Technical Memorandum

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Via Email:	ginabushong@gmail.com
To:	Gina Bushong, Orland Select Board
From:	Gillian Williams, P.E. and Charles Grant, P.E., S.E. (MA)
cc:	Narramissic Watershed Coalition
Date:	August 18, 2025
Re:	Phase I – Site Visit and Due Diligence Assistance Alamoosook (ME00144) and Toddy Pond (ME00146) Dams Orland, Maine
Project No.	2502852

We understand that the Towns of Orland, Surry, Penobscot, and Blue Hill are considering acquiring Alamoosook and Toddy Pond Dams from the current dam owner, Bucksport Mill LLC, to preserve the lakes. Bucksport Mill LLC has filed a petition with the Maine Department of Environmental Protection to relinquish dam ownership and water level maintenance. Alamoosook Lake and Toddy Pond have significant economic, recreational, and ecological importance to the region. Because of the importance of the dams and reservoirs to the region, the towns have formed the Narramissic Watershed Coalition (NWC) to perform due diligence on the dams and negotiate a potential acquisition of the structures.

In accordance with our Phase I proposal dated April 29, 2025, we have 1) reviewed available background information, 2) performed site visits, and 3) prepared conclusions and recommendations related to potential maintenance and capital expenditures at the projects.

Toddy Pond Dam

Review of Available Information

Background

Toddy Pond Dam was built in 1921 (Haley Ward, Inc., 2024c) and is located at the outlet of Toddy Pond in the Town of Orland, Maine. From left[1] to right, the dam consists of a left embankment with an upstream concrete retaining wall (referred to as a concrete wall or core wall in Figures 1 and 2), spillway consisting of two masonry overflow sections and a central gate structure, a fishway, and the right embankment with an upstream concrete retaining wall. Toddy Pond is currently used for recreation. The dam raises Toddy Pond by approximately 8 feet (Haley Ward, Inc., 2024c).

No original drawings of the dam are known to exist. The structure was surveyed by Kleinschmidt Associates for the purposes of breach analysis, and drawings were produced in 1998 from this survey

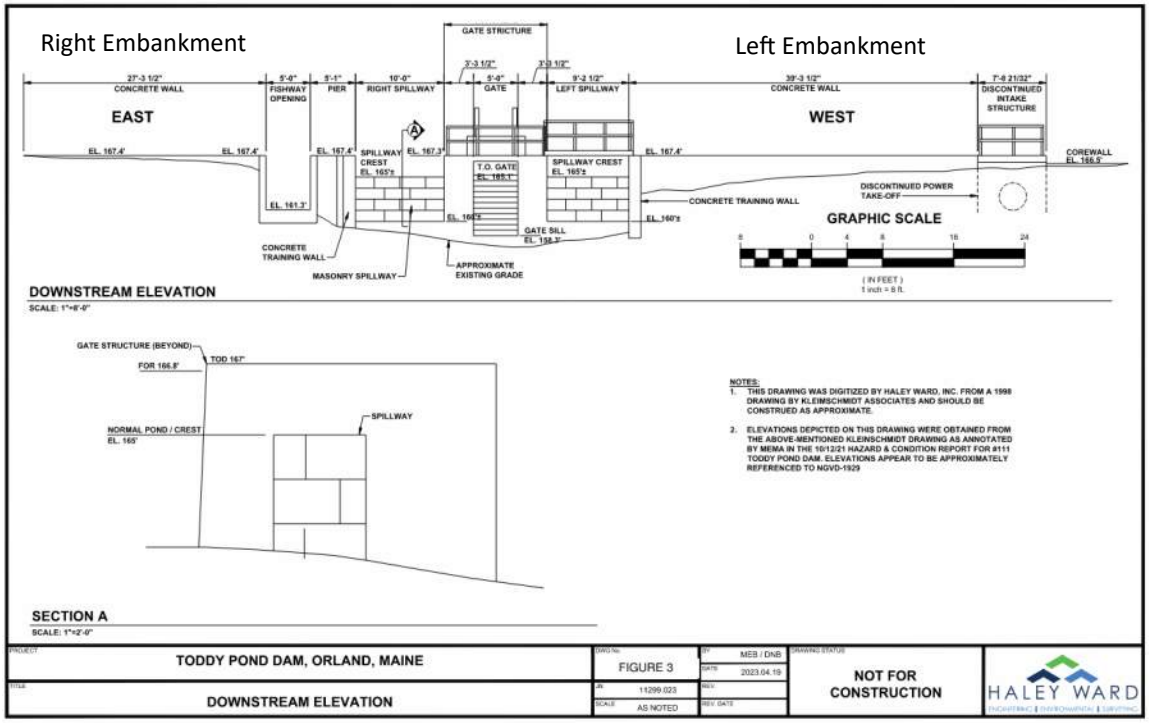
[1] Left and right are from the vantage of looking downstream.

(Fletcher, Tony, 2021b). A survey plan of the Toddy Pond Bridge dated May 4, 1925, and detailed drawings of the bridge dated March 3, 1926, are included in the 2024 Operations and Maintenance Manual (Haley Ward, Inc., 2024c).

There is a 5-foot-wide wooden sluice gate with a sill at El. 158.3[2] at the center of the spillway. The top of the gate is at El. 165.1, and the gate is operated from the operator deck at El. 167.3. The operator deck is accessed by a wooden walkway from the left embankment. The gate has 3.3-foot-wide concrete piers on either side. Granite masonry overflow spillways abut the gate structure piers and are approximately 4 feet thick (upstream to downstream direction). The west (left) overflow spillway has a length of 9.2 feet, the east (right) overflow spillway has a length of 10 feet, and both spillway sills are at El. 165 (Bucksport Mill LLC, 2025b).

East (right) of the spillway is a 5.1-foot-wide concrete pier and a 5-foot-wide fish passage. The right embankment has an upstream concrete retaining wall and is 27.3 feet long with a crest at El. 167.4 (Fletcher, Tony, 2021b).

Figure 1. Elevation and Section Views of Toddy Pond Dam (Haley Ward, Inc., 2024c)



Source: (Haley Ward, Inc., 2024a)

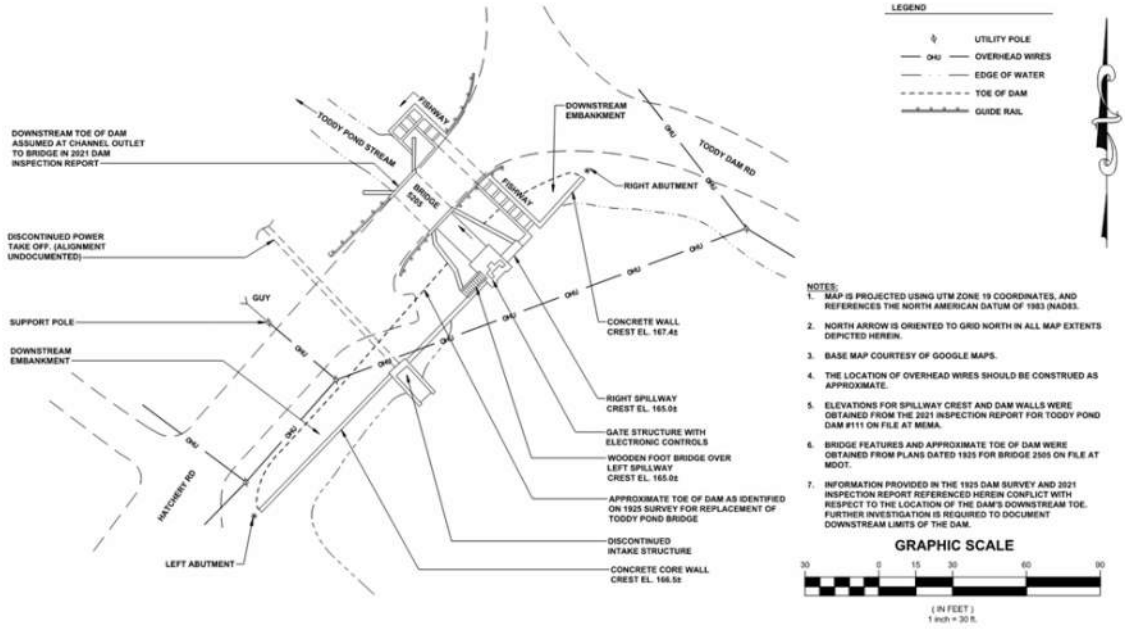
West (left) of the spillway is the left embankment with an upstream concrete retaining wall at El. 167.4. There is a discontinued intake structure and power take off (i.e., conduit buried within the left

[2] Elevations in this memo are referenced to the National Geodetic Vertical Datum of 1929 (NGVD29) in feet unless otherwise noted. For Toddy Pond, NGVD29 was noted to have been converted from the site datum which is an estimated 65 feet higher than USGS data (Bucksport Mill LLC, 2025b). At Alamoosook Dam, NGVD29 was reported to have been converted from the site datum which is an estimated 100 feet higher than USGS data (Bucksport Mill LLC, 2025a).

embankment) that are located 39.3 feet left of the spillway. It is unknown how the conduit was abandoned or where the conduit outlets. The top of the concrete retaining wall is at El. 167.4 from the spillway to the intake structure and steps down to El. 166.5 left of the intake structure. The top of the concrete retaining wall is 1.4 feet thick. The concrete retaining wall extends nearly 82 feet from the spillway to a house that is located on the shoreline of the Toddy Pond outlet basin (Bucksport Mill LLC, 2025b).

Downstream of the spillway is a concrete apron that slopes down to El. 152.7 below the Hatchery Road Bridge. The bridge has an opening of 11.4 feet and a low chord at El. 160.5. The bridge deck crown is at approximately El. 164 (Bucksport Mill LLC, 2025b).

Figure 2. Plan View of Toddy Pond Dam (Haley Ward, Inc., 2024c)



Source: (Haley Ward, Inc., 2024a)

Toddy Pond Dam impounds approximately 19,658 acre-feet of water at normal pond El. 165. The surface area of Toddy Pond is approximately 2,360 acres. The drainage area is 25 square miles (Bucksport Mill LLC, 2025b).

Toddy Pond Stream flows from Toddy Pond to Alamoosook Lake, a distance of approximately 0.7 miles. Normal pool at Alamoosook Lake is El. 21, 144 feet lower than Toddy Pond's normal pool El. 165.

Inspection History

- **June 27, 2013:** A dive inspection of Toddy Pond Dam was conducted by Commercial Divers Inc. on June 27, 2013. Inspection notes from this inspection are available. GEI is not aware of a written report of this inspection.

- **August 6-7, 2014:** A dive inspection of Toddy Pond Dam was conducted by Commercial Divers Inc. on August 6-7, 2014. Inspection notes from this inspection are available. GEI is not aware of a written report of this inspection.
- **August 5, 2015:** A dive inspection of Toddy Pond Dam was conducted by Commercial Divers, Inc.
- **October 14, 2015**: Toddy Pond Dam was inspected by Kleinschmidt on October 14, 2015. A Dam Condition Assessment dated November 19, 2015, was prepared by Kleinschmidt for Bucksport Generation LLC.
- **October 12, 2021:** Toddy Pond Dam was inspected by the acting state dam inspector, Tony Fletcher, PE, on October 12, 2021. A hazard and condition report was prepared for the Operations Director of the Maine Emergency Management Agency (MEMA) and the MEMA Dam Safety Office (Fletcher, Tony, 2021b).
- **May 22, 2024:** The dam was visually inspected by Haley Ward on May 22, 2024. A report documenting the findings of the inspection was prepared for AIM Development USA, LLC and Bucksport Mill, LLC (Haley Ward, Inc., 2024a).
- **October 2024:** An Operations and Maintenance Manual, revised in October 2024, was prepared by Haley Ward, Inc. for Bucksport Mill LLC (Haley Ward, Inc., 2024c).
- **April 25, 2025:** In response to a letter from the Toddy Pond Association expressing concerns that the dam owner had not implemented the recommendations from previous inspections, the Toddy Pond Dam was inspected on April 15, 2025, by the acting state dam inspector, Tony Fletcher. An inspection report was prepared for the director of the Operations & Response Division of MEMA (Fletcher, Tony, 2025).

Findings and recommendations from these reports are included below.

June 27, 2013, Dive Inspection by Commercial Divers Inc.

- The wood of the control gate is soft/rotted.
- The concrete walls of the gate piers need repair.

August 6-7, 2014, Dive Inspection by Commercial Divers Inc.

- The wood of the control gate is soft/rotted.
- The concrete walls of the gate piers need repair.
- Seepage was noted on the downstream face of the granite walls.
- Flow was noted at the interface of the gate and the adjacent piers on the downstream side.
- Holes in the grassy area downstream of the dam were observed.

August 5, 2015, Dive Inspection by Commercial Divers Inc.

- Broken concrete from freeze-thaw effects was noted on the walls of the gate pier.
- Epoxy repairs performed the previous year to cracks on the upstream face of the dam were intact.
- Small cracks were observed around the piers and granite walls. Seepage was observed.
- The inspection report indicates that routine rejointing of the seams of the granite block wall with Splash zone underwater epoxy has been very successful in reducing leaks.

October 14, 2015, Inspection by Kleinschmidt

The following observations and recommendations were included in the Dam Safety Assessment (Kleinschmidt, 2015b).

- Delaminated concrete was observed on the left wall of the fish passage structure. At the time of the inspection, this was not considered a structural or dam safety concern. It was recommended that this area be repaired by chipping away the deteriorated concrete down to sound concrete and resurfacing.
- Some seepage was observed at the interface of the right granite spillway with the concrete pier on the left side. This was not considered to be an immediate concern and deemed typical of a granite block structure.
- Some vegetative growth was observed on the apron downstream of the right spillway. Vegetation should be removed from the downstream aprons and the face of the granite blocks.
- The outside of the right gate pier had a large area of concrete delamination working up from the interface with the gate sluice surface. The interiors of both concrete piers showed large amounts of concrete scour and delamination downstream of the gate. There was a large leak on the left pier that appeared to originate from the upstream face of the gate structure. It was recommended that deteriorated concrete be chipped away down to sound concrete and the piers be resurfaced.
- The gate appeared to be in poor condition. It had been covered with polymer plastic on the upstream face to help prevent leakage through the boards. It was recommended that the gate be replaced in kind or with a steel gate.
- Seepage was observed on the left spillway's interface with the concrete pier on the right side.
- The concrete apron downstream of the left spillway appears to have eroded. Large rocks, possibly cyclopean concrete aggregate, are visible. Seepage is reported to be observed between the rocks and the concrete. It was recommended that shotcrete be applied to the surface of the apron and the area sealed within the next year from the date of the inspection.
- A small sinkhole was observed on the embankment on the left side of the dam, near the intersection of the Hatchery Road bridge and the left abutment wall. It was recommended that the sinkhole be filled in and monitored.

- It was recommended that the structure and embankment continue to be monitored for development of leaks, deteriorated concrete, signs of movement (i.e., leaning or bowing of abutment walls) and signs of seepage.
- It was recommended that the dam be inspected every 5 years to monitor the condition of the dam.

October 12, 2021, Inspection by Tony Fletcher (MEMA)

Both abutments, the top of the dam, the upstream wave protection (where possible), the downstream surfaces, the embankments, spillways, gate structure, and walkway were inspected on October 12, 2021. The bridge under Hatchery Road and the fishway were not inspected. Gate leakage was not measured, and the gate was not operated. The following inspection findings were noted in the hazard and condition report (Fletcher, Tony, 2021b).

- Brush growing upstream of the dam.
- Debris on the spillway.
- Irregular settlement of the embankments.
- Scour and cracking of the gate piers.
- Disintegration of mortar in the stonework.
- Gate leakage.
- Walkway deflection.

There was no evidence of recent movement or incipient failure observed. The hazard and condition report indicates that the spillways are not adequate to pass the 50-year storm (Fletcher, Tony, 2021b).

May 22, 2024, Inspection by Haley Ward

A gate prevented access to the gate mechanism and pool area of Toddy Pond at the time of the inspection. The dam did not appear to show signs of imminent failure. The observations identified during the October 2021 inspection appeared not to have changed or worsened. The following recommendations were made (Haley Ward, Inc., 2024a).

- Retain the services of a commercial diver to complete an underwater inspection of the dam structures and head gate, especially around the known leaking areas.
- Complete coring of various concrete elements and test for ASR deterioration.
- Develop a design to repair deteriorated concrete elements and address the leakage around the head gate.
- Remove vegetation and debris on the upstream face of the dam and stabilize with stone riprap.

April 15, 2025, Inspection by Tony Fletcher (MEMA)

The following inspection findings were included in the report (Fletcher, Tony, 2025).

- No debris blocked the spillways.
- The concrete cutoff wall in the embankments was weathered but showed no movement or seepage.
- The wooden bridge over the left spillway channel is deflected and unsafe for pedestrians.
- The concrete slab over the left spillway which supports the gate needs inspection from underneath.
- Water flow in the downstream channel prevented inspection of the spillway channel and bridge opening.
- The left spillway overflowed at a rate approximately six times greater than the right.
- The left pier is being undercut near its foundation by water flowing from the gate.
- Both piers are cracked horizontally at about 1 to 2 feet above the channel floor.
- The entrance to the fishway channel is cracked.

The inspection indicated no developing defects in the embankments, but the spillway and downstream channel showed defects that indicate the spillway is structurally unstable. The following recommendations were made.

- Warn pedestrians that the wooden bridge over the left spillway is unsafe. Replace the bridge as soon as possible.
- Drain the head pond then inspect the upstream face of the dam in dry conditions.
- Employ an expert in dam design and construction to inspect the outlet works dry with MEMA present, report findings and recommended repairs to the dam owner and MEMA.
- The dam Operations and Maintenance Manual must be discussed with the State Dam Inspector (SDI).
- The breach standards for the Toddy Pond Dam EAP must be discussed with the SDI before breach maps are made.
- The dam owner must arrange a “tabletop exercise” (TTX) of the EAP before fall of 2025 in cooperation with MEMA.

Site Inspection

On Friday, June 27, 2025, GEI performed site visits at Toddy Pond Dam and Alamoosook Dam. The principal participants at the site visits included:

- Marc Chmura, P.E. – GEI Consultants, Inc.
- Ali Brady, E.I. – GEI Consultants, Inc.

- Wesley Shute – former dam operator
- Justin – current dam operator
- Gina Bushong – Orland Select Board
- Russ Pierce
- Kat Joyce – Bernstein Shur

At the time of the inspection, the weather was 70°F and sunny.

Photographs taken during the site inspection at Toddy Pond Dam are included in Appendix A. The sluice gate is reported to be operated 1 to 2 times per month to manage the level of Toddy Pond. The target water elevation of the pond is approximately 99.8 ft, as read on the staff gage attached to the upstream portion of the gatehouse. The water level read 99.6 ft on the staff gage after the gate was opened during the inspection. The dam was found to be in POOR condition. The primary reason is due to the overall concrete condition. Observations are identified in more detail in the following sections.

Left Embankment

The embankment between the left concrete retaining wall and Hatchery Road was partially mowed (Photo 5). The embankment downstream of Hatchery Road was estimated to be approximately 2V:1H. Heavy vegetation, including mature trees, was observed on the embankment downstream of Hatchery Road (Photo 6). Vegetation was also observed upstream of the left retaining wall (Photo 2). Spalling and efflorescence were observed on the left retaining wall (Photos 3, 4, and 5).

Gina Bushong reported that the old intake pipe is speculated to have been once connected to a power generation plant, though a plant no longer exists. There is significant vegetation growth on top of the old intake structure and along the embankments on either side (Photos 1 and 12). An outlet for the intake pipe was not found during the inspection.

Spillway

The condition of the granite block overflow spillways was consistent with previous inspection reports. Young vegetation was observed growing on the crest and the downstream face of the right overflow spillway (Photos 3 and 7). Branches were observed on both spillway crests. Voids between granite blocks were observed on the downstream faces of the spillways. Seepage was observed coming from the bottom of the spillway walls. The rate of the seepage was estimated to be approximately 1 to 2 gallons per minute for each of the spillways (Photo 23).

The gate structure was in poor condition. Section loss was evident on the concrete piers of the gate structure at the interface of the piers and the apron. Concrete was also observed to be missing from the inner face of the right pier. Plywood appeared to have been placed over an area of concrete loss on the inner face of the right pier, as well as at the inner face of the left pier where it meets the apron (Photos 7, 9, and 10). Horizontal cracking was observed on the piers of the gate structure approximately 1 to 2 feet above the apron. Concrete loss was observed on the approximately 1 to 1.5 feet of concrete above

the headwater elevation on the upstream walls of the gate structure (Photos 3 and 4). The railing around the operator platform on top of the gate structure is stainless steel and appears to be in good condition.

The deck of the gate structure appears to be deflected. This is evidenced by the connection of the stainless-steel railing to the concrete slab (Photo 8). The bottoms of the two outer downstream-most railing posts are flush with the concrete slab of the gatehouse, but the bottom of the center downstream-most railing is approximately ¼ to ½ inch above the concrete slab. This suggests that the center of the concrete slab sags below the edges of the slab. The gate was reported to have been replaced in 2015. Beavers are reported to periodically block the gate and fishway intakes with mud. The gate intake is cleared by opening the gate. The gate is operated with a handheld battery-operated drill. Rust was observed on the gate mechanism on the operator platform (Photo 25). The gate was opened several inches during the inspection using a battery powered hand drill. No issues with gate operation were noted during the inspection. The gate components and gears were reported to have been recently greased.

The timber access bridge from the left embankment to the gate structure operator platform shows signs of deflecting (Photos 4 and 7). This is consistent with observations made in the April 25, 2025, inspection by Tony Fletcher.

The concrete apron downstream of the spillways and gate structure was in poor condition (Photo 7). Significant cracking and section loss was observed. Exposed steel mesh reinforcing was observed. Branches and vegetation were observed on the apron. The concrete was patched in the past but appeared to be separating from the original concrete. When the gate was opened, water was observed to flow under portions of the concrete. Epoxy grout was reported to have been applied to the upstream faces of the dam by divers in 2012 or 2013. While Figure 1 indicates that the sills of the left and right overflow spillways are both at El. 165, observations during the field visit indicate that the sill at the right spillway is approximately 2 inches higher than the left spillway (Photos 3 and 4).

Spalling and efflorescence were observed on the right retaining wall adjacent to the spillway channel. (Photo 11). The wall is granite masonry immediately downstream of the spillway. It transitions to concrete after approximately 5 feet.

The left retaining wall is granite masonry immediately downstream of the spillway (Photo 24). It transitions to concrete after approximately 5 feet. The concrete appeared to be in fair condition. Small trees were observed growing on top of the concrete wall.

Fishway

The fishway was in fair condition. At least four of the bars of the trash rack in front of the fishway intake appeared to have been replaced with stainless steel bars (Photos 1 and 18). The other bars show signs of rust, but no obvious section loss was observed. Debris was observed at the top of the fishway but was blocked from traveling farther downstream by the first fishway baffle. A prior concrete repair was evident on the top of the left wall of the fishway, near the inlet (Photo 16). The new concrete appeared to be separating from the original concrete. Cracking was observed on the inner face of the right wall near the inlet (Photo 22). The grassy area to the right of the fishway appeared to be recently mowed, but vegetation was observed in the area between the fishway and the right spillway and along the section of

chain link fence parallel with Hatchery Road. Significant vegetation growth was observed on the embankment downstream of Hatchery Road. At the fishway outlet, the fishway walls exhibited concrete loss approximately 6 to 12 inches above the tailwater elevation (Photo 13). The wall between the fishway outlet and the right downstream wingwall of the Hatchery Road bridge also exhibited section loss at approximately 6 to 12 inches above the tailwater elevation. The upper part of the wall showed signs of spalling and wear. The part of the wall immediately adjacent to the fishway appeared to have been repaired. The fishway is reported to be heavily used by alewives. The fishway baffles are reported to have been replaced in 2012 (Photo 19).

Right Embankment

The embankment between the right upstream concrete retaining wall and Hatchery Road was mowed (Photo 21). The embankment downstream of Hatchery Road was estimated to be approximately 2V:1H. Heavy vegetation was observed on the embankment downstream of Hatchery Road (Photo 13).

Cracking and concrete loss were observed at the right end of the retaining wall (Photo 21). Vegetation was observed upstream of the retaining wall (Photo 2).

Hatchery Road Bridge

The Hatchery Road bridge downstream wingwalls exhibited concrete loss approximately 6 to 12 inches above the tailwater elevation (Photos 13 and 14). Cracking and efflorescence were observed on both downstream wingwalls. The bridge deck appeared to be in good condition. Cracking, efflorescence, and some spalling was visible on the walls under the bridge deck (Photo 20).

Conclusions and Recommendations

In general, we did not observe immediate dam safety concerns at the dam, but there is a lack of engineering analyses and studies to evaluate the stability and hydraulic capacity of the dam. Repairs are needed to address deferred maintenance deficiencies, and engineering studies are required to evaluate and upgrade the dam to meet modern dam safety standards. Detailed conclusions and recommendations are presented below.

Conclusions

- The embankments have significant vegetation, including large trees, which should be removed. Vegetation can lead to preferential seepage paths and failure of the embankments.
- The concrete structures have significant concrete deterioration and spalling, which is a maintenance concern and should be repaired.
- Gates and operators need annual maintenance to lubricate the gate and check the hoist system to keep it in good working condition.
- The method of abandonment of the discontinued intake structure is not known. Typically pipe abandonments would be performed by bulkheading and filling the conduit with grout, but it is not known if this was performed. Additionally, the location of the pipe outlet is not known. Penetrations through an embankment (such as this conduit) can be a preferential seepage path

and lead to internal erosion and failure of embankments. Operators should monitor for seepage, sediment, and/or sinkholes along the conduit alignment.

- Preliminary hydrologic and hydraulic estimates performed by Tony Fletcher of MEMA as part of the 2021 inspection indicates that the dam is not capable of passing the 50-year storm. For high hazard dams, a typical inflow design storm requirement is for the dam to be able to safely pass the ½ Probable Maximum Flood (PMF), which would likely require significantly more discharge capacity than is currently available.
- The walking access to the gate operators on the gate structure is unsafe.

Recommendations and Preliminary Cost Estimates

We have provided recommendations to address:

- Maintenance and higher priority considerations (short-term recommendations).
- Engineering studies and field investigations (intermediate recommendations).
- Major dam upgrades to meet modern day safety standards (long-term recommendations).

Short Term Recommendations (1 to 2 years)

- Cut and maintain vegetation on the embankment slopes within 15 feet of the extents of the dam. We note that this includes the downstream roadway embankment, which we consider part of the dam structure. Grass should be mowed, and brush on the upstream slopes should be removed. Trees should be cut about 1 foot above the ground surface, and the stumps coated with a sealant to slow decay. Stumps should not be removed as part of this effort. Stump removal is a greater effort, which includes lowering the reservoir, excavating to remove stumps and large roots, properly backfilling, and compacting the excavation, and placing topsoil, seed, and mulch. Stump removal should be performed as part of a larger rehabilitation to save costs.
- Replace the wooden access bridge for operator safety.
- Perform concrete repair and maintenance, which could include grouting cracks or chipping/cleaning spalled areas and patching concrete. We recommend that a technical specification and engineering repair drawings be prepared for contractor bidding purposes. We can provide the bid package for an additional cost.
- Inspect and maintain sluice gate and gate components at least annually.
- Operators should perform periodic inspections of the dam to look for changing conditions – including continued concrete deterioration, cracking, rotating of concrete walls, seepage, sloughing, and sinkholes. Special inspections should also be performed after significant flood events or felt earthquakes at the site. Changing conditions should be brought to attention of the dam owner and engineer for dam safety considerations.

Intermediate Recommendations (1 to 5 years)

- Perform an inflow design flood study to estimate the appropriate inflow design flood and hazard classification. We estimate this study would be approximately $50,000 (in 2025 dollars) based on

GEI's recent experience with other projects. However, if this analysis is performed in conjunction with an inflow design flood study for Alamoosook Dam, there would be a cost savings in performing the two studies at the same time.

- Perform engineering analyses for seepage and stability of the left embankment and stability of the concrete structures. This would likely include the following components. The estimated cost would be approximately $75,000 to $100,000 based on similar projects that GEI has recently completed.
    - Perform a topographic survey.
    - Inspect the discontinued intake structure and conduit.
    - A geotechnical field investigation consisting of several borings to evaluate the subsurface conditions.
    - Geotechnical seepage and stability modeling of the left embankment.
    - Perform structural stability calculations for the spillway and retaining walls.
- After the engineering analyses described above are completed, perform a feasibility study for repair or replacement of the dam structure. The feasibility study will inform you of the capital needed for completion of the long-term recommendations. The budget cost for the feasibility study is $75,000.

Long Term Recommendations (5 to 10 years)

Develop a capital expenditure plan to evaluate upgrades to the dam and perform engineering design for the upgrades. This would likely include the following upgrades, but would be dependent on the results of the engineering studies performed for the intermediate recommendations:

- Increase the hydraulic capacity of the dam based on the inflow design flood study. This could include a replacement or significant upgrades to the spillway.
- Perform deliberate concrete repairs to any concrete structures not repaired or replaced as part of spillway capacity improvements.
- Remove tree stumps and flatten the downstream slope of the dam (downstream side of the roadway embankment). This would likely also include constructing a filtered toe drain and abandonment of the discontinued intake pipe.

It is not possible to estimate the cost of dam upgrades at this time because the engineering evaluations have not been completed. We have included Table 1 at the end of this letter with a comparison of recent dam rehabilitation projects in the region with a brief scope of work to inform the NWC of potential construction costs.

Alamoosook Dam

Review of Available Information

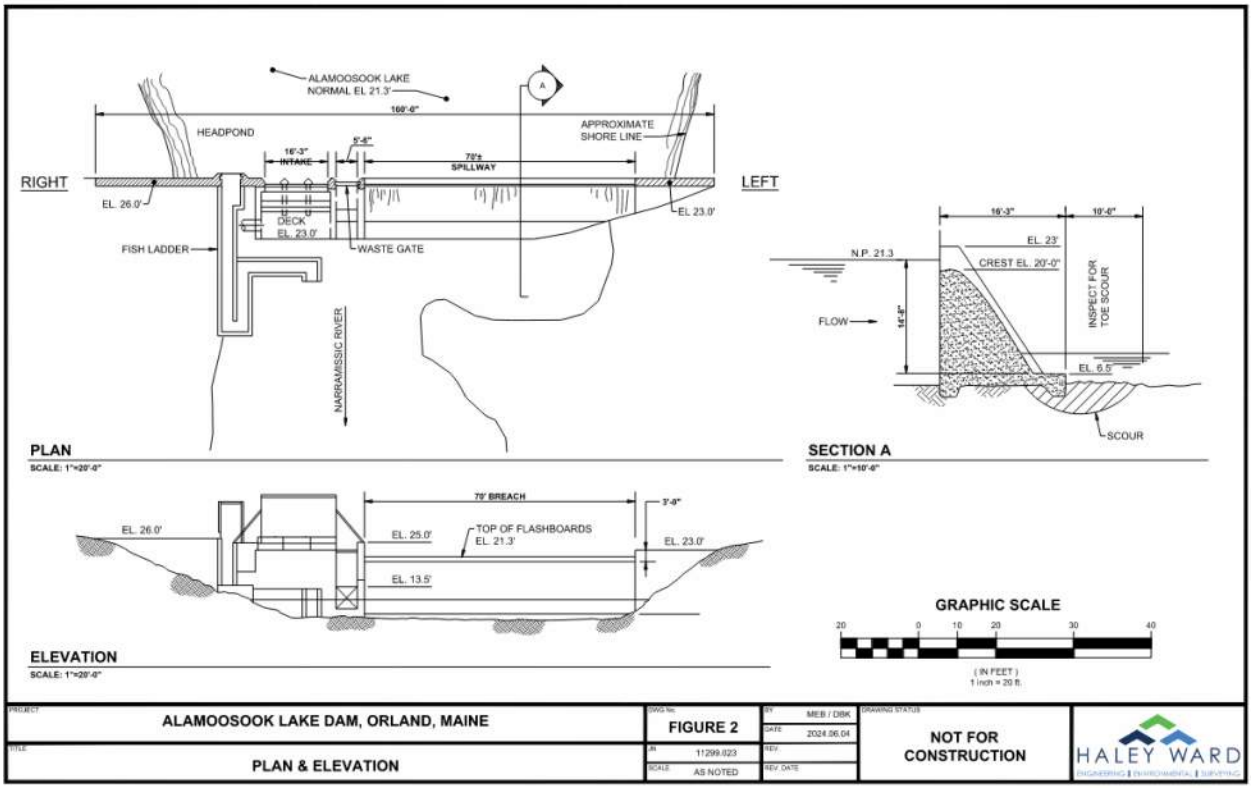
Background

The Alamoosook Dam was built in 1930 (USACE, 2024). It is located at the outlet of Alamoosook Lake in the Town of Orland, Maine, at the head of the Narramissic River. It is a concrete gravity structure with a sluice gate, intake structure, spillway, fish ladder, and abutment sections. The dam regulates the water level of Alamoosook Lake. A pump station, located approximately 250 feet downstream of the Alamoosook Lake Dam, is used to pipe water overland from Alamoosook Lake to Silver Lake in the Town of Bucksport. Silver Lake serves as the supply reservoir for the Town of Bucksport and Bucksport Generation LLC. A fish ladder in the dam provides passage for the seasonal migration of alewives (Bucksport Mill LLC, 2025a).

From left to right, the dam consists of the left abutment, 70-foot-long ogee spillway with 1.3-foot-high flashboards, waste sluice gate, intake, fishway, and right abutment, as shown in Figure 3. The south (left) abutment, which ties into bedrock, consists of a 2-foot-wide concrete wall with the top of wall at El. 23. The left abutment wall is approximately 15 feet long. A concrete ogee spillway approximately 70 feet long extends from the left abutment to the gate structure. The concrete sill is at El. 20, and the 1.3-foot-high flashboards bring the normal pond to El. 21.3. The ogee structure is about 15 feet high.

The wooden sluice waste gate to the right of the ogee spillway is reported to be 5 feet wide with a sill at El. 13.5 (Haley Ward, Inc., 2024b). However, based on Figure 3, it appears that the top of the gate is at El. 13.5. The concrete intake structure is located to the right of the gate structure. The top of the intake structure is at El. 25. To the right of the intake is the fish ladder and the right abutment. The north (right) abutment consists of a 2-foot-wide concrete wall with the top of wall at El. 26 feet and is approximately 30 feet long. There is an access walkway extending from the right abutment, over the fishway, to the intake structure.

Figure 3. Elevation and Section Views of Alamoosook Lake Dam (Haley Ward, Inc., 2024b)



Source: (Haley Ward, Inc., 2024b)

The Alamoosook Lake Dam impounds approximately 6,973 acre-feet of water at normal pond El. 21.3. The surface area of Alamoosook Lake is 1,180 acres. The drainage area is 94 square miles (Bucksport Mill LLC, 2025a).

Lake level records from January 1960 through August 1998 indicate a peak lake level of El. 25 occurred in December 1969 (Bucksport Mill LLC, 2025a). Based on an average annual flow of 2 cubic feet per second per square mile for Maine watersheds and the drainage area of 94 square miles for Alamoosook Lake, the average annual flow for Alamoosook Lake is estimated to be 188 cfs (Bucksport Mill LLC, 2025a).

Inspection History

- **June 27, 2013:** A dive inspection was conducted by Commercial Divers Inc. on June 27, 2013. Inspection notes from this inspection are available. GEI is not aware of a written report of this inspection.
- **August 8, 2014:** A dive inspection was conducted by Commercial Divers Inc. on August 8, 2014. Inspection notes from this inspection are available. GEI is not aware of a written report of this inspection.
- **August 4, 2015:** A dive inspection was conducted by Commercial Divers Inc. on August 4, 2015.
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- **October 12, 2021:** The Alamoosook Lake Dam was inspected by the acting state dam inspector, Tony Fletcher, PE, on October 12, 2021. A hazard and condition report was prepared for the Operations Director of the MEMA (Fletcher, Tony, 2021a).
- **June 12, 2024:** A dive inspection was conducted by Commercial Divers Inc. on June 12, 2024.

Findings and recommendations from these reports are included below.

June 27, 2013, Dive Inspection by Commercial Divers Inc.

- Undermining in the downstream areas of the fishway, intake, and spillway was noted.
- Cracks and holes in concrete were noted on the upstream face of the dam.

August 8, 2014, Dive Inspection by Commercial Divers Inc.

- Scour was noted at the downstream toe of the fishway.

August 4, 2015, Dive Inspection by Commercial Divers Inc.

- Riprap appeared to be missing from the outside edge of the concrete base pier of the steel X support column of the fishway near the center of the stream.
- An area of scour approximately 10 feet wide, 0.5 to 2 feet high, and 6 to 8 feet deep beneath the structure was noted at the downstream footing of the screen house.
- Epoxy and concrete repairs to the upstream face of the dam undertaken the previous year appeared to be in good condition.
- A small hole in the splash board area was repaired with underwater Epoxy at the time of the inspection.

October 14, 2015, Inspection by Kleinschmidt

- The right abutment wing wall was in good condition with signs of alkali-silica reactivity (ASR). The ASR did not appear to be extensive enough to cause a structural concern.
- The riprapped right embankment slope downstream of the wing wall had some vegetative growth. It was recommended that this be removed to prevent larger bushes and trees from rooting.
- The fish passage structure was in good condition above the water level. The inspection report notes the observation of missing riprap from the August 4, 2015, dive inspection. As drawings showing the underside of the concrete flume where it enters the tailrace are not available, it is not known how much of the flume the cross brace (X column) is designed to support. Kleinschmidt recommended re-riprapping the area at a minimum but recommended using pump grout bags to support the underside of the fish passage where the scour is occurring for a longer-term solution.
- The pump intake structure was in good condition above the water level. The inspection cites the August 4, 2015, dive inspection, which noted that an area of scour 10 feet wide, 0.5 to 2 feet

high, and 6 to 8 feet deep existed below the footing of the pump house intake structure. Kleinschmidt notes that drawings indicate the concrete floor is 4.5 feet thick, so it can likely support the cantilevered forces from the unsupported base. Kleinschmidt is unsure at what water level the structure may become unstable. Kleinschmidt recommends performing stability analysis of the intake structure to determine its current stability or using pump grout bags to support the underside of the intake structure in the short-term. Kleinschmidt recommends a complete repair in the next few years of the inspection. Such a repair would involve forming up the base of the intake structure and pumping new concrete into the soured area. The toe of the structure should then be riprapped with large boulders to prevent future scour.

- The concrete spillway appeared to be in good condition, though there was leakage beneath the flashboards.
- The left abutment was not inspected.

October 12, 2021, Inspection by Tony Fletcher (MEMA)

The left abutment and non-overflow section of the dam wall, right abutment, security fencing, upstream concrete face, downstream concrete face, and gate structure were visually inspected. The gate was not operated. The following observations were included in the inspection report (Fletcher, Tony, 2021a).

- Horizontal cracking was observed on the left non-overflow part of the dam.
- Trees and brush were within 20 feet of the dam on both sides of the river.
- There was general deterioration of all concrete work (cracking, spalling, crazing, and possibly ASR).
- The ogee spillway (which was dry at the time of the inspection) was flaking and had moss or algae growing on its downstream surface.
- Fencing and gantries were bent in places and showed signs of corrosion.
- Although no movement or misalignment of the monolith was seen, it appeared that horizontal sliding or overturning of the left (looking downstream) non-overflow section was imminent.

The following recommendations were made.

- Root out all brush and trees within 20 feet of the dam. Restore the lawn.
- Repair cracks in the concrete non-overflow section of the left abutment.
- Rehabilitate decayed concrete and mortar on the dam and repair the security fence where it is broken.
- Commission an underwater inspection of the toe area of the dam to determine if the dam is being undercut by erosion.

June 12, 2024, Dive Inspection by Commercial Divers, Inc.

The following observations were included in the inspection report.

- Concrete on the upstream east side of the dam is in generally good condition, with some spalling at the water line.
- The hardware bolts near the fishway show deterioration. Concrete in the upstream area of the fishway is in good condition.
- The wooden gate is in good condition. Some brush and branches are found under and around the gate area. There is a small leak on the bottom right of the gate. The hardware and wooden seal are in fair to good condition.
- The concrete pad upstream of the gate is in good condition, but there is debris built up in this area.
- The dam and spillway deck are in fair condition. There is some spalling at the water line.
- Undermining was found along the toe of the fishway spillway. The report states that grout bags and riprap were previously added to support and protect the fishway.
- Undermining was found along the downstream footing of the intake section.

The following recommendations were included in the inspection report.

- Repair concrete in areas prone to freeze-thaw.
- Install new self-taping screws on the fishway hardware.
- Use bark mulch to seal the gate to slow leakage.
- Install a rubber seal at the bottom of the gate.
- Address the undermining along the downstream toe of the fishway and screen tank.

Site Inspection

On Friday, June 27, 2025, GEI performed site visits at Toddy Pond Dam and Alamoosook Dam. The principal participants at the site visits included:

- Marc Chmura, P.E. – GEI Consultants, Inc.
- Ali Brady, E.I. – GEI Consultants, Inc.
- Wesley Shute – former dam operator
- Justin – current dam operator
- Gina Bushong – Orland Select Board
- Russ Pierce
- Kat Joyce – Bernstein Shur

At the time of the inspection, the weather was 70°F and sunny.

Photographs taken during the site inspection are included in Appendix B. The water level during the inspection was at about El. 121.1, just below the top of the flashboards. The dam was found to be in FAIR condition. Observations are identified in more detail in the following sections.

Left Abutment

The left abutment was observed from the right upstream and downstream banks, the operator platform, and the left upstream bank. A horizontal crack the length of the abutment was observed on the upstream face of the left abutment approximately 1 foot below the top of the abutment (Photo 5). The concrete on the top of the left abutment was friable. Some efflorescence was observed on the upstream and downstream faces (Photos 5 and 6). Vegetation was observed downstream of the left abutment.

Ogee Spillway

Spalling was observed on the downstream face of the spillway (Photo 10). It appeared that the downstream face may have been resurfaced in the past, but the older concrete below the resurfacing was visible. The flashboards were in place at the time of the inspection (Photo 3). Water was flowing beneath the flashboards but was not overtopping the flashboards. Concrete loss was observed on the right downstream face of the spillway, approximately 6 inches above the tailwater elevation (Photo 9). What appeared to be a vertical construction joint was observed on the downstream face of the spillway. The gate operator stated that the flashboards are put in place for the purpose of maintaining the residents' preferred level of the lake. The flashboards are typically removed in October, though they are not necessarily installed every year. Wes Shute reported having seen water flowing over the intake structure during a previous flood event. The flashboards were in place at the time of that flood event but did not trip (i.e., flashboards reportedly did not trip when reservoir rose above El. 25). Wes reported having never witnessed the flashboards trip.

Gate, Intake, and Fishway Structures

Concrete loss was observed on the gate structure left downstream training wall approximately 1 to 2 feet above the tailwater elevation (Photo 4). It appeared that the concrete above this location was poured more recently than the bottom of the training wall. The concrete at the bottom of the training wall appeared to be in similar condition to the concrete on the downstream face of the spillway. A horizontal crack the length of the left downstream training wall was observed at this contact of old and newer concrete. Efflorescence was observed on the inner face of the downstream training wall (Photo 9). The gate is operated with a handheld battery-operated drill. A Sharpie mark on the gate lets the operator know when the gate is fully closed. The gate was operated at the time of the inspection. The gate was opened several inches during the inspection using the battery powered hand drill. No issues with gate operation were noted during the inspection. The gate components and gears were reported to have been recently greased. Rust was observed on the gate mechanism on the operator platform (Photo 21). Before the inspection, the gate was reportedly last opened approximately 4.5 feet about 2 months before the date of the inspection and closed about 1 month before the date of the inspection.

Efflorescence was observed on the downstream face of the intake structure (Photo 8). A crack approximately 4 feet long was observed on top of the concrete immediately to the left of the fishway intake (Photos 15, 19, and 20). The three intake inlets were not visible at the time of the inspection. Two

rows of steel hatches are located on the top of the intake structure. The upstream-most row of hatches house screens to keep debris from entering the intake pipe. An old, unused screen was located on top of the intake structure at the time of the inspection. The center hatch in the downstream-most row of hatches was opened at the time of the inspection. Standing water was observed beneath the hatch (Photo 16). The intake pipe is reported to be 3 feet in diameter. The intake pipe was reported to have been visible from where it left the intake structure and where it entered the left fishway wall to then run below the fishway passage, but the pipe has since been encased in concrete (Photo 8). The pipe runs to the pumphouse located downstream (Photo 22), where there is a valve. There is no knowledge of a seal on the intake pipe except for this valve. A steel gantry stands over the downstream-most row of hatches. The gantry exhibited rust but showed no significant section loss (Photo 17). An overhead wire connects to the gantry. An overhead light is attached to the right side of the gantry.

Some spalling and efflorescence were observed on the concrete of the fishway. Previous concrete repairs were evident (Photo 11). Neither Wes Shute nor the gate operator knew when the concrete repairs to the fishway were completed. The baffles appeared to be in good condition. Additional wooden boards can be put in the intake of the fishway if the flow in the fishway begins to splash over the sides. The chain link fence to the right of the fishway was broken (Photo 7). The fishway is reportedly used by alewives. A steel gantry stands over the intake to the fishway (Photos 7 and 17). The gantry exhibited rust but showed no significant section loss.

The access walkway from the right abutment over the fishway to the intake appeared in fair condition (Photo 13). Concrete loss was observed on the left side of the right abutment where the railing of the access walkway and components of the fishway inlet connect to the concrete (Photo 18). At the connection of the access walkway railing to the intake structure, two screws appear to have a minimal distance to the edge of the concrete, and one screw is missing (Photo 19).

Right Abutment

Efflorescence was observed on the upstream and downstream faces of the right abutment (Photos 1, 12, 13 and 14). Spalling was observed on the top of the right abutment. Concrete loss was observed on the left side of the right abutment where the railing of the access walkway and components of the fishway inlet connect to the concrete. Vegetation was observed downstream of the right abutment.

Conclusions and Recommendations

In general, we did not observe immediate dam safety concerns at the dam, but there is a lack of engineering analyses and studies to evaluate the stability and hydraulic capacity of the dam. Repairs are needed to address deferred maintenance deficiencies, and engineering studies are required to evaluate and upgrade the dam to meet modern dam safety standards. Detailed conclusions and recommendations are presented below.

Conclusions

- The concrete structures have significant concrete deterioration and spalling, which is a maintenance concern and should be repaired.
- Gates and operators need annual maintenance to lubricate the gate and check the hoist system to keep it in good working condition.
- Preliminary hydrologic and hydraulic estimates performed by Tony Fletcher of MEMA as part of the 2021 inspection indicates that the dam is not capable of passing the 50-year storm. For high hazard dams, a typical inflow design storm requirement is for the dam to be able to safely pass the ½ Probable Maximum Flood (PMF), which would likely require significantly more discharge capacity than is currently available.
- Previous inspections have noted the possibility of ASR in the concrete. However, based on our observations, ASR did not seem to be a significant concern at the structure.
- Previous dive inspections have noted areas of significant scour.
- The crack in the left non-overflow section (Fletcher, Tony, 2021a) is at approximately the elevation of the top of the boards, so there is no associated hazard at normal pool. However, the installation of steel dowels across the crack is a prudent measure to improve stability under flood loading conditions.

Recommendations and Preliminary Cost Estimates

We have provided recommendations to address:

- Maintenance and higher priority considerations (short-term recommendations).
- Engineering studies and field investigations (intermediate recommendations).
- Major dam upgrades to meet modern day safety standards (long-term recommendations).

Short Term Recommendations (1 to 2 years)

- Cut and maintain vegetation within 15 feet of the extents of the dam. Grass should be mowed, and brush on the upstream slopes should be removed. Trees should be cut about 1 foot above the ground surface, and the stumps coated with a sealant to slow decay. Stumps should not be removed as part of this effort. Stump removal is a greater effort, which includes lowering the reservoir, excavating to remove stumps and large roots, properly backfilling, and compacting the excavation, and placing topsoil, seed, and mulch. Stump removal should be performed as part of a larger rehabilitation to save costs.
- Install steel dowels across the identified crack in the left non-overflow section.
- Perform concrete repair and maintenance, which could include grouting cracks or chipping/cleaning spalled areas and patching concrete. Contract with a commercial diver to perform field repairs of any undermined areas of the spillway using grout bags or tremie grout. We recommend that a technical specification and engineering repair drawings be prepared for contractor bidding purposes. We can provide the bid package for an additional cost.

- Inspect and maintain sluice gate and gate components at least annually.
- Operators should perform periodic inspections of the dam to look for changing conditions – including continued concrete deterioration, cracking, rotating of concrete walls, seepage, sloughing, and sinkholes. Special inspections should also be performed after significant flood events or felt earthquakes at the site. Changing conditions should be brought to attention of the dam owner and engineer for dam safety considerations.

Intermediate Recommendations (1 to 5 years)

- Perform an inflow design flood study to estimate the appropriate inflow design flood and hazard classification. We estimate this study would be approximately $50,000 (in 2025 dollars) based on recent experience with other projects. However, if this analysis is performed in conjunction with an inflow design flood study for Toddy Pond Dam, there would be a cost savings in performing the two studies at the same time.
- Perform engineering analyses for stability of the concrete structures. This would likely include the following components. The estimated cost would be approximately $75,000 to $100,000 based on similar projects.
    - Perform a topographic survey.
    - Perform an upstream and downstream underwater dam inspection.
    - Perform concrete cores to confirm the condition of the gravity structures and test for compressive strength.
    - Perform structural stability calculations for the spillway, intake, and retaining walls.
- After the engineering analyses described above are completed, perform a feasibility study for repair or replacement of the dam structure. The feasibility study will inform you of the capital needed for completion of the long-term recommendations. The budget cost for the feasibility study is $75,000.

Long Term Recommendations (5 to 10 years)

Develop a capital expenditure plan to evaluate upgrades to the dam and perform engineering design for the upgrades. This would likely include the following upgrades, but would be dependent on the results of the engineering studies performed for the intermediate recommendations:

- Increase the hydraulic capacity of the dam based on the inflow design flood study. This would likely involve modification of the existing spillway.
- Perform deliberate concrete repairs to any concrete structures not repaired or replaced as part of spillway capacity improvements.
- Engineered repair of scour holes.

It is not possible to estimate the cost of dam upgrades at this time because the engineering evaluations have not been completed. We have included Table 1 below with a comparison of recent dam

rehabilitation projects in the region with a brief scope of work to inform the NWC of potential construction costs.

Comparable Dam Construction Costs

Based on actual bids for recent similarly sized projects dam rehabilitation and replacement projects that we've designed in the region, we have prepared the table below with estimated construction costs (not including engineering design) in 2025 dollars. This information is presented for informational purposes and does not indicate the cost of potential future dam repair or replacement costs for Toddy Pond and Alamoosook Dams. Actual costs will depend on the upgrades required, material costs, the construction market at the time the construction takes place, and inflation from 2025 dollars to future dollars.

Table 1. Comparable Dam Construction Costs (2025 dollars)

Site	Location	Scope	Estimated Construction Cost
Dam A	Maine	Dam Repair: Concrete repairs, lowered left and right ogee sills, retaining wall replacement, new gate structure and gate, embankment filtered seepage collection system, sheet pile cutoff wall, partial concrete apron resurfacing	$1.5M
Dam B	Maine	Dam Repair: Flattened embankment downstream slope, constructed filtered seepage collection system, riprap berm	$1.0M
Dam C	New Hampshire	Dam Replacement: New spillway structure and embankment, access road improvements and new access road bridge	$2.7M
Dam D	Massachusetts	Dam Replacement: New concrete dam with masonry façade	$1.5M
Dam E	Maine	Dam Repair: Obermeyer gate construction, concrete improvements, gate house	$0.7M

Summary of Estimated Costs

Based on site observations, conclusions, recommendations, and comparable construction estimates, we offer the following estimates for each dam.

- A review of Haley Ward's CAPEX Dam Budget indicates that short-term operation, maintenance and repair costs are likely appropriate (Haley Ward, Inc., 2025b) and (Haley Ward, Inc., 2025a).
- The costs for immediate repairs (first 2 years) of approximately $150,000 to $200,000 per dam is likely appropriate. This does not include routine O&M costs.
- The engineering studies and field investigations of about $150,000 in year 2026 (per Haley Ward), would likely be spread out over 2 to 3 years (intermediate recommendations) along with the additional feasibility study estimated at about $75,000. Operations and Maintenance are ongoing costs that will additionally be needed each year (approximately $60,000 to $70,000 per year based on Haley Wards estimate).

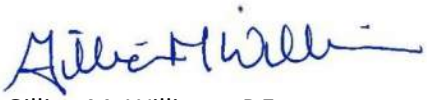
- Significant upgrades to the dams will likely be needed beyond the initial 5-year plan to increase hydraulic capacity to adequately pass the inflow design flood. Engineering design and construction costs are expected to be higher than estimated by Haley Ward in the Contingent CAPEX; however, these are future costs that would occur in 5 to 10 years in the future. Refer to our discussion of comparable dam construction costs indicating an order of magnitude range of about $1M to $3M per dam.

Closing

We appreciate the opportunity to work with you on this project. If you have any questions, please feel free to contact Gillian at 207.797.8920 (gwilliams@geiconsultants.com) or Charles Grant at 781.721.4067 (cgrant@geiconsultants.com).

Sincerely,

GEI CONSULTANTS, INC.



Gillian M. Williams, P.E.
Senior Geotechnical Engineer

Charles B. Grant, P.E., S.E. (MA)
Senior Structural Engineer

Appendices

Appendix A	Toddy Pond Dam Inspection Photos
Appendix B	Alamoosook Dam Inspection Photos

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Appendix A Toddy Pond Dam Inspection Photos

Inspection Photos – Toddy Pond Dam

Orland, Maine

Inspection Date: June 27, 2025

Inspection Photos – Toddy Pond Dam
Orland, Maine
Inspection Date: June 27, 2025

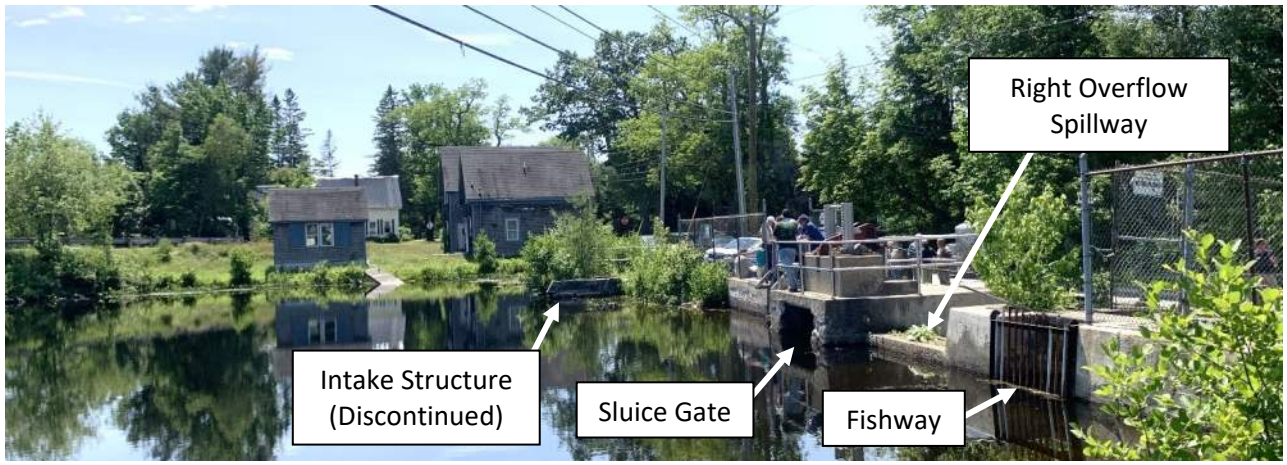

Photo No. 1 – View of dam from right upstream shore, looking left/downstream.


Photo No. 2 – View from discontinued intake structure, looking right. Note vegetation.

Photo No. 3 – Close up view from right upstream shore, looking left/downstream. Note concrete loss on gate structure and left embankment upstream retaining wall. Note the difference in the height of the spillway crest above the headwater of the right overflow spillway (pictured here) and the left overflow spillway (pictured in the following photo).

Photo No. 4 – Close up view from discontinued intake structure, looking right. Note concrete loss on the gate structure. Note the difference in the height of the spillway crest above the headwater of the right overflow spillway (pictured in the previos photo) and the left overflow spillway (pictured here).

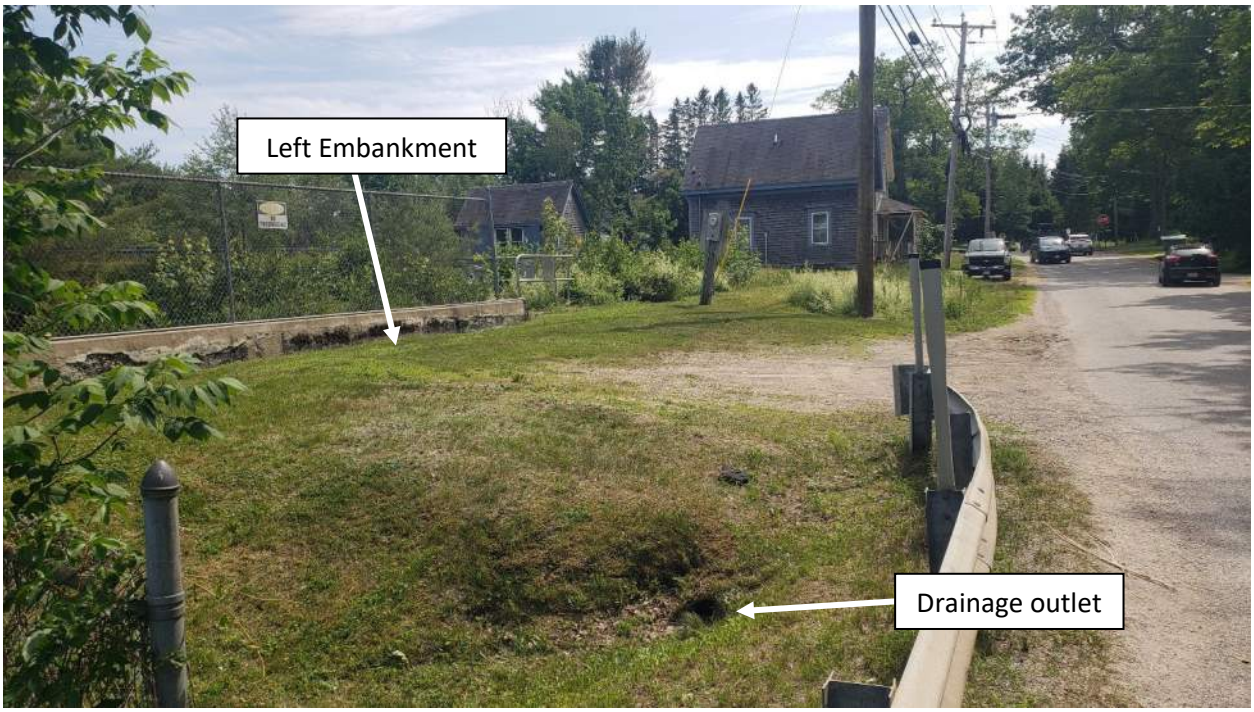

Photo No. 5 – View of left embankment and abutment from Hatchery Road bridge, looking left/upstream.

Photo No. 6 – Downstream side of left embankment (downstream of roadway), looking right. Note vegetation and large trees.

Photo No. 7 – View of dam from Hatchery Road bridge, looking upstream while the gate was opened. Note the debris and vegetation on the spillway aprons.

Photo No. 8 – View of the gate structure/operator platform from Hatchery Road bridge, looking upstream. Note the deflection of the concrete slab.

Photo No. 9 – View of dam from Hatchery Road bridge, looking upstream while the gate was opened. Note concrete loss. Plywood has been installed on the inside walls of the gate structure.

Photo No. 10 – Close up view of gate structure from the left embankment, looking right/upstream while the gate was opened. Note concrete loss.

Photo No. 11 – View of dam from Hatchery Road bridge, looking upstream while the gate was opened. Note concrete loss on the right training wall and apron.

Photo No. 12 – View of discontinued intake structure, looking upstream. Note vegetation.

Photo No. 13 – View from left downstream shore, looking upstream toward the fishway outlet and Hatchery Road bridge. Note concrete loss and vegetation on the embankment.

Photo No. 14 – View from left downstream shore, looking upstream toward the Hatchery Road bridge. Note concrete cracking and vegetation on the embankment.

Photo No. 15 – View from right upstream shore, looking downstream toward Hatchery Road bridge. Note tree growth.

Photo No. 16 – View of top of fishway, looking downstream. Note debris and evidence of concrete repair.

Photo No. 17 – View of top of fishway, looking left/down.

Photo No. 18 – Close up view of top of fishway, looking left/downstream.

Photo No. 19 – View of top of fishway, looking upstream.

Photo No. 20 – View from top of gate looking downstream toward Hatchery Road bridge. Note cracking and concrete loss.

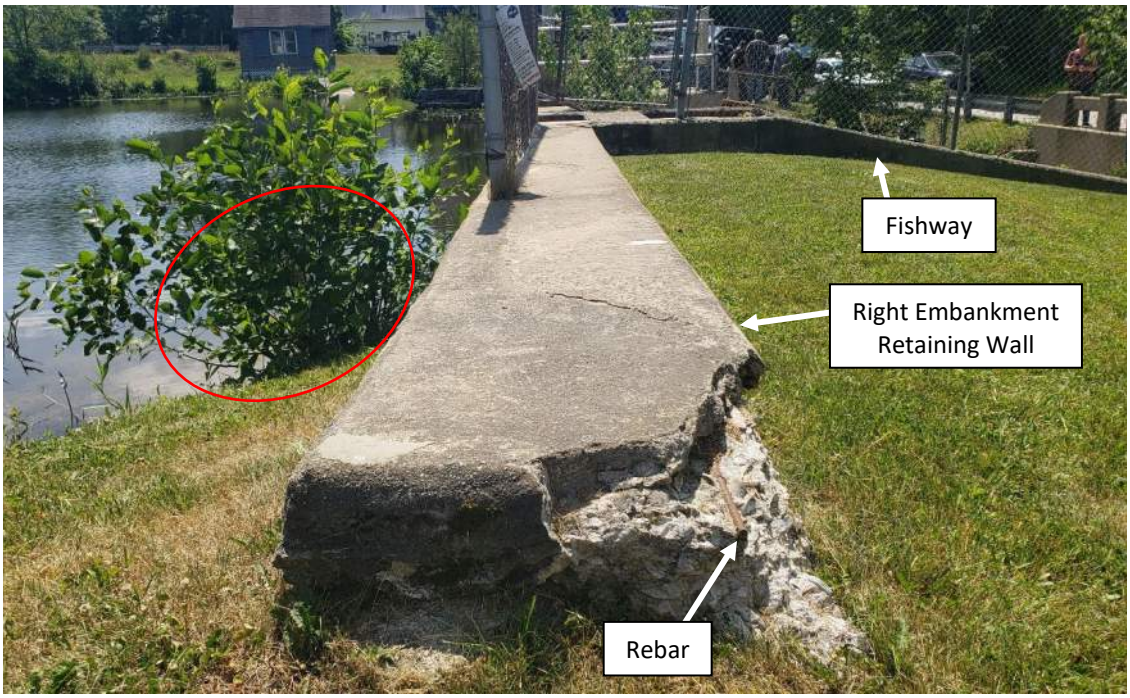

Photo No. 21 – View from right abutment, looking left. Note upstream vegetation and concrete loss.

Photo No. 22 – View of right wall of fishway from right embankment, looking left. Note cracking.

Photo No. 23 – View of right spillway and apron from top of gate, looking down. Note seepage.

Photo No. 24 – View of left spillway and apron from top of gate, looking left/down.

Photo No. 25 – View of gate mechanism from operator platform, looking right.

Appendix B Alamoosook Dam Inspection Photos

Inspection Photos – Alamoosook Lake Dam

Orland, Maine

Inspection Date: June 27, 2025

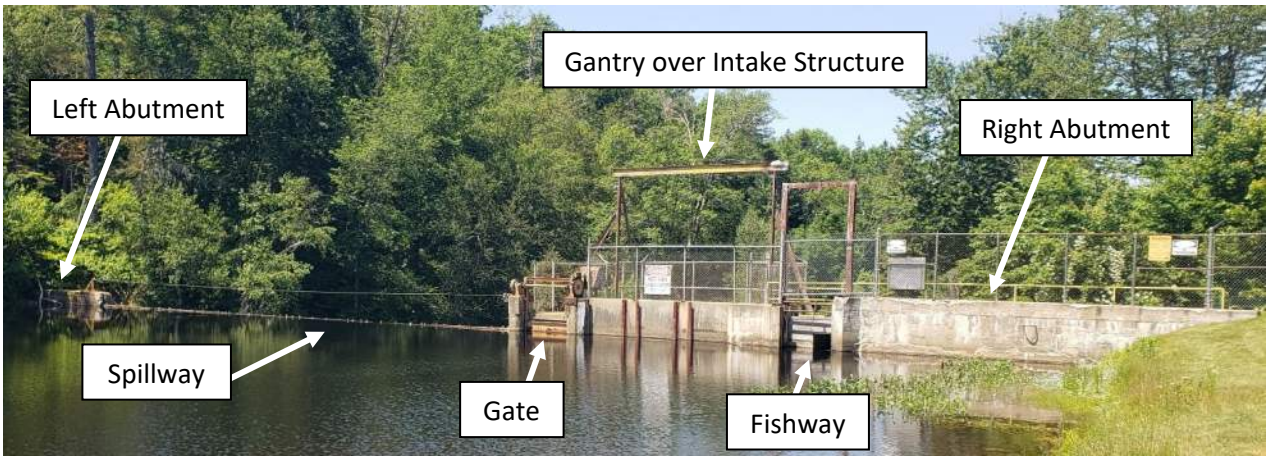

Photo No. 1 – View of dam from right upstream shore, looking downstream.

Photo No. 2 – View of impoundment upstream of Alamoosook Lake Dam from the right shore, looking upstream.

Photo No. 3 – View of dam from left upstream shore, looking right.

Photo No. 4 – View from left upstream shore, looking right. Note cracking and concrete loss on gate pier.

Photo No. 5 – View of left abutment from left upstream bank.

Photo No. 6 – View looking down at left abutment from top of left abutment.

Photo No. 7 – View of fishway and intake structure from right downstream shore, looking upstream. Note efflorescence on the intake structure, repaired concrete on the fishway, and the broken chain link fence.

Photo No. 8 – View of fishway, intake structure, gate outlet, and spillway from right downstream shore, looking upstream. Note efflorescence on the intake structure, concrete loss on the gate pier, and the broken chain link fence.

Photo No. 9 – View of gate outlet and spillway from right downstream shore, looking upstream. Note deterioration at concrete lift joint (red arrow).

Photo No. 10 – Downstream face of spillway, view looking upstream. Photo taken 6/25/2025.

Photo No. 11 – View of fishway from operator platform. Evidence of prior concrete repairs visible. Some concrete spalling.

Photo No. 12 – View of right abutment from upstream right bank. Note efflorescence and spalling.

Photo No. 13 – View of access walkway, railing, and right abutment from the top of the intake structure, looking right. Note efflorescence and spalling.

Photo No. 14 – View of the right abutment, looking down over the railing of the access walkway. Note efflorescence.

Photo No. 15 – View of operator platform/top of intake structure from access walkway, looking left. Note cracking.

Photo No. 16 – View of open center hatch on top of intake structure, looking right. Old unused screen visible downstream of open hatch. Standing water was visible beneath the hatch.

Photo No. 17 – Views of the gantries over the intake structure and fishway intake, looking right.

Photo No. 18 – View of right side of fishway intake. Note concrete loss.

Photo No. 19 – View of left side of fishway intake. Note connection with walkway railing. Two screws appear to have a minimal distance to the edge of the concrete. Note cracking to the left of the fishway intake.

Photo No. 20 – View of concrete between fishway and intake structure from the top of the intake structure, looking upstream. Note cracking.

Photo No. 21 – Views of right and left sides of sluice gate from operator platform, looking upstream.

Photo No. 22 – View of pump house located downstream of the dam, looking upstream.