



Frequently Asked Questions (FAQ)

Mill Pond Dam

Durham Public Works

January 26, 2022

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Overview and Process:

1. What purpose does the Mill Pond Dam serve today?

Answer: The Mill Pond Dam creates the Mill Pond and backwater which is used for recreational purposes, provides scenic vistas and creates habitat for warm water species. The dam does not impound water for the drinking water supply, nor does it generate electricity. A separate dam, the Reservoir dam at the UNH Water Treatment Plant, impounds water for water supply and is located further upriver.

2. Why is the removal of the Mill Pond Dam a priority project to Federal and State scientific and regulatory agencies such as the New Hampshire Department of Environmental Services (NHDES) and the National Oceanic and Atmospheric Administration (NOAA)?

Answer: The Mill Pond Dam is listed as a priority dam for removal in the 2020-2024 New Hampshire Nonpoint Source Management Program Plan because, according to NHDES, it no longer provides a valuable function, and it contributes to water quality or habitat impairments. Additionally, NHDES categorizes dams as a priority for removal when the waterbody on which it is located is on the New Hampshire's 303d list as impaired for chlorophyll-a, dissolved oxygen, or cyanobacteria hepatotoxic microcystins. The Mill Pond is impaired for dissolved oxygen and pH.

Dams on the list for priority removal may apply for grant funding to assist with the costs of eligible projects.

Reference: 2020-2024 New Hampshire Nonpoint Source Management Program Plan, pages 28-29, here <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/r-wd-19-22.pdf>.

3. How long has the Town and Town Council been working on this? What has been the process, including points of public feedback.

Answer: Residents of the Town of Durham and the Town Council have been discussing the fate of the Mill Pond Dam since the early 2000's when the very first Letter of Deficiency was issued by the New Hampshire Department of Environmental Services (NHDES) Dam Bureau. At the 1984 Town Meeting, residents directed the selectboard to establish a committee to develop a maintenance plan for the Mill Pond. That committee's report was published in the 1984 Town Report and recommended periodic dredging to improve the condition of the pond.

There have been many dam inspections, reports, and community discussions since that time. In 2018, the town was issued a new Letter of Deficiency from the Dam Bureau. Dam inspections were completed on December 8, 2017, December 18, 2019 and most recently on October 13, 2021, all showing continuing structural deterioration. To help determine what the town's next actions should be, the VHB Engineering Feasibility Study contract was approved by the Town Council in the Fall of 2019. A process was developed to include opportunities for the public to ask questions and provide input during the public comment portion of the meetings. Many residents, non-residents and environmental groups have written to the Town Council as well. These correspondences are available for review on the project

website located within the Public Works Engineering webpage at <https://www.ci.durham.nh.us/publicworks/oyster-river-dam-mill-pond-current-information-and-feasibility-study>. The project team presented an outline of the study to the Historic District Commission on December 5, 2019 and to the Conservation Commission on February 24, 2020. The first public informational meeting was held on January 16, 2020. A progress report, outlining various alternatives, was presented to the Town Council on June 15, 2020. The presentation of the final feasibility study was made to the Town Council on November 16, 2020. The public hearing on alternative actions for the Mill Pond Dam was held on January 11, 2021. The Town Council then requested additional information and continued to discuss the feasibility study through 2021, including at meetings held on February 15, 2021, April 5, 2021, July 12, 2021, August 16, 2021, and September 13, 2021 (where the Town Council voted 7-2 in favor of dam removal and approved a dam removal design contract with VHB).

At the October 18, 2021 Town Council meeting, Administrator Todd Selig announced that the Mill Pond Dam citizens petition had been received and certified by the Town Clerk and that options for placing the referendum question on the regular March 8, 2022 Town Election ballot had been discussed but would be settled at the November 1, 2021 meeting.

At the November 1, 2021 Town Council meeting, the Town Council rescinded the September 13th approval of the Final Design Contract for dam removal with VHB. At the same meeting the Council moved by a vote of 9-0, to approve the Final Design Contract for dam removal with VHB if the March 8, 2022 petition question to reverse the Council's decision to remove the dam failed.

Lastly, at the November 1, 2021 meeting, the Town Council moved, in accordance with Section 8.4 of the Charter of the Town of Durham, to submit to the voters at the March 8, 2022 Town Election a Proposition to Repeal the removal of the Mill Pond Dam stated as the question: "Shall the town vote to reverse the action of the Town Council taken on November 1, 2021 to remove the Mill Pond Dam."

Reference: All available information for the Mill Pond Dam on the Oyster River can be found on the Project Website located under the Engineering Division of Public Works found here <https://www.ci.durham.nh.us/publicworks/oyster-river-dam-mill-pond-current-information-and-feasibility-study> Meeting agendas, packets, and minutes of all Town meetings are cataloged by date here <https://www.ci.durham.nh.us/meetings>.

4. Why was VHB Engineers hired?

Answer: The VHB team, which includes a number of experts from Pare Corporation, Weston and Sampson, Independent Archaeological Consulting, UNH Water Systems Analysis Group, and DK Water Resources Consulting, was selected through a competitive qualifications-based process for their knowledge and expertise in the areas of dam management. VHB and the project team have specific expertise in the areas of environmental science, limnology, and dam structural engineering. They also have prior experience navigating the public process for similar projects in neighboring towns. VHB and Weston and Sampson have also done work for the Town in relation to the dam and Mill Pond in the past. The contract for the Feasibility Study was awarded to VHB at the Town Council meeting on August 19, 2019.

Reference: The Town Council minutes from the August 19, 2019 meeting can be viewed here
https://www.ci.durham.nh.us/sites/default/files/fileattachments/town_council/meeting/55041/081919.pdf

5. What is the process the Town would have to undertake to obtain the non-menace waiver that would be required by the NHDES Dam Bureau to move forward with dam stabilization?

Answer: The Mill Pond Dam is classified by NHDES Dam Bureau as a “low hazard dam” (rather than a “non-menace” dam). The Town would need to apply for a waiver from the NHDES Dam Bureau for reclassification of the structure to a non-menace dam, which would require clear demonstration that the waiver request meets several technical standards. As part of this process, the owners of the abutting land would have to enter into a legal agreement with the Town of Durham, where the owners would recognize and accept that flooding resulting from the current dam or its failure will have a detrimental impact on their property. This agreement would have to remain in place and be recorded at Strafford County Registry of Deeds to run with the land and would be binding to all future owners. If such an agreement can’t be secured, dam stabilization will not be an option and the Town would be required to construct an entirely new and larger dam according to modern standards for a low hazard dam, that does not require a waiver and that satisfies the dam safety requirements of the NHDES Dam Bureau.

Reference: Letter from NHDES Dam Bureau dated May 1, 2020 found here
https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/20200501_d071003_dam_status_follow-up.pdf

Impact on Taxpayers:

6. What is the estimated cost of dam stabilization and dam removal/river restoration to Durham taxpayers?

Preliminary Cost Estimates:

	Dam Stabilization	Dam Stabilization w/ Dredging	Dam Removal and River Restoration
Costs shown include Life Cycle Costs but exclude estimated external grant funding.	\$1,392,518	\$5,321,198	*\$1,462,950

*Dam Removal and River Restoration costs shown above do not reflect the fact that the Town anticipates a large majority (approximately 60% or \$875,000) of Dam Removal/River Restoration would be covered by various external grant programs, which would be consistent with other dam removal projects in our area and would lessen the overall project cost for Durham taxpayers.

Please note that these are planning level costs, which were developed during the feasibility study. Cost estimates would be further refined in Final Design and would need to include recent inflation in

construction costs, which have been substantial in 2021 with an expectation of continued inflation in 2022.

Costs include 30-year life cycle costs such as ongoing maintenance and invasive management. The dam stabilization costs assume that the Town secures the non-menace waiver from the NHDES Dam Bureau, and that dam stabilization is permissible (see question #5 above).

Reference: Oyster River Dam at Mill Pond Supplemental Analysis Public Questions and Comments, page 4 here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_-_supplemental_analysis_public_questions_and_comments.pdf

7. Will dam removal impact property values on the backwater?

Answer: According to the NH Department of Environmental Services, this is a difficult question to answer because it is very much dependent on the particular site and is strongly influenced by other things such as the real estate market, location in state, or other characteristics of the property. Studies have not shown strong correlations between dam removal and changes in property values. The existence or removal of a particular dam could be seen as a positive aspect to some potential buyers and a negative aspect to others.

Reference: NHDES Frequently Asked Questions about Dam Removal, 2020 found here <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/db-19.pdf>

Water Quality:

8. Is the Mill Pond an Impaired Water body? Why?

Answer: The Oyster River has water quality issues related, in part, to stagnant water conditions and nutrient loading in Mill Pond, causing eutrophication and algae blooms. The Mill Pond is listed as an impaired water body for aquatic life on the NHDES's Section 303(d) Clean Water Act priority list of impaired water bodies due to low dissolved oxygen (DO) and pH. Data collected in the study suggests that in certain years relatively large portions of the pond volume have critically low DO concentrations and provide habitat conditions that only allow the most tolerant aquatic species to survive or utilize the pond during these periods.

Reference: Oyster River Dam at Mill Pond Feasibility Study pages 3, 70-76 and here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_feasibility_study_-_final.pdf

9. Why can't the Town just dredge the Mill Pond?

Answer: Accumulating sediments and decaying plant matter have and continue to gradually fill in the Mill Pond. The feasibility study identified areas of the pond where dredging could be used to create open water in an attempt to improve both recreation opportunities and improve water quality. However, the regulatory agencies that approve dredging of freshwater ponds have expressed significant

concerns that would be very difficult to overcome. Dredging would be an ongoing maintenance task and cost that would be required in the future as the dredged areas would re-fill.

Reference: Oyster River Dam at Mill Pond Feasibility Study pages 11-12 here

https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_feasibility_study_-_final.pdf

10. If dredging cannot happen, why can't the Town of Durham clean up the water quality in the pond?

Answer: In the supplemental study, VHB estimated that for the Mill Pond to reach a nutrient loading level that would improve water quality, phosphorus loading across the entire Oyster River watershed would need to be reduced by 53% (or 2,685 lb/yr). This level of reduction would require a very significant regional multi-town investment of land and financial resources with contributions not just by the Town of Durham but also by other communities in the watershed including Lee, Nottingham, Barrington, and Madbury.

Reference: Oyster River Dam at Mill Pond Supplemental Analysis, pages ES-2 and ES-3 here

https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_-_supplemental_analysis_final.pdf

11. Is the Town of Durham in compliance with its EPA MS4 Stormwater Permit?

Answer: The Town is in compliance with its MS4 Stormwater permit. The MS4 permit requirements are divided into these six Minimum Control Measures (MCMs)

MCM #1 – Public Education and Outreach. The Town maintains compliance by sharing resources and information with the public on important practices for the management of yard waste and pet waste.

MCM #2 – Public Involvement and Participation. The Town maintains compliance by sharing its annual Stormwater Management Program and Annual Report to EPA on the Town's website and by educating the public and members of Town boards and commissions.

MCM #3 – Illicit Discharge and Elimination (IDDE). The Town maintains compliance by updating its IDDE plan and making it available to the public as well as completing the required outfall testing to find and eliminate illicit connections.

MCM #4 and MCM #5 – Construction Site Stormwater Runoff Control and Post Construction Stormwater Management in New Development and Redevelopment. The Town maintains compliance by enforcing its Site Plan Regulations including during the planning review process and post construction.

MCM #6 – Municipal Good Housekeeping and Pollution Prevention. The Town maintains compliance by establishing good housekeeping procedures for its Town Facilities, training Town staff on stormwater pollution prevention measures, and regularly updating Stormwater Pollution Prevention Plans for its facilities.

Additionally, the Town is subject to Appendix F and H of the MS4 permit which are related to requirements for the reduction of bacteria/pathogens, nitrogen, and chloride from its waters.

A full copy of the Town's Stormwater Management Plan and Permit can be viewed at <https://www.ci.durham.nh.us/publicworks/stormwater>

12. Is the EPA going to issue fines to the Town of Durham for not cleaning up the Mill Pond?

Answer: The EPA has given no indication of any fines or enforcement action related to the Mill Pond. Sediments from the watershed have accumulated in the pond over the long history of the Mill Pond Dam. This is a natural process and it is not uncommon for ponds to experience this condition in their life cycle. The Town is in compliance with the MS4 Stormwater Permit and has a long history of being a good environmental steward through its efforts with land conservation and water resources protection.

Environment:

13. What environmental implications are there to removing head of tide dams such as the Mill Pond Dam?

Answer: Head-of-tide dams eliminate a natural transition zone between saltwater and freshwater and thereby almost completely eliminate important brackish marsh habitats, including salt marshes, which are among the most productive ecosystems in the world and provide many services, such as habitat, food web support, and buffering from storms and pollution.

Removal of the Mill Pond Dam would cause substantial change which would decrease habitat for some warmwater species, while benefitting other species which prefer free-flowing riparian and wetland habitat. Many dam removals have occurred throughout the northeast and the nation, and the changes that result from returning a river to a free-flowing condition generally have been welcomed by the ecologists and resource managers involved in those projects since they tend to favor native/sustainable ecological processes and have demonstrable benefits. The impacts and benefits of dam removal have been documented in both peer-reviewed and unpublished literature.

The Town received comments from many environmental groups such as The Nature Conservancy, Piscataqua Region Estuaries Partnership (PREP), the Conservation Law Foundation, Trout Unlimited, Wild Rivers, American Saltwater Guides, Native Fish Coalition and others, all of which supported removal of the Mill Pond dam. No environmental groups wrote in favor of maintaining this head-of-tide dam.

Reference: Oyster River Dam at Mill Pond Supplemental Analysis Public Questions and Comments, page 7 here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_-_supplemental_analysis_public_questions_and_comments.pdf

14. How much river would be restored with dam removal with the water supply dam at UNH located upstream?

Answer: At least 2.6 river miles of stream habitat would be restored to a free-flowing condition if the head of tide dam were to be removed, including approximately 1.8 river miles on the Oyster River mainstem, 0.4 miles of Hamel Brook and 0.4 miles of College Brook.

Reference: Oyster River Dam at Mill Pond – Feasibility Study Town Council Questions, page 3, here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_-_questions_from_town_council_final.pdf

15. Could the water supply dam at UNH be retrofitted with a fish ladder if Mill Pond Dam is removed?

Answer: NH Fish and Game has indicated that the addition of a fish ladder at the UNH reservoir dam is likely to be feasible. It has been looked at by USFWS passage specialists and they feel it's "a great candidate for passage".

Reference: Resident Correspondence on Dam Volume 8 Searchable PDF, pages 7-10 here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/resident_correspondence_on_dam_volume_8.pdf

16. What affect would dam removal have on fish passage and populations, specifically Blueback Herring?

Answer: Based on direct consultation with fisheries managers at state and federal agencies, the presence of the head of tide dam adversely impacts the river herring population in the Oyster River, and removal would benefit the resource. Additionally, the presence of the dam is a primary factor in the local decline of the anadromous fish population due to the loss of habitat connectivity and declining water quality in the system.

Reference: Oyster River Dam at Mill Pond Supplemental Analysis Public Questions and Comments, page 6, 8 here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_-_supplemental_analysis_public_questions_and_comments.pdf

17. Are there pollutants trapped in the pond that would negatively impact the downstream portion of the Oyster River and Great Bay?

Answer: The presence of polycyclic aromatic hydrocarbons (PAHs) and metals that were found during sediment sampling of the pond is not unusual. PAHs are commonly found in urban stormwater and metals like arsenic are found in our NH granite state groundwater. Sediments that are removed from the Mill Pond as part of a dam removal and river restoration project will likely be tested again (as any standard permit by NHDES would require), however the testing would be to determine if special disposal methods would be required, not because of any risk to human health or the environment. VHB

testing has shown that similar materials are found both within the impoundment and downstream of the dam.

Reference: Oyster River Dam at Mill Pond Questions from Town Council, page 1 and 2, here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_-_questions_from_town_council_final.pdf

Final engineering design of dam removal would include a plan to stabilize any at-risk sediments identified. NHDES and the Army Corps would not approve a project that leaves unstable sediments within the restored channel or presents a significant ecological risk to downstream resources.

Reference: Oyster River Dam at Mill Pond Supplemental Analysis Public Questions and Comments, page 6, here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_-_supplemental_analysis_public_questions_and_comments.pdf

18. If the Mill Pond Dam were to be removed, will invasives take over the area including the backwater?

Answer: Invasive plant species are already present within and adjacent to the impoundment, and the Town of Durham has been working with the NH Department of Agriculture to control their presence. If the dam were to be removed, to support the restoration and protection of the native plant diversity, a comprehensive Integrative Vegetation Management Program (\$130,000 over 5 years) would be developed to manage the invasive species surrounding the Mill Pond and upstream. This would include implementation of mechanical, cultural, biological, and chemical methods over a 3 to 5-year time period and include actions before and after dam removal. Invasive management costs are included in the total cost figures shown in question 6.

Reference: Oyster River Dam at Mill Pond Supplemental Analysis, pages 40-46 here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_-_supplemental_analysis_final.pdf

Recreation:

19. Was recreation considered as part of the feasibility study?

Answer: Existing recreation was considered as part of the feasibility study in conjunction with conservation land. Changes to recreation were discussed with both dam removal and dam stabilization alternatives. The stretch of the Oyster River impounded by the dam provides recreational opportunities in the form of fishing, kayaking, boating, or ice skating on the water, and picnicking or birdwatching from one of the Town of Durham's publicly developed lands along the banks of the pond and river.

Dam stabilization would not change the existing recreational opportunities except that as the pond continues to fill with sediment there will be less open water to kayak or canoe.

Regarding the impacts on recreational activities within the Mill Pond impoundment area, the water depth would not support motorized or non-motorized boating, except for shallow draft kayaks and

canoes. While the abundance of recreational fishing locations would decrease in Mill Pond with dam removal, there would be an improvement in the fish passage from the upstream portions into the tidal portions of the Oyster River. In this scenario, winter ice skating on Mill Pond would no longer be viable. However, birdwatching as a form of recreation would not be negatively affected, as the expected wetland habitats are home to numerous species of birds.

Reference: Oyster River Dam at Mill Pond Feasibility Study page 79-81 here

https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_feasibility_study_-_final.pdf

20. Who has access to use the Mill Pond backwater? Does the public?

Answer: The Mill Pond and backwater is not easily accessed by the public. A majority of the pond and backwater shoreline is private property. Access from Mill Pond Road during the summer is limited due to excessive vegetative growth and algae. Accesses via the Milne Park is limited to a path and narrow entrance to the pond. Access during the winter, when the ice is safe, is readily available from Mill Pond Road.

History:

21. Is the Mill Pond Dam on the Oyster River a historic dam and what does this mean?

Answer: The Mill Pond Dam is a historic Ambursen-style dam constructed in 1913. The dam was constructed by Daniel Chesley, and the engineer was Professor Charles Hewitt. It is believed the dam was constructed under a license provided by the Ambursen Hydraulic Corporation. Ambursen dams were a unique buttress design that competed favorably against the traditional gravity dams of the era. Due to its age, engineering significance, and association with local history, the dam is listed on the NH Register of Historic Places.

Stabilizing the dam by encasing it in concrete will create a gravity dam, eliminating some aspects that make the historic dam unique. More information about the history of the dam can be found on the Durham Historic District and Heritage Commission webpage on the town website.

Reference: Oyster River Dam at Mill Pond Feasibility Study, Section 3.6 Cultural Resources, pages 76-79 here

https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_feasibility_study_-_final.pdf

Reference: Oyster River Dam on the Mill Pond

https://www.ci.durham.nh.us/sites/default/files/fileattachments/historic_district/heritage_commission/page/55265/history_of_dam_for_website.pdf

22. Will the history be preserved with Dam Removal?

Answer: Removal of the dam and restoration of the river channel would create a landscape that has not existed since the seventeenth century. It would restore the Oyster River as a free-flowing river, as it had been for thousands of years and as has been recommended by representatives of the Indigenous community.

The elimination of the dam would be an adverse effect under Section 106 of the National Historic Preservation Act, which would trigger a substantial mitigation effort to preserve the more recent industrial history of the dam and its role in the history of Durham. This would likely take the form of substantial signage and perhaps the preservation of a small portion of the existing structure. The Town has engaged with the NH Division of Historical Resources to continue to assess the effect of the project on the dam and adjacent historic district – regardless of the selected alternative.

Reference: Oyster River Dam at Mill Pond Feasibility Study, Section 3.6 Cultural Resources, pages 76-79 here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_feasibility_study_-_final.pdf

Scenic Impact:

23. What will the river look like if the dam is removed?

Answer: A portion of the river above the dam would become tidal. Active restoration of the Oyster River channel upstream of the dam removal site is planned. This would involve channel shaping approximately 600 feet upstream of the location of the dam to stabilize the channel and remove approximately 3,000 cubic yards of sediment unnaturally deposited in the center of the Mill Pond impoundment. Placement of stable streambed materials may be used to control the risk of erosion and create conditions favorable to aquatic habitat for upstream fish passage once flow is returned to the full channel. Following the project completion and for years after, the river will naturally re-establish itself with different wetland plant growth for areas of fresh water, brackish water, and tidal waters.

Reference: Oyster River Dam at Mill Pond Feasibility Study Section 2.8 page 12 here https://www.ci.durham.nh.us/sites/default/files/fileattachments/public_works/page/54315/oyster_river_dam_at_mill_pond_feasibility_study_-_final.pdf