

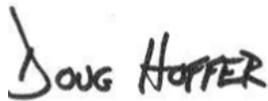
Dear Vermonters,

When we think about public safety, dams may not come to mind, but a dam failure can result in damaged property and loss of life.

In light of the importance of dam safety, I directed my staff to conduct an audit of Vermont's Dam Safety Program which is responsible for regulating and inspecting many of the state's dams to identify whether they pose risks to the public. The staff identified a number of opportunities for improvement, and we made nine recommendations to the Commissioner of the Department of Environmental Conservation (DEC). The full report can be found [here](#). For your convenience I offer the following summary of that report.

I would like to thank the staff at DEC for their cooperation and professionalism during this audit.

Sincerely,



DOUGLAS R. HOFFER  
State Auditor

The mission of the Auditor's Office is to hold State government accountable by evaluating whether taxpayer funds are being used effectively and identifying strategies to eliminate waste, fraud, and abuse.

# Report Summary

In March 1996, the Meadow Pond Dam in Alton, New Hampshire failed, sending a wall of water rushing downhill and nearly washing away a small neighborhood. One person died and the failure caused more than \$8 million in property damages.

The State of Vermont seeks to prevent catastrophes like these through the systematic inventory, inspection, and categorization of dams.

The Dam Safety Program (DSP) within DEC inspects and regulates all Vermont dams except those owned by the federal government and those used to generate electricity. The DSP also manages and operates 14 state-owned dams, including three Winooski River flood control dams deemed to have high hazard potential.<sup>1</sup> A high hazard potential dam is one that has the potential to cause loss of life should it fail. Hazard classifications do not indicate the structural integrity of the dam itself, but rather the probable effects if the dam were to fail. A separate rating assigned to each dam describes the condition of the dam. For example, DEC may rate a dam in poor condition if they determine that the dam has substantial deficiencies.

In 2019, the American Society of Civil Engineers (ASCE) gave Vermont a grade of “C” for dams in their “Report Card for Vermont’s Infrastructure.”<sup>2</sup> The ASCE found a large number of deteriorating dams and concluded that Vermont had been fortunate not to experience a recent dam failure. The report notes that the state needs “more dam safety inspections and improved maintenance” to “properly manage dams in the state and maintain public safety.”

The State Auditor’s Office (SAO) conducted this audit of dam safety with the 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 the dam improvements were implemented.

## What We Found

We reviewed inspection reports for ten dams DEC classified as being in poor condition based on their inspections. These reports contained recommendations to the dam owners listing actions necessary to correct the deficiencies. However, DEC never specified a timeframe by which the dam owner had to act on the recommendations, nor did they require that the dam owners implement the recommendations. Prior to adopting new administrative rules in August 2020,<sup>3</sup> DEC did not have the necessary regulatory authority to enforce the recommendations.

Under the new rules, DEC is required to provide dam owners with a written notification that they must undertake repair work within a specified timeframe or be subject to enforcement. According to

<sup>1</sup> The flood control dams are the (1) East Barre Dam in Barre Town, (2) Waterbury Dam in Waterbury, and (3) Wrightsville Dam in Middlesex. See DSP’s webpage found [here](#) for more information about these and other DEC-owned dams.

<sup>2</sup> The Report Card for Vermont’s Infrastructure can be found [here](#).

<sup>3</sup> [Vermont Dam Safety Rule](#).

a DEC dam safety official, until DEC adopts additional rules that outline timeframes for repairs and enforcement procedures DEC will not dictate timeframes nor undertake enforcement actions against dam owners for not implementing recommendations. DEC is required to have these additional rules adopted by July 2022. However, as of January 26, 2022, DEC had not started formal development of the rules, and therefore it is unlikely that DEC will meet the July 2022 due date for adoption.

While DEC followed-up on recommendations during subsequent inspections, in most cases, the subsequent inspections found that the dam owners had taken little or no action to improve the overall condition of the dam. Based on the information DEC provided to the SAO, **some of the dams in our review have been classified in poor condition by DEC for at least 18 years, as shown in Table 1 below.**

**Table 1: 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 <sup>a</sup>
Curtis Pond Dam <sup>b c</sup>	Calais	Private	Significant	2001	2019	18
Institute Pond Dam <sup>b</sup>	Lyndon	Private	High	2002	2020	18
Chestnut Hill Reservoir Dam <sup>b d</sup>	Brattleboro	Local Government	High	2000	2017	17
Mirror Lake Dam <sup>b</sup>	Calais	Private	Significant	2004	2015	11
East Long Pond Dam <sup>e</sup>	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 <sup>e</sup>	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

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

<sup>b</sup> 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.

<sup>c</sup> DEC has been unable to determine the legal owner of this dam, but their inventory lists the dam owner type as private.

<sup>d</sup> 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.

<sup>e</sup> This dam is owned by the Hardwick Electric Department, which DEC classifies as "local government" in their inventory.

### **Recommendation 1**

*That DEC 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.*

State law requires that DEC provide dam owners with a copy of their inspection reports.<sup>4</sup> However, DEC has yet to provide some dam owners with inspection reports from inspections DEC conducted in 2019 and 2020 because they have not finalized those reports. **Until DEC provides dam owners with inspection reports, in a timely manner, that include timeframes for corrective action and develops procedures to enforce those timeframes, owners may continue to leave dams in poor condition indefinitely, risking property, the environment, and human lives.**

#### **Recommendation 2**

*That DEC establish and implement a time limit for finalizing and providing DEC inspection reports to dam owners.*

DEC also informed us that if they did not have a point of contact for state-owned dams, they filed the report away without notifying the State entity that owns the dam. **Without direct notification that DEC inspected a dam, and that DEC determined the dam to be in poor condition, state agencies and departments cannot be held accountable for failing to undertake repair work. Until repaired, state-owned dams in poor condition will remain in poor condition, placing property, the environment, and human lives at risk and potentially exposing the State to lawsuits should the dam fail.**

#### **Recommendation 3**

*Maintain points of contact for state-owned dams. For state-owned dams DEC determines to be in poor condition, the Commissioner should immediately notify the Agency Secretary or Department Commissioner who is responsible for the dam.*

DEC is responsible for maintaining an inventory of dams in Vermont. DEC created a database to maintain this inventory and record inspection information, including the condition of the dam. However, DEC did not use this database to maintain a complete and accurate repository of dam condition information from their inspections. **DEC stated that recording condition information in their database was not a priority and, therefore, has not been done consistently.**

#### **Recommendation 4**

*Direct DSP staff to maintain a dam inventory that includes complete, up-to-date, and accurate condition information.*

DEC's dam inventory also includes the hazard potential classification of each dam. The hazard potential is based on the potential loss of life or other losses that may occur if the dam were to fail, as shown in Table 2 on the following page, and provides criteria for DEC's inspection frequency.

<sup>4</sup> [10 V.S.A. § 1105\(c\)](#).

**Table 2: Hazard Potential Classification and Inspection Frequency, in Effect After August 2020**

Hazard Category	Probable Loss of Life	Property Losses	Lifeline Losses <sup>a</sup>	Environmental Losses	Inspection Frequency (Years)
High Hazard	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 <sup>b</sup>	Same as low hazard.	Same as low hazard.	Same as low hazard.	Same as low hazard.	None

<sup>a</sup> Lifeline means a structure or service indispensable for maintaining or protecting life, such as bridges or highways; power supply lines, potable water connection or supply; or sanitary sewer connections.

<sup>b</sup> Minimal hazard potential dams hold less than 11.48 acre-feet of water but have the same hazards as low hazard potential dams.

The definitions for the hazard potential classifications changed when DEC adopted administrative rules in 2020.<sup>5</sup> Prior to 2020, the definition for *significant* hazard potential included the potential loss of a few lives and *high* hazard potential was more than a few lives lost. However, DEC has not fully updated their inventory to reflect the hazard potential classifications currently in use. Therefore, it is possible that dams that DEC previously classified as “significant hazard” potential should be considered “high hazard” potential under the new definition.

While it is unknown how many high hazard potential dams are misclassified as significant potential, until DEC updates their inventory these dams may go up to five years before DEC inspects them because of their incorrect hazard potential classification, which would be a violation of rule.

#### **Recommendation 5**

*That DEC update the dam inventory to ensure that dams have the correct hazard classification with priority given to dams currently classified as significant hazard potential.*

During our file review, we identified that DEC had not inspected two significant hazard potential dams (Kent Pond Dam in Killington and Mirror Lake Dam in Calais) within the five-year timeframe as required by their rule. If DEC does not adhere to the inspection frequency, they may miss changes that could lead to dam failure and place the environment, property, and human lives at risk.

We also found that for the past several years, DEC has not been recording the inspection dates in their inventory. From 2017 to 2020, fourteen inspection reports we reviewed were not found in the dam inventory. Until DEC updates the hazard classification of dams in their inventory and records inspection dates, it is unclear how DEC can determine whether they have the appropriate staffing level for their Dam Safety Program and whether they are inspecting dams within the appropriate timeframes.

<sup>5</sup> [Vermont Dam Safety Rule §37-110.](#)

**Recommendation 6**

*That DEC record inspection dates in the inventory as they occur and assess whether dams are being inspected timely.*

**Recommendation 7**

*That DEC assess the staffing levels of the Dam Safety Program and identify what the appropriate staffing levels should be.*

Under the recently adopted rule, if DEC is unable to perform a periodic inspection (for which there is no cost to the dam 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 and others are not because DEC does not have enough staff to conduct all inspections, this could raise a fairness issue.

**Recommendation 8**

*That DEC develop a process to ensure that requiring dam owners to pay for periodic inspections is done in a fair and consistent manner.*

**Other Matters**

The Public Utility Commission (PUC) plays a role similar to DEC with respect to regulating power-generating dams in Vermont. We found the PUC does not use the same hazard potential definitions as DEC nor do they require dams to be inspected as frequently as DEC because the PUC's rules, which went into effect in 1990, have not been updated to match DEC's current rules. As a result, dams under the PUC's jurisdiction that have the potential for loss of human life should they fail may go up to ten years without an inspection, whereas DEC requires these types of dams to be inspected at least every two years. The State Auditor sent a letter to the PUC Chair informing him of this issue. The PUC Chair responded that they would initiate rulemaking now to match the hazard potential definitions and inspection frequencies in their rules with DEC's. The State Auditor's letter and the Chair's full response can be found [here](#).

The PUC is required by statute to keep an inventory of dams and provide that inventory to DEC annually, which the PUC provided. DEC had not asked the PUC to provide condition rating in these reports, though they plan to request it for the most recent inspections. DEC's inventory of dams will continue to be incomplete without condition information.

**Recommendation 9**

*That DEC obtain dam condition information annually from the PUC.*