

Dam Safety Inspection Report

Name: **Shadow Lake**
State ID: **81.02** NID ID: **VT00070**
Hazard Class: **Significant**

Town: **Glover**
Watershed: **Barton River**
Stream: **Barton River-TR**

Inspection Details

Inspection date: 06/28/2023 10:56

Last inspection date: 7/19/2017

Inspection type: Periodic

Weather: Cloudy, Recent Rainfall

Inspected by: Hannah Kuleba, Andrew Sampsell

Others present: Town Selectboard Member

Dam Safety Recommendations

The following recommendations and remedial measures describe the recommended approach to address current deficiencies at the dam. Maintenance level activities can be performed by the Owner, while Studies and Analyses and Remedial Repair Recommendations will require the services of a qualified professional engineer registered in the State of Vermont who is experienced in dam safety engineering design, permitting, and construction. Remedial repairs will likely require obtaining a Dam Order from the Dam Safety Program.

Overall dam condition:

Satisfactory Fair Poor Unsatisfactory Not Rated

**See General Information section at the end of report for further details*

Maintenance level recommendations

<i>General</i>	<ul style="list-style-type: none"> On a regular basis and following the application of unusual or extreme loading conditions, perform monitoring of the dam and its appurtenances. Report any unsafe condition to the Dam Safety Program.
<i>General embankment</i>	<ul style="list-style-type: none"> Establish and maintain vegetation clearing limits a minimum of 15 feet from all portions of the dam. Annually cut and remove grass, weeds, brush, and woody vegetation (but leave stumps) from the dam crest, upstream and downstream slopes, abutments, and downstream areas to near ground surface. Mow/brush the grass surfaces of the embankment at least once to twice annually.

Maintenance level recommendations	
<i>Crest</i>	<ul style="list-style-type: none"> • Cut tall vegetation on dam crest. • A sinkhole was observed in the dam crest during a rapid post flood inspection which took place on 7/18/2023. The inspectors indicated that the sinkhole was located between the gate house and the auxiliary spillway and was approximately 4 feet long and a stick could be inserted 3.5 feet deep. Backfill the sinkhole with compacted granular fill and monitor the sinkhole area and areas upstream and downstream for signs of subsidence. If the sinkhole begins to redevelop or other adverse conditions are observed, contact the Dam Safety Program.
<i>Downstream slope area</i>	<ul style="list-style-type: none"> • Cut tall vegetation on downstream slope. • Regularly monitor seepage, leakage, and/or wet areas for changes in flow, turbidity, or size.
<i>Spillways</i>	<ul style="list-style-type: none"> • Maintain the principal and/or auxiliary spillway free of debris to ensure free-flow conditions. • Cut vegetation in front of, around, and below auxiliary spillway. • Monitor the condition of the auxiliary spillway concrete, and perform minor surficial repairs as needed. • See additional comments under the principal spillway section regarding the principal spillway trash rack and knife gate. • See additional comments under the auxiliary spillway section about previously observed seepage.
<i>Low-level outlets</i>	<ul style="list-style-type: none"> • Periodically monitor and inspect the condition of the stoplogs and take measures to reduce leakage as necessary.
<i>Embankment walls</i>	<ul style="list-style-type: none"> • Cut vegetation in front of the masonry wall.

Studies and analysis	
<i>General</i>	<ul style="list-style-type: none"> • Perform necessary analyses to support either the design of repairs to bring the dam into compliance with current dam safety rules and guidelines, or alternately, dam removal.
<i>Hydrology and hydraulics/hazard classification</i>	<ul style="list-style-type: none"> • Identify alternatives to make the dam hydraulically adequate or capable of safely being overtopped during the Inflow Design Flood.
<i>Emergency Action Planning</i>	<ul style="list-style-type: none"> • Develop an Emergency Action Plan for the dam using the dam safety program's significant hazard potential EAP template, and the inundation mapping produced by the 2022 H&H study.
<i>Operation and maintenance</i>	<ul style="list-style-type: none"> • Develop an Operations and Maintenance Manual for the dam and provide a copy to the Dam Safety Program for record keeping purposes.

Remedial repair recommendations

- Based on the studies and analysis recommended above, repair, rehabilitate, or replace the dam to bring it into compliance with current dam safety rules and guidance. Alternatively, consider pursuing dam removal.

Dam Information

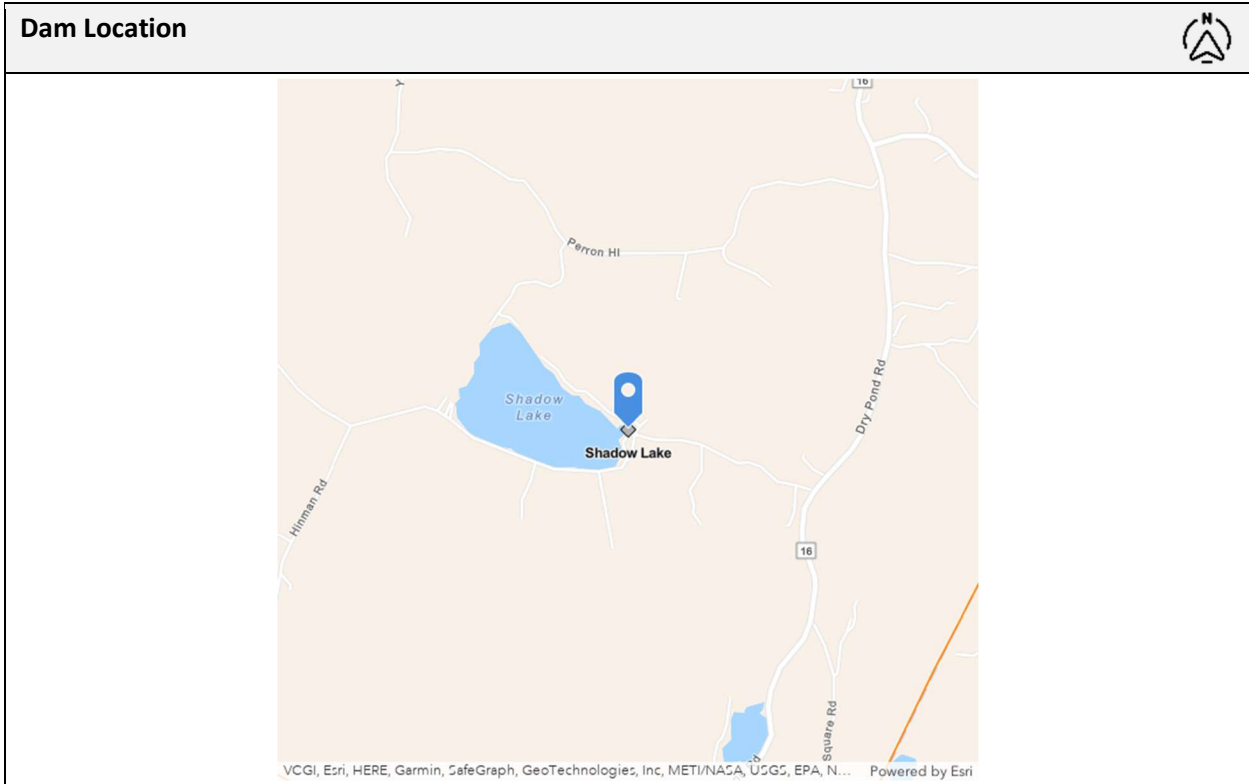
Type: Earth Purpose: Recreation	Status: In Service Height: 12 ft Length: 130 ft	Construction date: 1800s, 1929
Owner/Contact/Operator: Town of Glover <i>email:</i> glovertc@comcast.net <i>phone:</i> (802) 525-6227 <i>Address:</i> 51 Bean Hill Road Glover, VT 05839		
Normal storage: 1709 ac-ft	Max storage: 2,866 ac-ft	Dam has capability to impound more than 500k cubic feet (11.48 ac-ft)
Normal surface area: 220 ac	Drainage area: 5.3 sq mi	Max surface area: 321 ac
Pool elevation during inspection: approx. couple inches of flow over principal spillway stoplogs	Tailwater elevation during inspection: normal, no backwater	Normal pool elevation: 1394.6 (NAVD88 feet)
Dam has not been breached or overtopped.		
Dam does not have public road on crest.	Dam does not have public bridge.	Dam does not have associated dike.
Reservoir shape: Round	Reservoir average depth (ft): Unknown	Reservoir observations:
Shoreline development: <input type="checkbox"/> Undeveloped <input type="checkbox"/> Semi-developed <input checked="" type="checkbox"/> Developed <input type="checkbox"/> Unknown		
Reservoir slopes: <input checked="" type="checkbox"/> Mild <input type="checkbox"/> Moderate <input type="checkbox"/> Steep <input type="checkbox"/> Unknown		
Inspection history: The dam was last inspected in 2017 and was rated in FAIR condition.		
Notes: Increased vegetation growth, encroachment of woody vegetation.		

Access road to dam		
Type: Paved Road	Road name: Shadow Lake Road	Distance from access road to dam: 230 ft
Seasonal access: <input type="checkbox"/> Plowed winter <input type="checkbox"/> Sanded winter <input type="checkbox"/> Maintained in mud season <input checked="" type="checkbox"/> Passable in all weather conditions <input type="checkbox"/> Need high clearance vehicle		
Access of emergency/construction equipment: Fair, requires passing through neighboring properties not owned by the Town of Glover.		
Action required: <input checked="" type="checkbox"/> None <input type="checkbox"/> Monitor <input type="checkbox"/> Maintenance <input type="checkbox"/> Engineer		

Security
Device type(s): The principal spillway gate house is locked.
Action required: <input checked="" type="checkbox"/> None <input type="checkbox"/> Monitor <input type="checkbox"/> Maintenance <input type="checkbox"/> Engineer

Public/Inspection team safety at dam	
Confined space entry required: No	Fall protection required: No
Other safety required: No	Public safety consideration: None
Action required: <input checked="" type="checkbox"/> None <input type="checkbox"/> Monitor <input type="checkbox"/> Maintenance <input type="checkbox"/> Engineer	

Dam Description/Background
Shadow Lake Dam is an earth embankment dam with a principal spillway and auxiliary spillway. The dam is currently classified as a SIGNIFICANT hazard potential. According to file information, the dam is approximately 130 feet long with a reported structural height of 12 feet. The upstream face of the dam consists of a granite block wall with some riprap placed in front of the wall. The crest is about 8 feet wide and surfaced with grass. The downstream slope is earthen and surfaced with grass. The principal spillway is a cast-in-place concrete drop inlet-style spillway with a single stoplog section that controls elevation. A series of timbers in front of the stop logs act as a trash rack. Flow is released through a 36-inch diameter opening with a knife gate located on the upstream face of the opening. The maximum open position of the knife gate partially blocks a small portion of the 36-inch diameter opening. The stop logs and knife gate are housed in a timber gate house building which the owner keeps locked. The auxiliary spillway is a 15 feet wide broad crested weir with a concrete chute. The drainage area of the dam is reportedly 5.3 square miles. Shadow Lake at normal pool is approximately 220 acres and the normal and maximum storage capacity of the dam are approximately 1,708 acre-feet and 2,866 acre-feet, respectively. The dam's original construction dates to the 1800s and the auxiliary spillway was constructed to its current configuration in 1929.



Emergency Action Plan	
EAP on file	EAP date: June 7, 1991 Revised date: January 1, 2015
As the dam is a SIGNIFICANT Hazard potential dam, an up-to-date EAP with dam failure flood hazard inundation map is required.	
Has the EAP been exercised? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

What issues are present with the EAP?	Action
<input type="checkbox"/> None <input checked="" type="checkbox"/> Revisions required <input type="checkbox"/> Not approved <input type="checkbox"/> No plan available <input type="checkbox"/> Inundation study required <input type="checkbox"/> Format out of date <input type="checkbox"/> Under review	<input type="checkbox"/> None <input type="checkbox"/> Monitor <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Engineer
Notes: EAP should be updated using 2022 hydrologic and hydraulic analysis results and mapping. Emergency contacts and procedures should be reviewed and revised as appropriate.	

Operation & Maintenance Manual	
O&M Manual not on file	
Accessibility to outlets or low-level outlet (LLO): Stop logs can be accessed from principal spillway gate house.	Frequency of outlet or LLO discharge: One stop log is removed for winter and replaced in spring.
Frequency of mowing: Annually	Seasonal drawdown? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Amount lowered: 11"
Frequency of dam owner surveillance: Frequent	Owner surveillance during storm events: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Operating problems since last inspection: None reported	History of repairs since last inspection: None reported

What issues are present with the O&M Manual?	Action
<input type="checkbox"/> None <input type="checkbox"/> Revisions required <input type="checkbox"/> Not approved <input checked="" type="checkbox"/> No plan available <input type="checkbox"/> Format out of date <input type="checkbox"/> Under review	<input type="checkbox"/> None <input type="checkbox"/> Monitor <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Engineer

Hazard Potential Classification
<p>Current classification: Significant</p> <p>Current classification appears appropriate, and an inundation map was used to determine the classification. There appears to be no significant changes in land use or habitation since the last inspection.</p>

Hydrologic/Hydraulic Data

Since Shadow Lake Dam is a SIGNIFICANT hazard potential dam, the Inflow Design Flood (IDF) is the 1000-yr event according to federal guidance currently applied in the State of Vermont.

Based on file review, the most recent hydrologic and hydraulic assessment of the dam was performed by Dubois & King, Inc. (D&K) in 2022. As part of this work, D&K confirmed the elevations of key hydraulic features at the dam in NAVD88 in feet:

- Principal Spillway Stoplogs/Normal Pool: El. 1,394.6
- Auxiliary Spillway Weir: El. 1,396.2
- Dam Crest: El. 1,399.8

The hydrologic and hydraulic analyses by D&K provided the following results:

Storm Event	Precip. (in.)	Inflow (cfs)	Outflow (cfs)	Attenuation of Peak Inflow (%)	Peak WS El.	Freeboard (+) or Overtopping (-) (feet)
10-yr	3.55	1,983	44	97.8	1,397.0	+2.8
50-yr	4.82	2,875	117	95.9	1,397.9	+1.9
100-Year	5.40	3,272	155	95.3	1,398.3	+1.5
1000-yr	7.92	4,728	343	92.7	1,400.0	-0.2
PMF	26.0	11,631	11,163	4.0	1,407.8	-8.0

Based on the above results, the dam has approximately 5.2 feet of freeboard to the lowest portion of the dam crest under normal pool conditions, which exceeds the lower allowable freeboard threshold (3 feet) according to State requirements.

Based on the available analysis, it appears the dam has adequate freeboard during the 100-year storm but will overtop during the 1000-yr event. Since the dam cannot safely pass the IDF while maintaining 1.5 feet of freeboard in accordance with State requirements, the dam is considered hydraulically inadequate.

Upstream Slope

Not applicable, see upstream wall section below.

Crest

Length: 130 ft

Width: 8 ft

Freeboard:

Principal spillway to dam crest: 5.2 ft

Auxiliary spillway to dam crest: 3.6 ft

Additional comments: none

Crest issues	Action
<p>Other vegetation Description: Tall grass Quantity: Dense Location: Left End</p>	<p><input type="checkbox"/> None <input type="checkbox"/> Monitor <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Engineer</p>
<p>Additional comments: Vegetation to the left of the auxiliary spillway is too tall and needs to be cut.</p>	
<p>Sinkhole Description: Approximately 4 feet long, and max 3.5 feet deep Location: Crest, between gate house and auxiliary spillway</p>	<p><input type="checkbox"/> None <input checked="" type="checkbox"/> Monitor <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Engineer</p>
<p>Additional comments: A sinkhole was observed in the dam crest during a rapid post flood inspection which took place on 7/18/2023. The rapid inspectors indicated that the sinkhole was located between the gate house and the auxiliary spillway and was approximately 4 feet long and a stick could be inserted 3.5 feet deep.</p> <p>Backfill with compacted granular fill and monitor the sinkhole area and areas upstream and downstream for signs of subsidence. If the sinkhole begins to redevelop or other adverse conditions are observed, contact the Dam Safety Program.</p>	

Crest images



This photo was taken on 7/18/2023 as part of the rapid inspection program (sinkhole).



Downstream Slope
<p>General slope inclination: 3H:1V (slopes are within generally accepted stable inclinations). Downstream slope appears stable based on visual observation under current loading conditions.</p>
<p>Additional comments: none</p>

Downstream slope protections	Action
<p>Vegetation Condition:</p> <p> <input type="checkbox"/> Adequate <input type="checkbox"/> Bare <input checked="" type="checkbox"/> Too tall <input type="checkbox"/> Improper <input type="checkbox"/> Sparse <input type="checkbox"/> Too short </p> <p>Comments: Vegetation prevented a thorough inspection of the downstream slope. The previous 2017 periodic inspection observed seepage and iron staining near the right side (looking downstream) toe of the dam.</p>	<p> <input type="checkbox"/> None <input type="checkbox"/> Monitor <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Engineer </p>

Downstream slope issues	Action
<p>No downstream slope issues were observed during the inspection.</p>	<p>None</p>

Seepage Collection Systems	Number
<p>No seepage collection systems were observed during the inspection.</p>	<p>None</p>

Downstream slope images



Instrumentation

No instrumentation found.

Principal Spillway

Spillway type: Gate house, drop inlet, stop logs. **Primary material:** Concrete - Rectangular

Spillway location: Near right abutment **Gate:** Knife gate

Water level measured against principal spillway crest: approximately 2-inches above stop log crest **Erosion control structures:** Drop sill, riprap

Spillway components:

- | | | |
|--|---|---|
| <input type="checkbox"/> Anti-vortex plate | <input type="checkbox"/> Filter Diaphragm | <input type="checkbox"/> Training Walls |
| <input type="checkbox"/> Flashboard | <input checked="" type="checkbox"/> Trashrack | <input type="checkbox"/> Other: |

Additional comments: A timber trash rack sits in front of the principal spillway stop logs to prevent debris from clogging the spillway. The limited spacing in between the vertical bars results in head loss/flow restriction as indicated in the 2022 H&H study. While the purpose of the trash rack is to limit the potential for debris to get into and clog the spillway, it is recommended that the owner test an alternative debris rack configuration or remove some of the vertical bars to reduce the head loss. A dam order (permit) would not be required to perform this work.

The 2022 H&H study also notes that the slide gate partially blocks the outlet of the principal spillway gate house even with gate stem cranked fully open. This does not appear to influence normal flow conditions, but it may limit outflows under high flow events.

It is the Departments understanding that the Owner periodically closes this gate to equalize water pressure on the stop logs for installation/removal/maintenance. Elimination of this gate is not recommended since it serves an important operation and maintenance function, but the Owner should investigate why the gate does not fully open, and whether maintenance level modifications can be made to fix this issue, or alternatively pursue replacement.

There is no standalone low-level-outlet, removal of the principal spillway stop logs would allow for a partial drawdown of the impoundment. The stop logs could not be thoroughly inspected. Observable portions appeared to be in fair condition.

Principal spillway issues	Action
<p>Trash rack Type: Timber Opening size: Too Small Condition:</p> <p> <input checked="" type="checkbox"/> Good <input type="checkbox"/> Collapsed <input type="checkbox"/> Missing sections <input type="checkbox"/> Broken bars <input type="checkbox"/> Rusted </p>	<p> <input type="checkbox"/> None <input type="checkbox"/> Monitor <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Engineer </p>
<p>Slide Gate Type: Metal, Gate Stem, Handwheel Opening size: Too Small Condition:</p> <p> <input checked="" type="checkbox"/> Good <input type="checkbox"/> Leakage <input type="checkbox"/> Missing Sections <input type="checkbox"/> Broken <input type="checkbox"/> Rusted </p>	<p> <input type="checkbox"/> None <input type="checkbox"/> Monitor <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Engineer </p>

Principal spillway drains	Number
No drains were observed during inspection.	None



Principal spillway images



Principal spillway images



Auxiliary Spillway	
Spillway type: Weir	Primary material: Concrete Weir: Broad-Crested
Spillway location: Left abutment	
Water level measured against principal auxiliary crest: Not measured	Erosion control structures: Riprap
Spillway components:	
<input type="checkbox"/> Anti-vortex plate	<input type="checkbox"/> Filter Diaphragm <input checked="" type="checkbox"/> Training Walls
<input type="checkbox"/> Flashboard	<input type="checkbox"/> Trashrack <input type="checkbox"/> Other:
<p>Additional comments: On April 28, 2023, approximately 20 gallons per minute of seepage was previously observed near the left (looking downstream) bottom corner of the auxiliary spillway. At the time of this inspection the pool elevation was measured to be 3-inches below the dam’s auxiliary spillway crest (approximately 16 inches above normal pool).</p> <p>At the time of this June 28, 2023 inspection above-mentioned seepage was not observed. The water level at the time of this inspection was observed approximately 2-inches above normal pool. Some water was pooled below the base of the auxiliary spillway. It had recently rained, and it was unclear if this water was from seepage or not. The pooled water did not appear to be actively flowing.</p> <p>While the seepage path potentially could have self-healed, it should be noted that the pool elevation during the April 28, 2023 site visit was approximately 14 inches higher than during this June 28, 2023 inspection.</p> <p>It is recommended that the owner continue to periodically monitor this area for seepage paying special attention to elevated pool conditions and keeping an eye out for any changing conditions. Cutting the tall vegetation will make it easier to monitor for seepage.</p>	

Auxiliary spillway issues	Action
<p>Other Description: Vegetation growth, too tall Location: in front of, below, and beside</p>	<input type="checkbox"/> None <input type="checkbox"/> Monitor <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Engineer
<p>Undermining/Seepage Description: Over the years the channel below the auxiliary spillway has experienced erosion from turbulent flow. The end of the spillway slab has been partially undermined. Voids range from 6 to 18 inches deep. Large stones have been placed along the base of the spillway to help reduce the potential for further erosion to occur, however this is not an engineered design, and it is unclear if this measure will perform satisfactory under the inflow design flood loading condition. This is the same location where seepage unearths the spillway slab has been historically observed.</p> <p>Location: End of spillway, below slab</p>	<input type="checkbox"/> None <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Engineer

Auxiliary spillway issues	Action
<p>Concrete deterioration Description: There are visible signs of wear and deterioration along the entirety of the auxiliary spillway. The concrete has been patched/repared in some places along the training walls. Concrete is in fair condition for its age.</p>	<p> <input type="checkbox"/> None <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Maintenance <input type="checkbox"/> Engineer </p>

Auxiliary Spillway Drains	Number
<p>No drains were observed during inspection.</p>	<p>None</p>



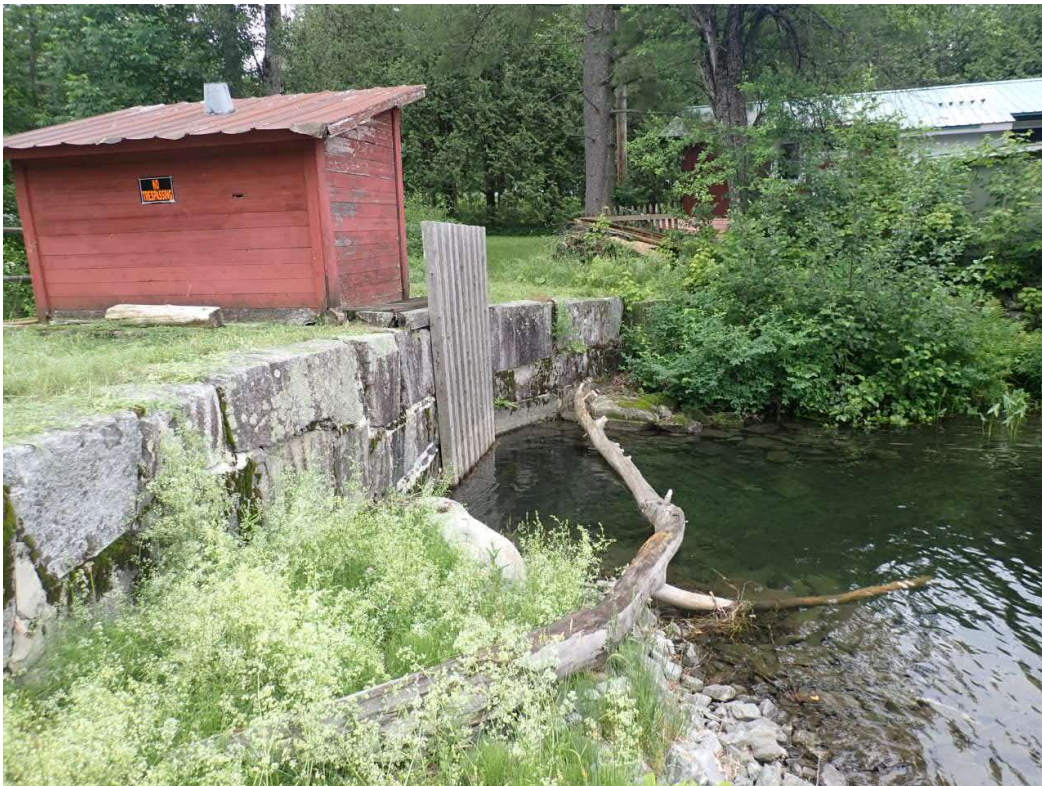
Auxiliary spillway images



Upstream Wall		
Wall type: Stone Masonry Length: 130 ft		
Wall height (exposed): 5.2 ft above normal pool	Horizontal wall alignment: Good	Vertical wall alignment: Good
Unusual wall movement: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Additional comments: Stone/riprap has been placed in front of the wall; tall vegetation is growing on the stone/riprap which prevented thorough inspection.		Surface condition: Fair to Good
Joint condition: Good		Abutment contact condition: Good

Upstream wall issues	Action
Vegetation Condition: <input type="checkbox"/> Adequate <input type="checkbox"/> Bare <input type="checkbox"/> Improper <input type="checkbox"/> Sparse	<input type="checkbox"/> None <input type="checkbox"/> Monitor <input checked="" type="checkbox"/> Too tall <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Too short <input type="checkbox"/> Engineer
Comments: none	

Upstream wall images



Upstream wall images



GENERAL INFORMATION

Website: <https://dec.vermont.gov/water-investment/dam-safety>

The Dam Safety Program conducts periodic safety inspections of non-federal, non-power dams to determine their condition and the extent to which they pose a potential or actual threat to life, property, and the environment. The condition rating reported herein was based on available data and visual inspection. Detailed investigations/analyses were beyond the scope of this report. It should be realized that the reported condition was based on observations of field conditions at the time of inspection, along with data available to the inspection team. The condition of the dam depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam in the future. Only through continued care and inspection can there be any chance that unsafe conditions are detected.

Hazard Potential Classifications:

HIGH: Dams where failure or mis-operation will probably cause loss of human life.

SIGNIFICANT: Dams where failure or mis-operation results in no probable loss of human life but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

LOW: Dams where failure or mis-operation results in no probable loss of human life and low economic and environmental losses.

MINIMAL: A dam that meets the LOW hazard definition, above, but is only capable of impounding less than 500,000 cubic feet.

Condition Ratings:

SATISFACTORY: No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria or tolerable risk guidelines.

FAIR: No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action.

POOR: A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. POOR may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

UNSATISFACTORY: A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

NOT RATED: The dam has not been inspected, is not under state jurisdiction, or has been inspected but, for whatever reason, has not been rated.

Definitions:

Upstream: The side of the dam that borders the impoundment located up gradient of the dam.

Downstream: The side of the dam opposite the upstream side, located down gradient of the dam.

Right: The area to the right when looking in the downstream direction (also known as "river right").

Left: The area to the left when looking in the downstream direction (also known as "river left").

Structural Height-of-Dam: The vertical distance from the lowest point in the stream bed or native ground surface at the downstream toe of the dam to the elevation of the lowest non-overflow section of the dam crest.

Embankment: An artificially constructed feature usually consisting of earth and rock with sloping sides and a flat crest, intended to provide a permanent barrier that impounds or is capable of impounding water.

Dam Crest: The top of the non-overflow portion of the dam.

Abutment: The part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed at the interface with a concrete gravity section.

Normal Pool: The water elevation, reservoir surface area, and reservoir storage capacity that is prevalent at the site or typical under normal, non-storm conditions. Typically, this level is controlled by the principal spillway.

Maximum Pool: The highest water elevation, reservoir surface area, and reservoir storage capacity that could be impounded by the dam, including accumulated sediments, with the water or liquid level at the top of the lowest non-overflow part of the structure or dam crest.

Principal spillway: A structure that maintains normal pool conditions and over which daily non-storm related and flood flows are discharged. Also called a primary or service spillway.

Auxiliary Spillway: The secondary spillway not in use under normal conditions but used when needed to pass flood flows that exceed the capacity of the principal spillway.

Low-level outlet or "LLO": An installed pipe and operable gate or valve typically located in or near the foundation of a dam that can be used to alter water levels, drain the reservoir, or otherwise meet operational or safety needs. Also called a pond drain.

Inflow Design Flood or "IDF": The storm event which the dam is designed and required to safely pass. Dam safety rules under development are considering the following prescriptive IDF's, Low and Minimal = 100-year Storm, Significant = 1,000-year storm, High = PMF. The use of incremental consequence analysis or risk-informed decision making to evaluate the potential of selecting a smaller/site specific IDF is permitted.

Emergency Action Plan (EAP): A written plan that identifies the area that would likely be inundated by the failure of a dam and identifies the actions that should be taken by the Owner to protect life, property, lifelines, and the environment in the event of a dam failure or threatening condition at the dam. The plan is usually implemented in cooperation with the local, regional, and state emergency personnel.

Operation and Maintenance Plan or "O&M": A plan that provides guidelines for the necessary, regular operation and maintenance activities at a dam.

Complete list of definitions from the Vermont Dam Safety Rule:

<https://anrweb.vt.gov/DEC/IronPIG/DownloadFile.aspx?DID=185352&DVID=0>