

# Eagle Dam Removal Technical Feasibility Study Wrentham, MA

## Summary of Findings

Prepared for: Town of Wrentham



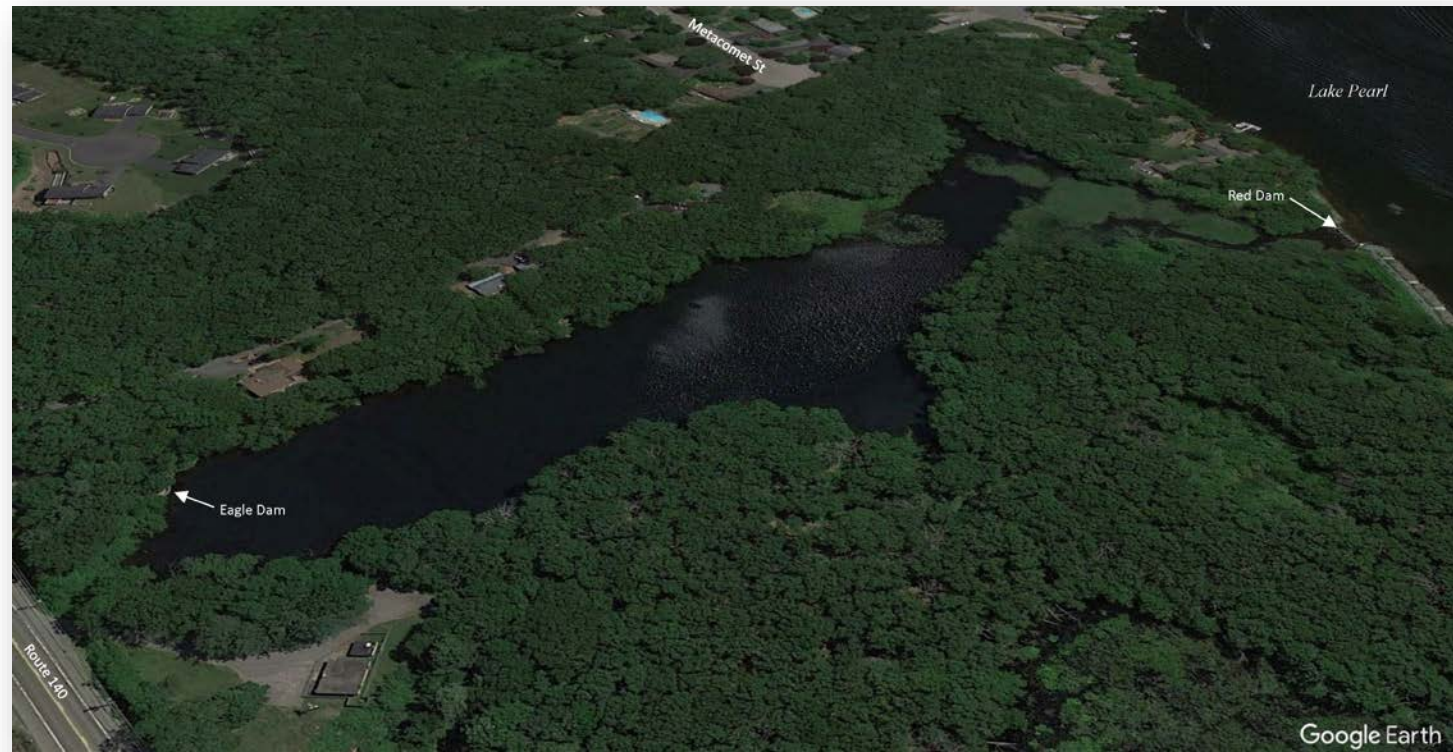
Craig Wood | ESS Group, Inc.

Presentation to Wrentham Board of Selectmen May 4, 2021



# Project Background

- Top potential vulnerability priority; current degraded condition, maintenance needs, and future climatic conditions (2018 Wrentham Municipal Vulnerability Preparedness (MVP) Resilience Building Workshop)
- Currently rated as a low hazard dam in poor condition (2012 Inspection)
- Status quo not an option (public safety/potential enforcement)
- Typical options: repair, breach/remove, or lower dam structure to become non-jurisdictional
- Our task: investigate whether dam removal is feasible



# Project Background – Phase 1



Charles River Watershed Association

In 2019, Town of Wrentham awarded \$46,000 to conduct initial feasibility assessment to remove the dam from the state's MVP Action Grant Program

Project Team: Town of Wrentham DPW, Charles River Watershed Association, & ESS Group (engineering and technical analysis)

Timeframe: July 2019-June 2021 (extended due to COVID)



CRWA Team sampling at the site summer 2019 (pre-COVID)

# Dam Removal Feasibility Report Components

- Field Data Collection (site inspection, bathymetric survey)
- Sediment Collection and Assessment
- Cultural Resources
- Hydrology and Hydraulics Modelling
- Conceptual Renderings
- Dam Removal Concept and Cost Estimate
- Suggested Next Steps



# Key Study Findings

- Eagle Dam is higher than currently reported (12 verses 8 ft) – likely to be formally documented in 2022 inspection
- Mill pond average depth of roughly 4 ft with max depth of 5.5 ft near spillway. Normal pool volume 22 acre-feet
- Greater impoundment volume and potential flooding at Route 140 suggest higher hazard classification
- Non-jurisdictional dam: lower dam crest by 8 ft and lower normal pool elevation by 2 ft (<6 ft & < 15 ac/ft)
- While no migratory fish species present (excluding American eel), dam presents a barrier for native fish that would otherwise move along the stream system



# Key Study Findings Con't

- All sediment sampling below regulatory thresholds – does not pose human or ecological risk if mobilized downstream
- Somewhat elevated levels of certain metals are typical of New England background conditions
- Wrentham Historical Commission: demolition will not affect known archaeological sites / entire Town-owned land considered area of archeological sensitivity



# Key Study Findings - Hydrologic & Hydraulic Modelling

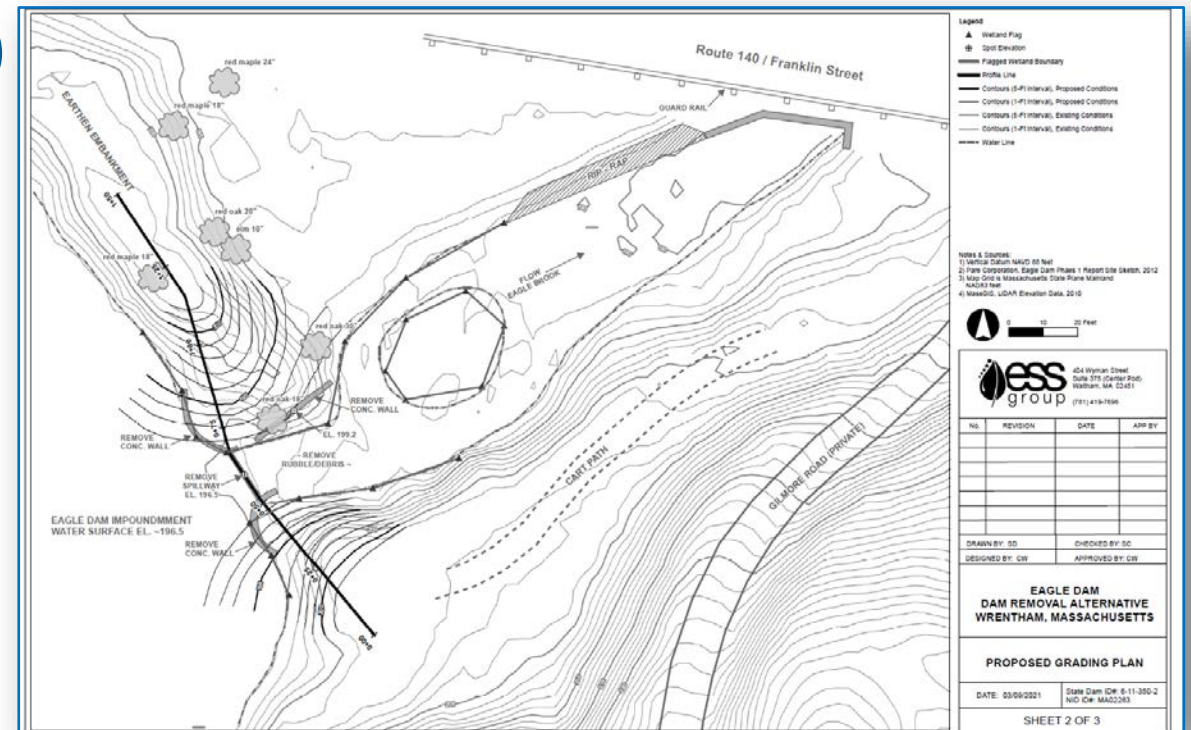
- Completed for 25, 50 and 100-year storm events using both 1992 rainfall data from Red Dam restoration study and current rainfall data (Northeast Regional Climate Center)
- While meeting MassDOT Principal Arterial design criteria, dam removal with historic rainfall raised 50 and 100-year storm water surface elevations at the Route 140 crossing
- Using current rainfall data, both existing conditions and dam removal overtopped Route 140 during 100-year storm event
- More robust analysis (coordinated with MassDOT) is warranted to confirm initial results and determine if increased hydraulic capacity may be required at Route 140



Upstream view of Rt 140 crossing (twin 8 x 4 ft box culverts)

# Dam Removal Concept

- Dam removal design needs to pass 100-year storm flow (198 cfs) without impoundment
- Create 16-ft wide breach and lower of the earthen embankment along both sides of spillway. Potential for access improvements to Lake Pearl
- Opinion of Probable Cost (w/ 25% contingency) \$680,000. Dam repair cost from 2012 report: \$581,000 to \$942,000
- Impoundment footprint restored to conditions prior to dam / loss of open water feature
- Dam removal would address public safety hazard (eliminating the risk of dam failure) and avoid future dam safety inspection and maintenance costs





# Conclusions and Next Steps

- Common barriers to dam removal projects (e.g., sediment quality and historical status) not found
- Potential candidate for dam removal with further study
- More detailed H&H modeling to assess possible flooding at Route 140
- Expand stakeholder and community outreach including MassDOT and the Town of Norfolk
- Potential for lower induced infiltration from mill pond to nearby public water supply wells needs further investigation



Eroded embankment west of spillway

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