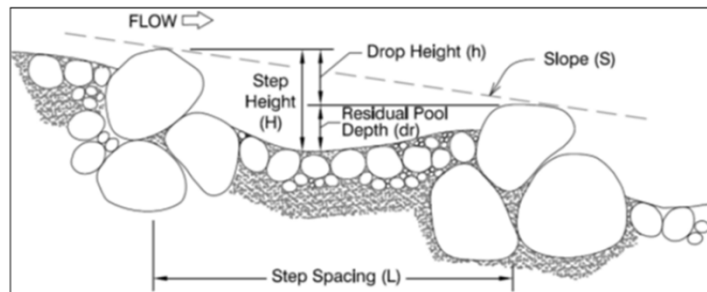
Wildlife & Natural Communities

- State and federally-listed threatened and endangered species
- Consultation with:
 - NHNHB
 - NHF&G
 - USFWS
 - NMFS



Fisheries

- Mill Pond Dam impacts diadromous fish migrations in the Oyster River
- Blueback herring monitoring numbers have been falling dramatically
- Impoundment impacts habitat and water quality



Cultural Resources

- Review of Existing Historical Documentation
- Phase IA Archaeological Sensitivity Assessment
- Request for Project Review and Coordination with NHDHR & Coordination with Army Corps of Engineers
- Identify mitigation measures

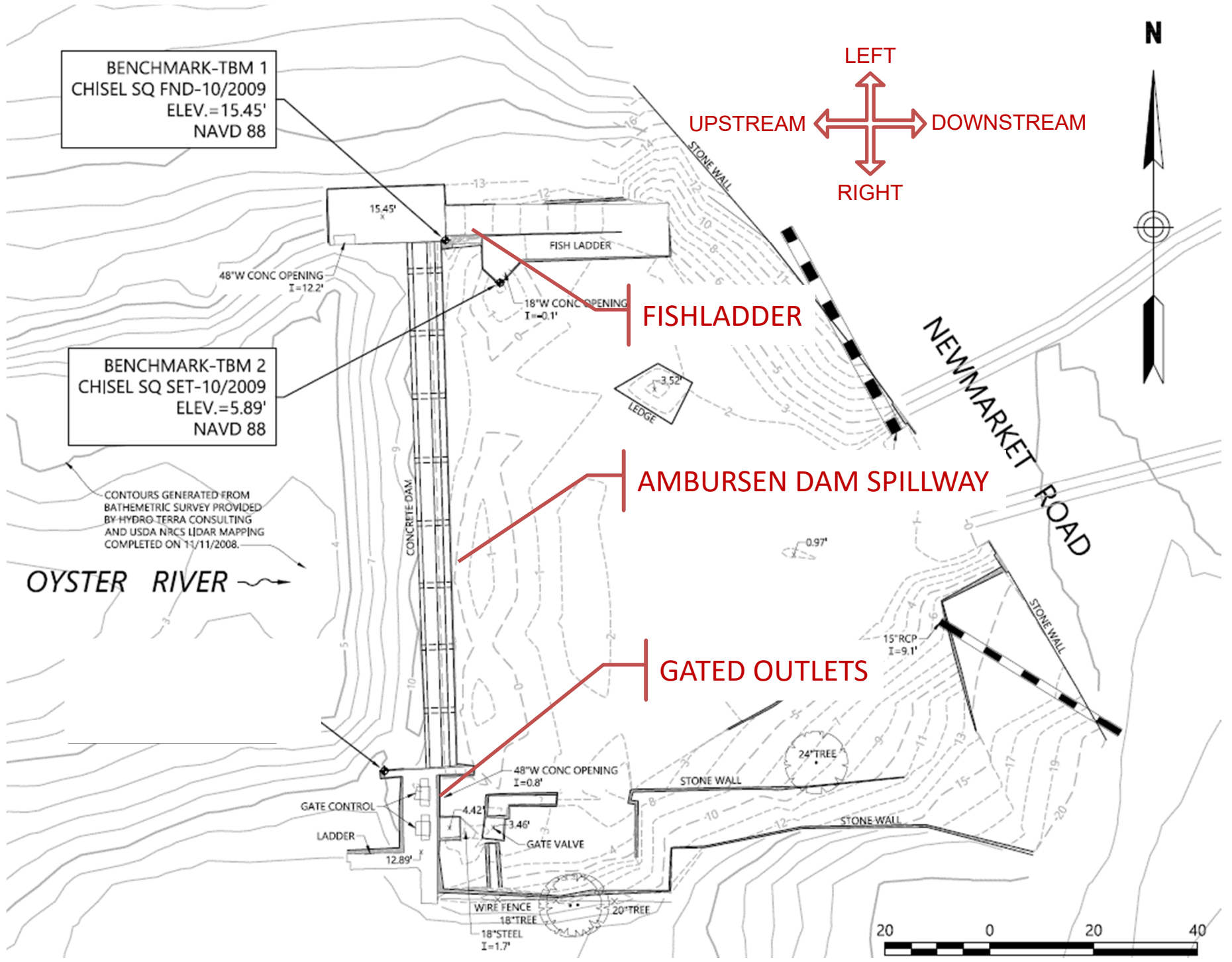


Visual Assessment

- A view upstream from the Mill Pond Park
- A view looking upstream from the NH 108 Bridge
- A view from a location to be determined



Dam Inspection



BENCHMARK-TBM 1
CHISEL SQ FND-10/2009
ELEV.=15.45'
NAVD 88

BENCHMARK-TBM 2
CHISEL SQ SET-10/2009
ELEV.=5.89'
NAVD 88

CONTOURS GENERATED FROM
BATHYMETRIC SURVEY PROVIDED
BY HYDRO TERRA CONSULTING
AND USDA NRCS LIDAR MAPPING
COMPLETED ON 11/11/2008.

OYSTER RIVER

LEFT
UPSTREAM
DOWNSTREAM
RIGHT



FISHLADDER

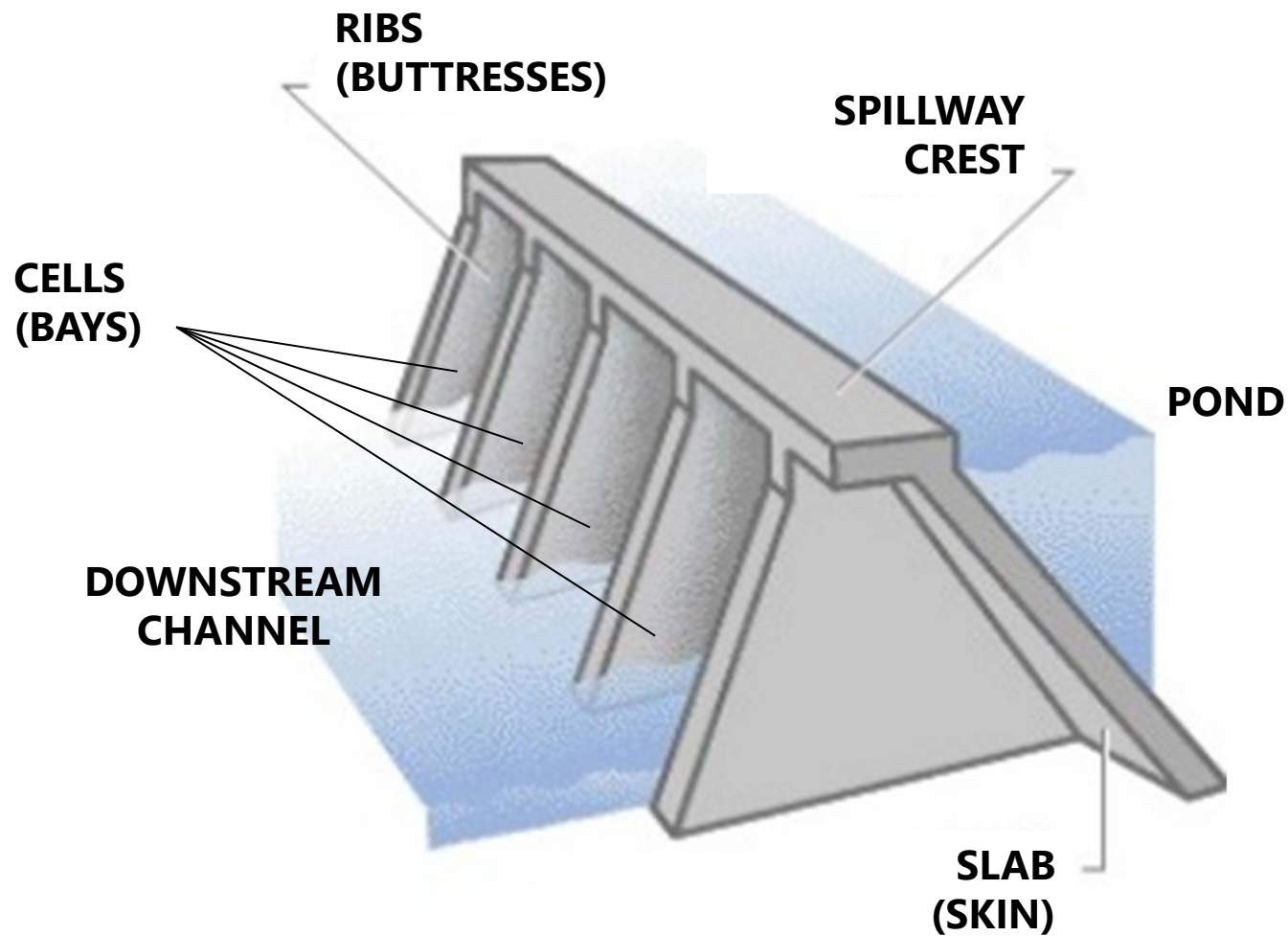
AMBURSEN DAM SPILLWAY

GATED OUTLETS

NEWMARKET ROAD



Anatomy of an Ambursen Dam



Dam Structural Inspection – December 2019

Inspection Summary

- December 18, 2019
- 4-inch Drawdown to facilitate inspection
- Visual & Tactile Inspection of Above Water Components of the Spillway, Gate Headwalls, and Dam Sections
- Included:
 - Spillway “Exterior”
 - Spillway “Interior”
 - Gates
 - Fish Ladder



Dam Structural Inspection – December 2019

- Spillway “Exterior”



- Spillway “Interior” (Ribs & Cells)



Dam Structural Inspection – December 2019

- Gated Outlets



- Fish Ladder



Dam Structural Inspection – December 2019

- Examples of Deterioration Progression



Dam Structural Inspection – December 2019

- Examples of Deterioration Progression



Dam Structural Inspection – December 2019

- Examples of Deterioration Progression



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Dam Structural Inspection – December 2019

Inspection Implications

- Gress Study Concurrence
 - Concrete Deterioration
 - Advanced Deterioration
- Degradation of Concrete Has Continued
- Short Term Stability Concerns
- Next Steps
 - Evaluate Impacts to Alternatives
 - Assess Replacement Requirements
 - Consider life expectancy for Alternatives

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Study Schedule & Process

Project Schedule

Task	Timeline
Field Surveys	Fall-Winter 2019-2020
Develop Conceptual Alternatives	Winter 2020
Preliminary Analysis of Alternatives	Winter-Spring 2020
Public Information Meeting	Early Summer 2020
Draft Feasibility Report Issued	Late Summer 2020
Public Information Meeting	Fall 2020
Final Feasibility Report Issued	Fall 2020



Thank you! Questions?



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