

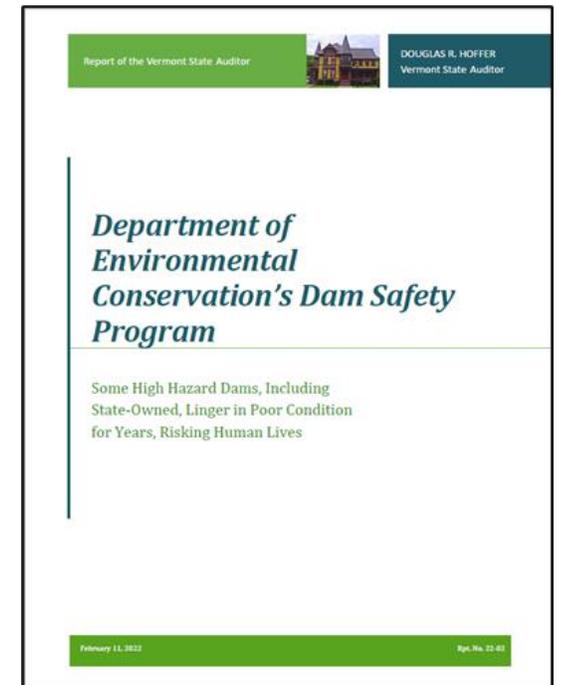
Department of Environmental Conservation's Dam Safety Program

Some High Hazard Dams, Including State-Owned,
Linger in Poor Condition for Years,
Risking Human Lives

Audit Objective

To determine whether DEC required dams in poor condition that have high or significant hazard potential be improved within a specific timeframe, and whether DEC followed-up to ensure that dam improvements were implemented.

Click on picture below to access full report.



What is meant by Hazard Potential?

Dam Hazard Potential Classifications, in effect through August 2020

Hazard Category	Potential Loss of Life	Potential Economic Loss	Inspection Frequency, years
High Hazard	More than a few	Excessive (extensive community, industry, or agricultural.)	1 (Annually)
Significant Hazard	Few (no urban developments, no more than a small number of habitable structures)	Appreciable (notable agricultural, industry, or structures.)	3 - 5
Low Hazard	None expected (no permanent structures for human habitation.)	Minimal (undeveloped to occasional structures or agricultural.)	5 - 10

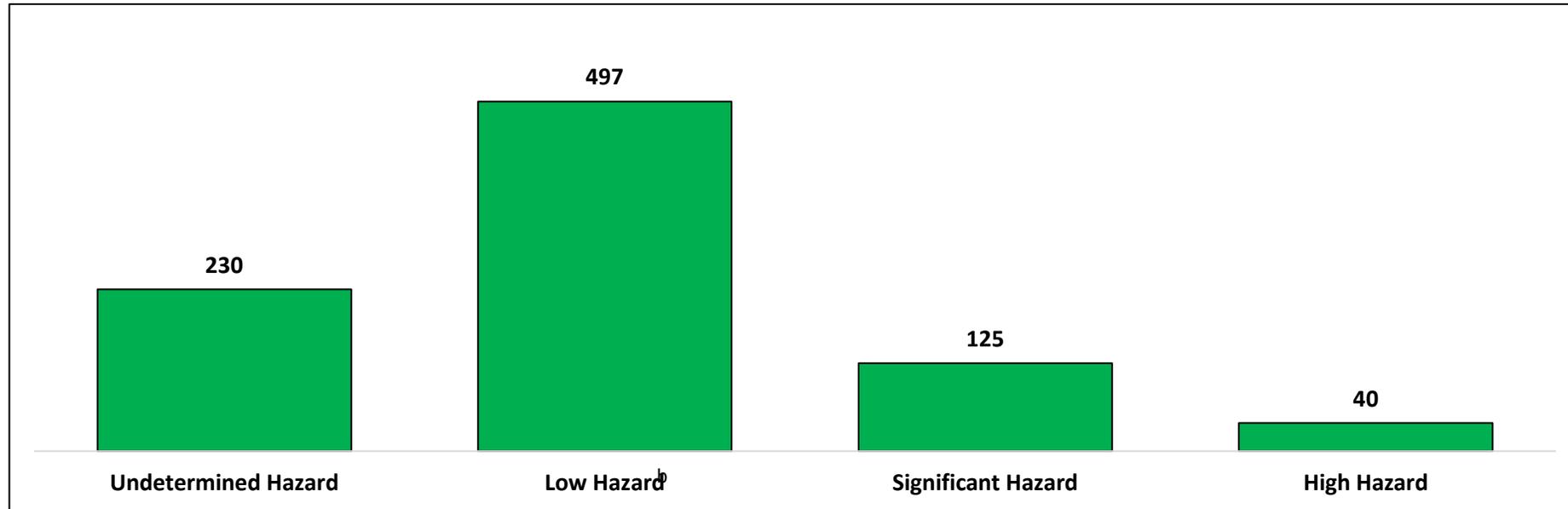
Dam Hazard Potential Classifications, in effect after August 2020

Hazard Category	Potential Loss of Life	Property Losses	Lifeline Losses ^a	Environmental Losses	Inspection Frequency, years
High Hazard	Probable. (one or more)	Not considered.	Not considered.	Not considered.	2
Significant Hazard	None expected.	Major or extensive public and private facilities.	Disruption of essential or critical facilities and access.	Major or extensive mitigation required or impossible to mitigate.	5
Low Hazard	None expected.	Private agricultural lands, equipment and isolated non-occupied buildings, non-major roads.	No disruption of services - repairs are cosmetic or rapidly repairable damage.	Minimal incremental damage.	10
Minimal Hazard ^b	Same as low hazard.	Same as low hazard.	Same as low hazard.	Same as low hazard.	None

^a Lifeline means a structure or service indispensable for maintaining or protecting life, including but not limited to key transportation links such as bridges or highways; power supply lines, potable water connection or supply; or sanitary sewer connections.

^b Minimal dams hold less than 11.48 acre-feet but have the same hazards as low hazard potential dams.

Number of Dams that DEC May be Required to Inspect By Hazard Rating^a



^a The inventory contains incomplete and possibly inaccurate information, and SAO did not perform any work to validate the accuracy of the information in this chart.

^b DEC has not updated their inventory to distinguish minimal from low hazard dams. DEC asserts that it is likely approximately 50 percent of these dams are actually minimal hazard per the new definitions, requiring no periodic inspection.

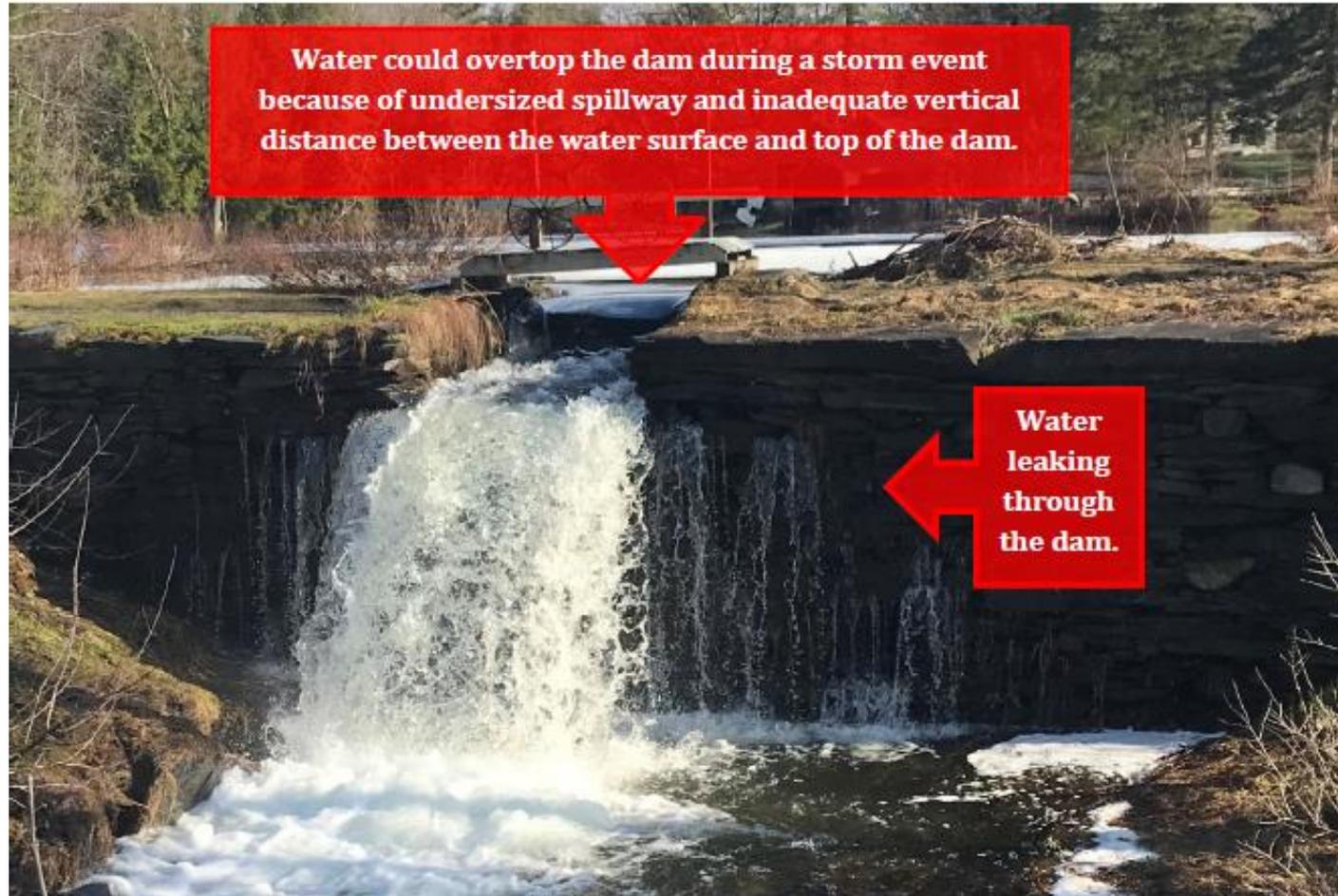
What is meant by Condition?

Dam Condition Ratings Used in the Inspection Reports We Reviewed

Condition rating	Definition
Good	No existing or potential deficiencies recognized except for minor operational and maintenance deficiencies. Safe performance is expected under all loading conditions.
Fair	Significant operational and maintenance deficiencies, no structural deficiencies. Potential deficiencies exist under unusual or extreme loading conditions.
Poor	Significant structural and or operation and maintenance deficiencies are clearly recognized under normal loading conditions.

Images of Dams In Poor Condition

Examples of Deficiencies with Curtis Pond Dam in Calais



Images of Dams In Poor Condition

Degraded Spillway in the Thurman W. Dix Reservoir Dam in Orange



Images of Dams In Poor Condition

Exposed Rebar in the Thurman W. Dix Reservoir Dam in Orange



Minimum Years Known in Poor Condition for Dams Reviewed

Dam Name	Location	Owner Type	Hazard Potential	Earliest Known Year Classified in Poor Condition	Year of Last Inspection	Years Known to Be in Poor Condition ^a
Curtis Pond Dam ^{b c}	Calais	Private	Significant	2001	2019	18
Institute Pond Dam ^b	Lyndon	Private	High	2002	2020	18
Chestnut Hill Reservoir Dam ^{b d}	Brattleboro	Local Government	High	2000	2017	17
Mirror Lake Dam ^b	Calais	Private	Significant	2004	2015	11
East Long Pond Dam ^e	Woodbury	Local Government	High	2011	2020	9
Thurman W. Dix Reservoir Dam	Orange	Local Government	High	2013	2020	7
Lake Sadawga West Dike	Whitingham	State	High	2014	2020	6
Caspian Lake Dam ^e	Greensboro	Local Government	Significant	2011	2017	6
Kent Pond Dam	Killington	State	Significant	2012	2015	3
Gale Meadows Dam	Londonderry	State	Significant	2014	2017	3

^a Until each dam is re-inspected, it is unknown if the dam continues to be in poor condition.

^b These dams may have been in poor condition longer; the earliest inspection report provided by DEC showed the dam in poor condition, but all dams were in service well before 2000.

^c DEC has been unable to determine the legal owner of this dam but their inventory lists the dam owner type as private.

^d DEC inspected this dam in 2021 but has not completed the inspection report. DEC intends to upgrade the condition rating to satisfactory, as it was recently repaired.

^e This dam is owned by the Hardwick Electric Department, which DEC classifies as “local government” in their inventory.

What We Recommended to DEC

1. Adopt rules the Department deems essential, using the emergency rulemaking process if necessary, to compel dam owners, including state dam owners, whose dams are in poor condition to undertake repair work within a specified timeframe and the procedures needed to enforce those rules.
 - Inspection reports contain recommendations, but DEC never specified a timeframe, nor did they require owners to act on recommendations.
2. Establish and implement a time limit for finalizing and providing DEC inspection reports to dam owners.
 - DEC inspected dams in 2019 and 2020 but as of December 2021 they still had not finalized their inspection reports and provided them to the dam owners.
3. Maintain points of contact for state-owned dams. For state-owned dams the DEC determines to be in poor condition, the Commissioner should immediately notify the Agency Secretary of Department Commissioner who is responsible for the dam.
 - DEC reported that they had not always notified state agencies and departments that they had inspected dams and that the inspection reports were available.

What We Recommended to DEC

4. Direct DSP staff to maintain a dam inventory that includes complete, up-to-date, and accurate condition information.
 - DEC does not maintain a complete and accurate repository of dam condition information. Without this, DEC risks being unable to provide correct information to stakeholders or to prioritize which dams need attention.
5. Update the dam inventory to ensure that dams have the correct hazard classification with priority given to dams currently classified as significant hazard potential.
 - The definitions for hazard potential classifications have changed, but DEC has not updated their inventory. It is possible that significant hazard potential dams are high hazard under the new definitions, and therefore would go up to five years before DEC inspects them.
6. Record inspection dates in the inventory as they occur and assess whether dams are being inspected timely.
 - DEC has not updated the dam inventory with dates of inspection; it is unclear how DEC can determine whether they are inspecting dams within the appropriate timeframes.

What We Recommended to DEC

7. Assess the staffing levels of the Dam Safety Program and identify what the appropriate staffing levels should be.
 - The American Society of Civil Engineers recommended an increase in staffing for the Dam Safety Program. DEC acknowledged that the program is understaffed.
8. Develop a process to ensure that requiring dam owners to pay for periodic inspections is done in a fair and consistent manner.
 - Under a recently adopted rule, if DEC is unable to perform a periodic inspection (which are at no cost to the owner), they are authorized to require the dam owner to hire an engineer, at the owner's expense, to perform the inspection. If some dam owners are required to pay for these inspections because DEC does not have enough staff to conduct all inspections, this could potentially raise a fairness issue.
9. Obtain dam condition information annually from the PUC.
 - The PUC is required to annually submit to DEC information on dams that they regulate. DEC did not request dam condition information from the PUC, and therefore DEC's dam inventory is incomplete.

Going Forward

- DEC has requested an additional \$3.5million for FY23 for projects at up to 21 HIGH and SIGNIFICANT Hazard ANR owned dams. Plan to identify potential failure modes and relative risk estimates for each dam, then prioritize projects based on risk estimates to “buy down risk.”
- Unclear what future needs will be until DEC has identified risks for each dam and determined cost to remediate these state-owned dams.
- Unclear how dams outside ANR (AOT, state colleges) will be remediated (8 dams).
- Leaves unspoken how dams in poor condition owned by private owners will be addressed.

Questions?