

Department of Environmental Conservation
Dam Safety Program
Draft Administrative Rules



Waterbury Dam

Dam Safety Workshop
November 5, 2019

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VTDEC Dam Safety Program



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Presentation Overview

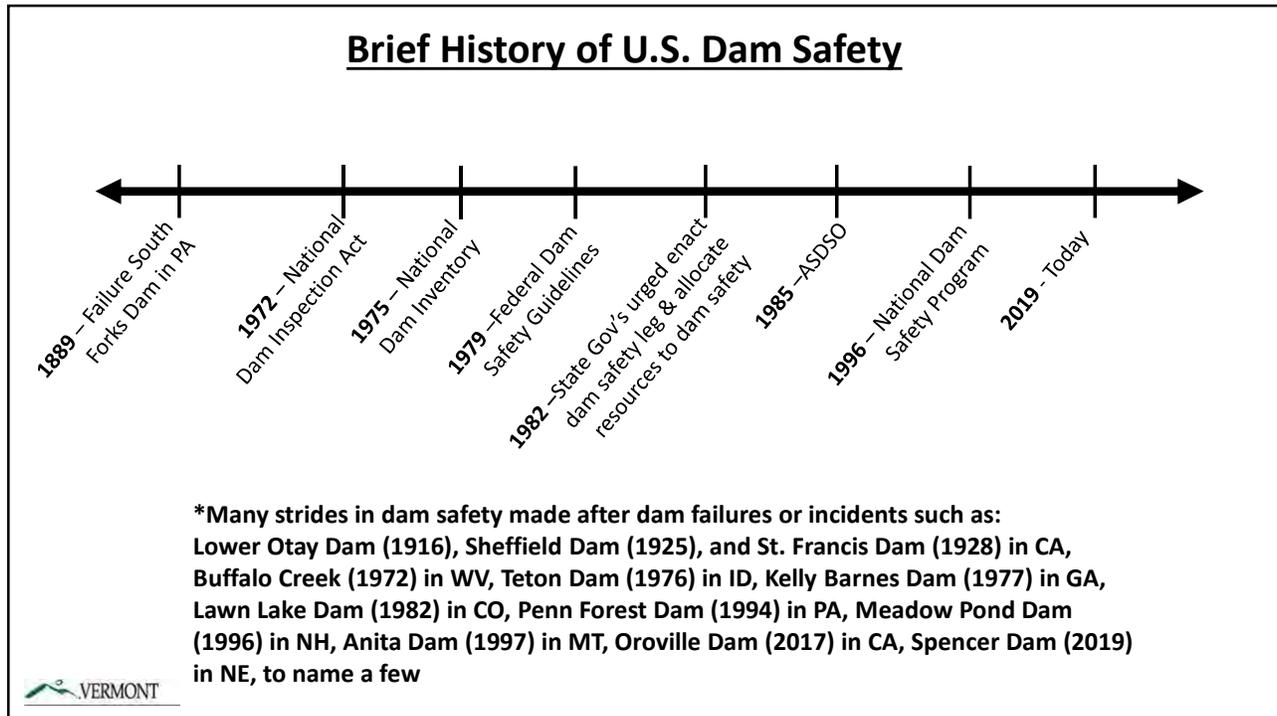
- Introduction
- Dam Safety Program Discussion
- Overview of Chapter 43: Dams
- Dam Inventory, Registration & Inspection Programs, Dam Orders (Permits)
- State Owned Dams
- Review of Draft Administrative Rules
- Questions



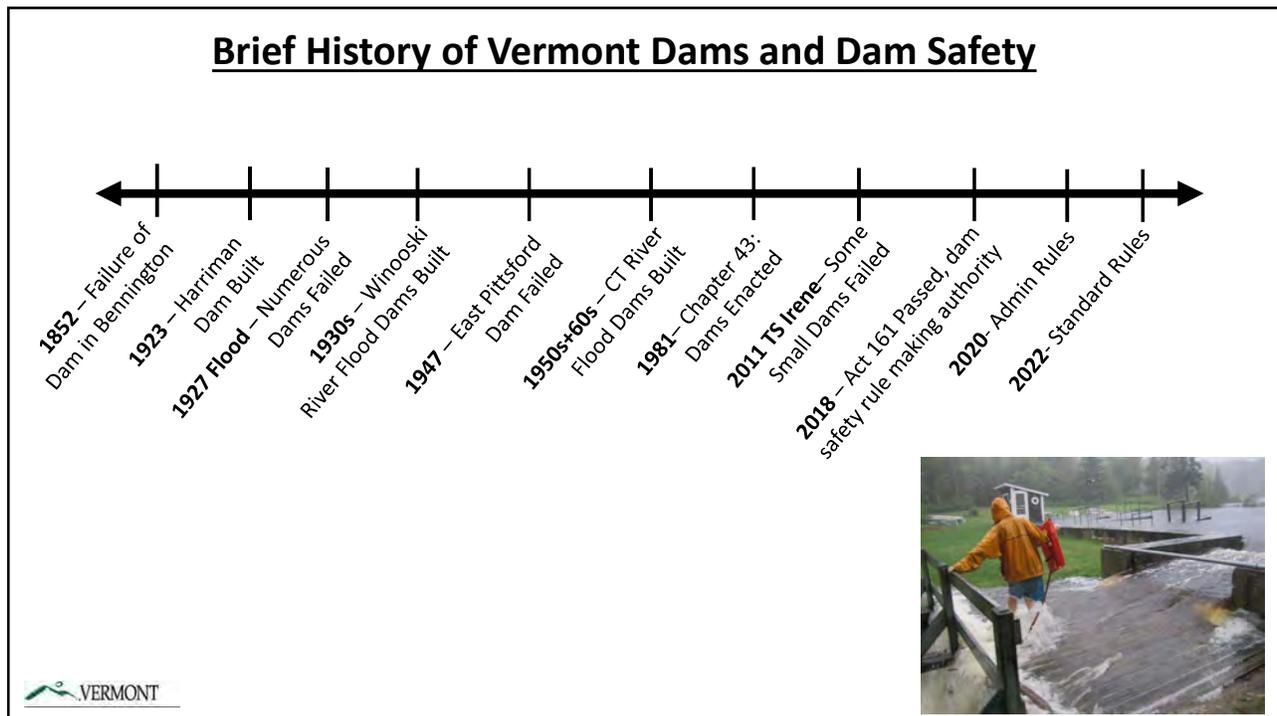
Wrightsville Dam



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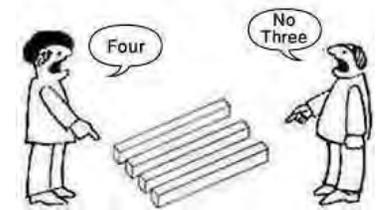


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Regulation of Dams in Vermont

Dams in Vermont regulated by one of four agencies:

1. Department of Environmental Conservation (DEC) = Non-hydropower, non-federal dams at the State Level
2. Public Utility Commission (PUC) = Hydropower Dams Constructed pre-1935 at the State Level
3. Federal Energy Regulatory Commission (FERC) = Hydropower Dams Constructed post 1935 at the Federal Level
4. United States Army Corps of Engineers (USACE) = Dams owned by the Corps or other Federal Entity



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DEC Dam Safety Program Overview

- Located in the Water Investment Division (WID) within the VTDEC
- Full time staff of two engineers, summer intern, and 200 hours of an FED staff member
- Mission different than most divisions within ANR/DEC. ***Primary focus is on Public Safety.***
- Administer 10 V.S.A Chapter 43: Dams
 - Non-federal, non-power dams
- Act as Dam owners, regulators, and engineers



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Chapter 43: Dams

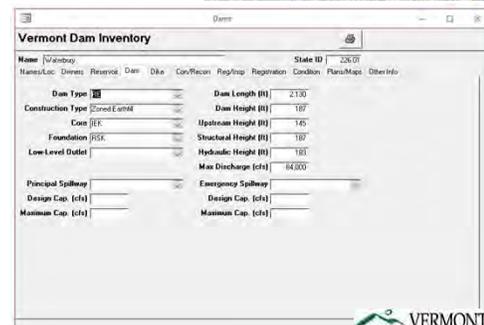
- Legislation that guides regulation of dams at the State level (DEC and PUC)
- Main Takeaways:
 - Basic Definitions
 - Jurisdiction between DEC and PUC
 - Authorization/Permits/Application for dams that impound more than 500,000 cubic feet (about 11.5 acre-feet)
 - Public Good Criteria
 - Dam Inspections
 - Unsafe Dams
- *Recently underwent updates in the 2018 session as Act 161*



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Vermont Dam Inventory (VDI)/Natural Resources Atlas

- ANR Atlas
 - <https://anr.vermont.gov/maps/nr-atlas>
 - Rivers → Dams layer
 - Right click on diamond to bring up attributes
- Contains ~1,100 records (active and historic sites)
- ~413 under full jurisdiction of VTDEC(>500,000 cf)
41 HIGH, 110 SIGNIFICANT, 262 LOW
- ~570 dams under partial DEC Jurisdiction (<500,000 cf)
1 HIGH, 11 SIGNIFICANT, others LOW or not rated
- ~100 PUC / FERC
25 HIGH, 13 SIGNIFICANT, 62 LOW
- **15** other dams are under jurisdiction of Federal Government, including **3 HIGH**



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Registration Program

- Annual fee for Owners of Dams capable of impounding >500,000 cubic feet
 - HIGH hazard Dams = \$1,000
 - SIGNIFICANT hazard Dams = \$350
 - LOW Hazard Dams = \$200
- Fees help to fund Dam Safety Program
- Fee collection allows for regular outreach to owners



Vermont Dam Inventory

Name: Lake Guston State ID: 88.05
 Names/Loc: Owners: Reservoir: Dam: Dike: Cov/Recon: Reg/Insp: Registration: Condition: Plans/Maps: Other Info

Dam Haz Class: Low Annual Fee Required: \$

Fee Type	Submission Number	Payment Reference	Registration Year	Primary Owner ID
Registration	2168195		2016	276
Amount Paid	Date Paid	Payment Type	Paid By	Primary Name
\$200.00	5/18/2016		State of Vermont - I	State of Vermont - DEC
Comments: interagency journal entry transfer				
Fee Type	Submission Number	Payment Reference	Registration Year	Primary Owner ID
Registration	2132972		2017	276
Amount Paid	Date Paid	Payment Type	Paid By	Primary Name
\$300.00	5/26/2017		State of Vermont - I	State of Vermont - DEC
Comments: DNL journal entry				
Fee Type	Submission Number	Payment Reference	Registration Year	Primary Owner ID
Registration				276

Records: 1 of 2 No Filter Search



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Inspection Program

- Visual Dam Safety Inspections by Program Staff
- Opportunity for outreach and education with Owners
- Participation is currently voluntary. Owner permission obtained before performing inspection.
- Dams that impound >500,000 cubic feet currently targeted, although any dam will be inspected upon Owner request.
- ~60 to 100 per year.
- Report generated and forwarded to Owner:
 - Observations/deficiencies, H&H, Stability, EAP, etc.



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Dam Orders (Permits)

- **Authorization/Permits/Application**
 - No person shall construct, enlarge, raise, lower, remodel, reconstruct, ... breach, or alter any dam, pond or impoundment or other structure capable of impounding more than 500,000 cubic feet (11.48 acre-feet) of water or other liquid unless authorized by the State Agency.
- **Application submitted by a Vermont licensed Engineer experienced in Dam Safety Engineering**
- **Required for construction, alterations, rehabilitation, repairs, or removal of dams >500,000 cubic feet.**
- **Public Good Process**
- **Order (Permit)**
 - **General Conditions**
 - **Special Conditions**
 - Includes dam safety, fish & wildlife, and water quality comments (input from other programs).



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Unsafe Dam Proceedings



- **Quasi-judicial process to require dams be repaired or removed to make them safe.**
- **Can be initiated by Dam Safety Program or Public via petition**
- **Followed by an investigation and hearing that results in an Order to the Owner to take action.**
- **Funding assistance available up to \$50,000 (account has ~\$250k)**
 - **Dam Removal = 25% Grant, 75% Loan**
 - **Reconstruction = 100% Loan**
- **Used infrequently (14 times since 1955), program strives to educate and work with owners.**



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State Owned Dams

DEC directly owns 14 (including the 3 flood control dams)

Waterbury Dam: 109 SM drainage area, 187 ft. tall, 2,100 ft. long.

Wrightsville Dam: 68 SM drainage area, 115 ft. tall, 1,525 ft. long.

East Barre Dam: 39 SM drainage area, 65 ft. tall, 1,460 ft. long.

- State owns ~100.
 - F&W (76)
 - FPR (15)
 - VTrans (2)
 - BGS (1)
 - Colleges (6)



Wrightsville Dam, Montpelier/E. Montpelier



East Barre Dam, Barre Town



Great Hosmer Dam, Craftsbury



Wolcott Pond Dam, Wolcott



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Chapter 43: Dams, What's changed?

- Added purpose statement (protect public safety, provide public good)
- Definition of a "Dam"
- Non-Federal, non-power dams to be inspected according to a schedule.
- Assess Hazard Classification of dams (High, Significant, Low, Minimal)
- Dam Inventory be developed, updated and published on ANR Atlas
- Dam owners will be required to register dams in land records
- Person owning legal title/owner of land on which the dam is located
- **Rulemaking (Administrative and Standards)**



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§1110 Rulemaking



Administrative:

- §43-101 Authority
- §43-102 Purpose
- §43-103 Definitions
- §43-104 General Provisions
- §43-105 Applicability
- §43-106 Owner's Liability and Responsibility
- §43-107 Dam Recording in Lands Records
- §43-108 Annual Registration Fee
- §43-109 Hazard Classification
- §43-110 Inspection Schedule
- §43-111 Compliance with Inspection Results
- §43-112 Dam Order
- §43-113 Records
- §43-114 Enforcement Actions
- §43-115 Emergency Action
- §43-116 Severability

Standards:
To be determined

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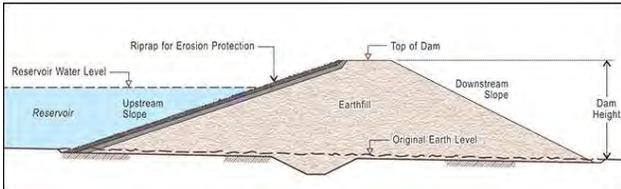
§1110 Rulemaking

Definitions:

“Dam” means any artificial barrier, including its appurtenant works, that is capable of impounding water, other liquids, or accumulated sediments.

A “Dam” includes an artificial barrier that meets all the following:

1. previously was capable of impounding water, other liquids, or accumulated sediments;
2. was partially breached; and
3. has not been properly removed or mitigated.





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Definitions Continued:

A "Dam" shall not mean:

1. barriers or structures created by beaver or any other wild animal.
2. transportation infrastructure that has no normal water storage capacity and that impounds water only during storm events;
3. an artificial barrier at a stormwater management structure that is regulated by the ANR under chapter 47;
4. an underground or elevated tank to store water otherwise regulated by the ANR or an agricultural waste storage facility regulated by the Agency of Agriculture, Food and Markets under 6 V.S.A. chapter 215;
5. Above or below grade tanks, vessels, storage chambers of steel/concrete construction used to store wastewater;
6. Dug ponds created by excavating below grade and constructed without artificial barriers or outlet structures, which pose no threat to life, property, lifelines, or the environment downstream;
7. any structure related to a wastewater treatment facility permitted by the Agency pursuant to 10 V.S.A. § 1263, excluding wastewater ponds and lagoons.
8. Levees, meaning any earthen embankment, floodwall, or structure along a water course whose purpose is flood risk reduction or water conveyance.



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Owner's Liability and Responsibility:

A dam owner is responsible/liable for:

- Safe management and operation of their dam
- Cooperation with the Department and compliance with this Rule.
- Injury to persons or damage to property of others, included but not limited to loss of life resulting from the operation, failure, or mis-operation of a dam.
- the significant financial undertaking required of dam ownership.



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Dam Recording in the Land Records:

- Purpose:
 - inform present and future property owners of the dam on the property and legal responsibilities associated with dam ownership.
- Process:
 - Applies to dams subject to this rule in the Vermont Dam Inventory
 - Required at the Request of Department
 - Within 60 days of request, complete Dam Record Form (owner information, dam information) and return to Department.
 - Multiple Owners = One Dam Record Form per Owner
 - Dam Record Certificate then issued to Owner
 - Owner has 30 days to file in land records and 30 days to provide proof to Department
 - Dam in Multiple Towns = Dam Record Form in Each Town
 - Transfers: Owner shall notify Department of pending transfer. Within 30 days of transfer, new owner shall inform Department, new Dam Record Certification issued



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Hazard Classifications:

- **“Hazard Potential”** potential for adverse incremental consequences that could result from dam failure or mis-operation
- Hazard potential classification based on potential loss of life, damage to property, lifelines, and the environment from dam failure,
- Unrelated to Dam Condition
- Hazard Classification for:
 - identifying potential risks to public safety,
 - establishing inspection schedules, and
 - assuring adherence to design criteria.
- Hazard classification determined by Department and noted in the Dam Inventory.
- Periodically necessary to reclassify dams/evaluate hazard creep



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Hazard Classifications, Continued:

Classification	Proposed General Definition	Existing Definition
HIGH	Dams where failure or mis-operation will probably cause loss of human life. Probably/probable: means more likely than not to occur; expected; realistic.	Dams where failure is expected to cause loss of more than a few lives and excessive damage to homes, industrial or commercial facilities, important public utilities, main highways or railroads. Few: Two inhabited structures, 6 lives
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.	Dams where failure is expected to cause loss of a few lives and appreciable damage to homes, industrial or commercial facilities, secondary highways or railroads.
LOW	Dams where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses.	Dams where failure is not expected to cause loss of life and only minimal property damage.
MINIMAL	A dam that meets the LOW hazard definition, above, but impounds less than 500,000 cubic feet.	Not currently used



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Hazard Classifications, Continued:

Classification	Direct Loss of Life	Lifeline Losses	Property Losses	Environmental Losses
HIGH	Certain (one or more) (extensive downstream residential, commercial, or industrial development)	Not considered for this classification	Not considered for this classification	Not considered for this classification
SIGNIFICANT	None expected	Disruption of essential or critical facilities and access	Major or extensive public and private facilities	Major or extensive mitigation required or impossible to mitigate
LOW	None expected	No disruption of services – repairs are cosmetic or rapidly repairable damage	Private agricultural lands, equipment and isolated buildings, non-major roads.	Minimal incremental damage
MINIMAL	Same as LOW hazard, above			



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Inspection Schedule:

- Dam inspections shall be performed under the supervision of an Engineer. Inspections shall be performed in compliance with Department requirements by the Department or an Engineer hired by the Owner.
- Inspection Types:
 - Periodic: Visual by Department or Engineer hired by the Owner at the frequency described in the table below. In the event Department is unable to perform inspection, shall give Owner 6 months notice to hire an Engineer and complete inspection.

Periodic Inspections	
Hazard Classification	Frequency
HIGH	2 years
SIGNIFICANT	5 years
LOW	10 years
MINIMAL	None

- First inspection under this requirement shall be performed when initiated/required by Department.
- Subsequent inspections shall be performed in compliance with table above.



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Inspection Schedule Continued:

- Inspection Types Continued:
 - Non-Periodic: Inspections performed outside of specified Periodic Inspection interval.
 - may occur at the request of Owner or Individual,
 - may occur following changes in conditions/application of new/different loading conditions.
 - Inventory: Inspection to document configuration of dam for Dam Inventory.
 - Construction: Inspection during construction to observe progress/assess compliance with plans, specifications, Order.
 - Comprehensive: Detailed inspection including studies, investigations, and analyses required to evaluate project risk and safety. Required on 10-year basis for HIGH hazard dams.



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Inspection Schedule Continued:

Individual Inspection Request: An interested person may request Department perform inspection in writing, must provide:

- Location
- Owner contract information
- Statement explaining why dam should be inspected

The Department shall review request, determine if inspection is required, and proceed accordingly.

Department Permission for Entry for Inspections: Owners shall allow Department access at reasonable times. If owner does not permit access, Department may apply for access order.



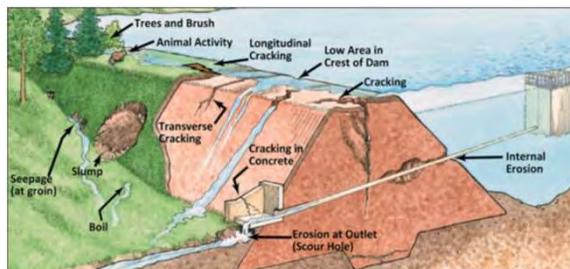
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Compliance with Inspection Results:

- If, based on inspection, Department determines maintenance, investigation and analysis, or repairs or reconstruction to a dam are needed to maintain dam in safe condition, Department shall notify Owner in writing and require work undertaken within the time period specified.
- If Owner does not strive to undertake required work, Department may bring enforcement and or require Owner to drain reservoir and maintain it drained until necessary work has been completed.



Source: FEMA P-911



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Emergency Action:

- Dam owners have primary responsibility for determining when an emergency involving their dam exists.
- Owner shall immediately implement Emergency Action Plan (if applicable), and take necessary actions to safeguard life, property, lifelines, and environment.
- If necessary action not being taken by Owner, Department has authority to take action if not sufficient time for enforcement.
- Department shall maintain full control over dam until it is rendered safe or the emergency has ceased.
- Departments' "take-over" of dam shall not relieve Owner's legal liability.
- Departments' assumption of control over dam shall not constitute a taking and Department shall not be liable for diminution in property value.
- Department may choose to recover costs of actions from Owner.



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Thank you!
Questions?

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Wrightsville Reservoir

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