Hydroelectric Permitting
Environmental and Safety Overview

A. Overview

- There are 1217 inventoried dams in Vermont.
- 519 of these are dams capable of impounding more than 500,000 cubic feet or 3,740,000 gallons.
  - This size dam is regulated under 10 V.S.A. Ch. 43 and requires authorization to construct, alter, or remove.
- 437 of the 519 are under jurisdiction of the Department of Environmental Conservation (DEC).
- 79 of the 519 are under the jurisdiction of the Public Service Board as dams or projects that relate to or are incident to generation of electric energy for public use or as part of a public utility.
- 3 of the 519 are under the jurisdiction of the Natural Resource Conservation Districts as agricultural dams.

	Loss of Life	**Economic Loss**	**DEC Dams**	**Inspection**
High Hazard	More than a few	Excessive (Extensive community, industry or agriculture)	39	Annually
Significant Hazard	Few (No urban developments and no more than a small number of inhabitable structures)	Appreciable (Notable agriculture, industry or structures)	113	Every 3 to 5 years
Low Hazard	None expected (No permanent structures for human habitation)	Minimal (Undeveloped to occasional structures or agriculture)	285	Every 5 to 10 years

- Of the 437 DEC dams, the State of Vermont owns 85—8 are high hazard.
  - ANR 84 – 58 DFW, 14 DEC, 10 FPR.
  - AOT 2.
  - State College System 1.
- Municipalities own 78 dams—20 are high hazard.
- The remaining 274 owned by: Ski areas, Individuals, Foundations or Trusts, Trout Clubs, Homeowner Associations, and Fire Districts.

B. Dam Safety

- Term "dam" is not defined in statute or DEC rule.

- PSB Rules define "Dam" as any barrier (including its appurtenant structures and adjacent supporting natural features) constructed across a waterway to control the flow or raise the level of water, or behind which water is impounded or pumped for later release, over which the Board has jurisdiction pursuant to Chapter 43 of Title 10 of Vermont Statutes Annotated.

- In drafting bills over the past several years, definition has been proposed:

  "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:

  (i) previously was capable of impounding water or other liquids;

  (ii) was partially breached; and

  (iii) has not been properly removed or mitigated.

  (B) "Dam" shall not mean:

  (i) barriers or structures created by beaver or any other wild animal as that term is defined in section 4001 of this title;

  (ii) a highway culvert;

  (iii) an artificial barrier at a stormwater management structure that is regulated by the Agency of Natural Resources under chapter 47 of this title;

  (iv) underground or elevated tanks to store water otherwise regulated by the Agency of Natural Resources;

  (v) an agricultural waste storage facility regulated by the Agency of Agriculture, Food and Markets under 6 V.S.A. chapter 215; or

  (vi) any other structure identified by the Department by rule.

- Dams capable of impounding more than 500,000 cubic feet or 3,740,000 gallons require a permit from DEC or PSB to construct, enlarge, raise, lower, remodel, reconstruct, or otherwise alter any dam, pond or impoundment or other structure.

- The State agency having jurisdiction shall employ an engineer to make periodic inspections of nonfederal dams in the State to determine their condition and the extent, if any, to which they pose a potential or actual threat to life and property.

- Agency of jurisdiction shall have an engineer investigate the safety of a dam if petitioned by 10 or more persons or a municipality or if the agency so chooses.

- If the agency finds that the dam or portion of the dam as maintained or operated is unsafe or is a menace to people or property above or below the dam, it shall issue an order directing reconstruction, repair, removal, breaching, draining or other action it considers necessary to make the dam safe.

- The Vermont Unsafe Dam Revolving Loan Fund exists to provide grants and loans to municipalities, nonprofit entities, and private individuals for the reconstruction, repair, removal, breaching, draining, or other action necessary to reduce the threat of a dam or portion of a dam.

C. Environmental Review—Vermont Water Quality Standards and Clean Water Act § 401

- Under CWA § 303, all states shall adopt water quality standards for waters within the state.
  - The CWA requires states to review and amend the water quality standards every 3 years.
- Under State law, 10 V.S.A. §§ 1252 and 1253, the waters of the State are classified according to their quality and the uses they support.
- The CWA-required water quality standards must be designed to achieve the purposes of the water classifications—i.e to support the uses of the water.
- The majority of Vermont waters are classified as Class B waters by statute.
  - Statute provides that Class B waters are waters suitable for: bathing and recreation; irrigation and agricultural uses; good fish habitat; good aesthetic value; acceptable for public water supply with filtration and disinfection.
- CWA § 401 requires an applicant for a federal license or permit for an activity that may result in a discharge to a navigable water to provide the licensing or permitting agency a certificate from the State that the discharge will comply with the CWA.
- The state certificate must provide that the proposed discharge complies with the VWQS, water quality effluent limitations, and national standards of performance.
  - A state CWA § 401 certification shall include conditions necessary to ensure the water quality standards are met.
- A state CWA § 401 certification becomes a condition of a relevant federal license or permit.
  - No federal license or permit that involves a discharge to state waters may be granted until the CWA § 401 certification has been obtained or has been waived.
- The Federal Power Act (FPA) governs construction, licensing, and operation of hydroelectric projects.
  - The Federal Energy Regulatory Commission (FERC) administers the FPA and issues licenses and exemptions under the act.
- Under the FPA, a license or exemption is required to construct, operate, and maintain a hydroelectric project that is located on navigable U.S. waters, occupies U.S. land, uses surplus water from a federal dam, or is located on a water used in interstate commerce.
- Any FERC issued license or exemption must obtain a CWA § 401 certification from ANR when the license or exemption is issued or renewed.
- Many FERC licenses have long terms—up to 40 years—and many of the hydroelectric projects predate the existing Vermont Water Quality Standards.
- As the license terms of hydroelectric projects in Vermont expire and the operators seek renewal, many projects will be undergoing CWA § 401 review for the first time.
  - Many of dams in Vermont are approaching the time when their permits will need renewal.

D. VWQS Hydrology Policy and Aquatic Biota Criteria

Hydrology Policy

- The VWQS include a Hydrology Policy that provides that the proper management of water resources now and for the future requires careful consideration of the interruption of the natural flow regime and the fluctuation of water levels resulting from the construction of new, and the operation of existing, dams, diversions, and other control structures.

- These [VWQS] in conjunction with other applicable law, provide a means for determining conditions which preserve, to the extent practicable, the natural flow regime of waters.

- In order to effectively implement the VWQS hydrology policy and to ensure full support of uses, the VWQS provides hydrology criteria to be achieved and maintained where applicable.

- The Hydrology Criteria for Class B waters provides the following:
    - Any change from the natural flow regime shall provide for maintenance of flow characteristics that ensure the full support of uses and comply with the applicable water quality criteria.

- When the Hydrology Policy and Criteria are read together, the VWQS contemplate that ANR will review the operation of existing dams to "consider" their interruption of the natural flow.
    - If the natural flow is altered, the flow characteristics must maintain "full support" of all uses.

- Because hydroelectric projects usually, intentionally interrupt the natural flow of a water, it is often difficult to determine conditions that preserve natural flow in a way that ensures full support of all uses while also allowing for economical operation of the hydroelectric project—i.e. the dam may need to reduce the amount of water flowing through its turbines.

Aquatic Biota Criteria

- Where this requirement often is most challenging is in ensuring the full support of aquatic biota.

- The VWQS include a policy statement that provides, in part, that it is the policy of the State to assure the maintenance of water quality necessary to sustain existing aquatic communities.

- The VWQS require that Class B waters shall be managed to achieve and maintain a level of quality that fully supports designated uses, including aquatic biota, wildlife, and aquatic habitat.

- The VWQS then provide that the following specific criteria for aquatic biota, wildlife, and aquatic habitat shall be met in Class B waters:
    - No change from the reference condition that would prevent the full support of aquatic biota, wildlife, or aquatic habitat uses.

- Reference condition means the range of chemical, physical, and biological characteristics of waters minimally affected by human influences.

- Thus, in a Class B water, with no additional classification, a project must not prevent the full support of aquatic biota as if the biota were in a water minimally affected by human influences.

- This may be difficult for hydroelectric projects to achieve.